



29/2014

Evaluation of Participatory Tools

Case Study about *Participatory Technology Development* (PTD)
in Central India

Yvonne Zahumensky



Herausgeber GSWP

Prof. Dr. Sebastian Kinder • Prof. Dr. Rainer Rothfuß • Jun.-Doz. Dr. Timo Sedelmeier •
Dr. Gerhard Halder

Eingereicht als Diplomarbeit am 1.10.2013

Erstbetreuer: Prof. Dr. Rainer Rothfuß

Zweitbetreuerin: Dr. Christina Alff

Herausgeber GSWP

Prof. Dr. Sebastian Kinder • Prof. Dr. Rainer Rothfuß • Jun.-Doz. Dr. Timo Sedelmeier •
Dr. Gerhard Halder

i. Acknowledgements

The present investigations were conducted during an internship in the context of the project "Farming Systems Comparison in the Tropics", implemented by the RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL), in close cooperation with the local project partner bioRe® INDIA LTD./ bioRe® ASSOCIATION, that are part of the bioRe® foundation of the Swiss trading company REMEI AG. The project is funded by BIOVISION FOUNDATION, the COOP SUSTAINABILITY FUND, the LIECHTENSTEIN DEVELOPMENT SERVICE (LED) and the SWISS AGENCY FOR DEVELOPMENT AND COOPERATION (SDC). Data collection was realized in the *Participatory Technology Development* (PTD) component of the project in Kasrawad, Madhya Pradesh state, India.

I am indebted to my supervisor during the FiBL-internship, Dr. DIONYS FORSTER, who always provided great support, scientific advice, patience and encouragement beyond the standard requirements.

I express deepest thanks to the research staff from bioRe® Association, who continuously offered their personal and professional advice with patience and warmth, especially Mr. RAJEEV VERMA and Mr. LOKENDRA SINGH MANDLOI.

I also express my sincere thanks to the CEO at bioRe® India Ltd. and bioRe Association, Mr. VIVEK RAWAL, and the former CEO at bioRe® India Ltd., Mr. RAJEEV BARUAH, and his wife RITU BARUAH, former CEO at bioRe® association, from whom I always was met with great hospitality.

I also owe special thanks to The CEO at REMEI AG, Mr. PATRICK HOHMANN, and to Dr. CHRISTINA ALFF from the DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT (GIZ), who spent some of their precious time for expert interviews.

I am very grateful to Professor Dr. RAINER ROTHFUß from Tübingen University for his motivating support during the working out of this paper.

Last but not least, I thank my family and friends who always supported me and drew my attention to the basics: my daughter, EVELYN, my parents, JAROMIR and MARION ZAHUMENSKY, my friends, CARLA HORLACHER-HARTUNG and ANDREJ HARTUNG, SVEA OBERMAIER, BETTINA REIßER, CAROLIN SHERIDAN, and SONJA BITTMANN.

ii. Abstract

Participation is an important keyword especially in development practice and in agricultural research, since it entails great potential for the initiation of broad social change, empowerment, ownership and active engagement of marginal and disadvantaged people. Participatory methodology is assumed to facilitate participation processes and the motivation for participation. Yet, there is little evidence of the impacts of participatory tools on individuals with regard to the stimulation of motivation for participation.

The empirical investigations of this paper give evidence to the impacts of participatory methods on the base of a case study with Indian organic cotton farmers in the context of a *Participatory Technology Development* (PTD) project in Central India. Selected participatory PTD-tools are assessed through a mix of inquiry methods in order to gather information about the direct effects of PTD-tools on individual's motivation degrees.

However, the very common perception that participatory tools are beneficial per se is fundamentally questioned due to the tools' high susceptibility to misuse and malfunctions. Hence, the continuous critical reflection of participatory tools and philosophy is required in order to avoid a rhetoric use of participation during development or research activities. A qualitative and a quantitative evaluation of participatory PTD-tools that were applied in the course of the case study reflect how local farmers are motivated. Such information is the basis for a purposful use of participatory tools such as for instance the stimulation of degrees of motivation for pro-active participation.

CONTENTS

i. Acknowledgements 1
ii. Abstract 2

(I) INTRODUCTION

iii. Context of origin of this work 11
iv. Research questions(s) and difficulties 13
v. Research approach 14

(II) THEORETICAL PART

1. Development and Underdevelopment 18
 1.1 Development 19
 1.2 Underdevelopment..... 21
 1.3 Chronology of (under)development..... 22
 1.4 Critiques on development: 'dialectic without synthesis'..... 33
Summary Chapter 1 35

2. Post-development 36
 2.1 Discourse analysis 37
 2.2 Post-development critiques on conventional development strategies 38
 2.3 Objectives of post-development 43
 2.4 Critical considerations on post-development critiques 43
 2.5 Potentials of post-development critique: radical democracy 46
Summary Chapter 2 47

3. Participation 48
 3.1 Chronology of participation 49
 3.2 Dimensions of participation 50
 3.3 Objectives of participation 56
 3.4 Constraints of participation and participatory methods (PMs) 59
 3.5 *Participatory (Action) Research (P(A)R)* 63
 3.6 *Participatory Agricultural Research (PaR)* 66
 3.7 *Participatory Technology Development (PTD)*..... 70
Summary Chapter 3 80

4. Motivation	83
4.1 Motivation as an interplay of directed forces and as rational calculation	85
4.2 Achievement motivation	88
4.3 <i>Achievement Motivation Inventory</i> (AMI)	92
Summary Chapter 4	93

(III) EMPIRICAL PART

5. Case Study	96
5.1 Case study approach.....	96
5.2 Research region	97
5.3 FiBL/ bioRe research in India	110
5.4 Research questions, methodology and hypotheses of the case study	113
5.5 Target groups of the case study	115
5.6 Objectives of the case study.....	117
5.7 Methods of the case study	118
6. Results	125
6.1 Capacity building	125
6.2 Participatory evaluation of PTD-tools (qualitative evaluation).....	129
Summary Chapter 6.2	169
6.3 Evaluation of motivation degrees (quantitative evaluation)	171
Summary Chapter 6.3	231
7. Discussion of results	237
7.1 Discussing the capacity building	237
7.2 Discussing the participatory evaluation of PTD-tools (qualitative evaluation)	238
7.3 Discussing the evaluation of motivation degrees (quantitative evaluation)	247
7.4 Discussing the results against the backdrop of post-development criticism	255
Summary Chapter 7	266
8. Recommendations	268
8.1 Recommendations for bioRe India Ltd., bioRe Association India, and REMEI AG	268
8.2 Recommendations for the RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL).....	270
8.3 Scientific Recommendations	273
9. Conclusion	275
10. Bibliography	276

List of figures

Figure 1: Research approach	14
Figure 2: Complementary triangulation	15
Figure 3: Hexagon of development policy.....	20
Figure 4: The hexagon of development	21
Figure 5: Four-Level Strategy of Intervention	32
Figure 6: Purposes, motives, and stages of participation in development	51
Figure 7: Participation levels and continuums	53
Figure 8: Line of participation intensity (scopes of <i>ownership</i>) in 5 scenarios	54
Figure 9: Types of <i>On-farm Research</i> (OFR)	70
Figure 10: Joint experimentation in OFR.....	72
Figure 11: The tools of PTD	73
Figure 12: The PTD process in a "Forages for Smallholders" project.....	74
Figure 13: PTD-activities.....	75
Figure 14: Synergy of personal and situational factors during the originating process of motivation. 86	
Figure 15: Onion Skin Model of Achievement Motivation.....	89
Figure 16: The villages <i>Amlatha, Badi, Choli, and Nimrani</i> in district <i>Khargone</i>	98
Figure 17: Output of agriculture and allied sectors 2009-10 (in %)	105
Figure 18: Average size of holdings as per different Agriculture Censuses 1970-2011	106
Figure 19: Number of holdings as per different Agriculture Censuses 1970-2011.....	106
Figure 20: Innovation cycle.....	112
Figure 21: Mother-baby trial concept	112
Figure 22: Theoretical categorization of bioRe organic farmers according to motivation degrees ...	115
Figure 23: Ad hoc categorization of bioRe organic PTD-farmers	116
Figure 24: Ad-hoc control group of bioRe organic non-PTD farmers.....	117
Figure 25: Codification of response scale of the standardized questionnaire about motivation	124
Figure 26: Grouping of <i>basic groups</i> of investigation to de facto <i>workshop groups</i>	129
Figure 27: <i>Points evaluation</i> - WS 1 in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers)	135
Figure 28: <i>Points evaluation</i> - WS 1 in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	139
Figure 29: <i>Points evaluation</i> - WS 1 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	143
Figure 30: <i>Points evaluation</i> - WS 2 in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers)	148
Figure 31: <i>Points evaluation</i> - WS 2 in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	152
Figure 32: <i>Points evaluation</i> - WS 2 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	157
Figure 33: Comparison of <i>points evaluations</i> - <i>Final workshop</i> in <i>workshop group 1 +2 (Amlatha and Choli PTD-farmers)</i>	162
Figure 34: Comparison of <i>points evaluation</i> – <i>Final workshop</i> in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	164
Figure 35: Comparison <i>points evaluation</i> – <i>Final workshop</i> in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	168

Figure 36: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	174
Figure 37: Comparison of mean facet scores of 'basic motivation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	176
Figure 38: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	178
Figure 39: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	179
Figure 40: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 2 (Choli PTD-farmers)</i>	181
Figure 41: Comparison of mean facet scores of 'basic motivation' in <i>basic group 2 (Choli PTD-farmers)</i>	182
Figure 42: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 2 (Choli PTD-farmers)</i>	183
Figure 43: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 2 (Choli PTD-farmers)</i>	184
Figure 44: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 3 (Badi PTD-farmers)</i>	186
Figure 45: Comparison of mean facet scores of 'basic motivation' in <i>basic group 3 (Badi PTD-farmers)</i>	187
Figure 46: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 3 (Badi PTD-farmers)</i>	189
Figure 47: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 3 (Badi PTD-farmers)</i>	190
Figure 48: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	191
Figure 49: Comparison of mean facet scores of 'basic motivation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	192
Figure 50: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	194
Figure 51: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	195
Figure 52: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	197
Figure 53: Comparison of mean facet scores of 'basic motivation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	198
Figure 54: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	199

Figure 55: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	200
Figure 56: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	202
Figure 57: Comparison of mean facet scores of 'basic motivation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	203
Figure 58: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	204
Figure 59: Comparison of mean facet scores of 'motivation for participation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	206
Figure 60: Comparison of total mean scores of questionnaire part I 'basic motivation' (all investigated groups).....	212
Figure 61: Comparison of total mean scores of questionnaire part II 'motivation for participation' (all investigated groups).....	216
Figure 62: Comparison of total mean scores questionnaire part I and II 'total motivation' (all investigated groups).....	221
Figure 63: Actual categorization of bioRe organic farmers according to total motivation degrees...	223
Figure 64: Facet scores part III ('self-evaluation basic motivation') of <i>basic group 1 (Amlatha PTD-farmers)</i>	225
Figure 65: Facet scores part III ('self-evaluation basic motivation') of <i>basic group 2 (Choli PTD-farmers)</i>	226
Figure 66: Facet scores part III ('self-evaluation basic motivation') of <i>basic group 3 (Badi PTD-farmers)</i>	227
Figure 67: Facet scores part III ('self-evaluation basic motivation') of <i>basic group 4 (Nimrani PTD-farmers)</i>	228
Figure 68: Facet scores part III ('self-evaluation basic motivation ') of <i>basic group 5 (Choli non-PTD-farmers)</i>	229
Figure 69: Facet scores part III ('self-evaluation basic motivation') of <i>basic group 6 (Nimrani non-PTD-farmers)</i>	230
Figure 70: Catch question of the basic motivation facet <i>Flexibility</i>	248
Figure 71: Project participation in the FiBL/ bioRe PTD-project	272

List of tables

Table 1: Common principles underlying participatory approaches	55
Table 2: Ways of empowerment.....	57
Table 3: Types of On-Farm Research (OFR).....	69
Table 4: Selected emphases of participation for the case study of this paper	81
Table 5: Levels of education in India in 2005/ 06 (NFHS-3) (Educational attainment of household population, % distribution).....	102

Table 6: Proportions of literacy rates in nation state, federal state and district 2011 (in %)	103
Table 7: <i>Madhya Pradesh's</i> (M. P.) share in national agricultural production 2002/ 2010	107
Table 8: Sequence of applied participatory tools during the PTD-workshops.....	119
Table 9: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	174
Table 10: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 1 (Amlatha PTD-farmers)</i>	177
Table 11: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 2 (Choli PTD-farmers)</i>	180
Table 12: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 2 (Choli PTD-farmers)</i>	183
Table 13: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 3 (Badi PTD-farmers)</i>	185
Table 14: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 3 (Badi PTD-farmers)</i>	188
Table 15: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	191
Table 16: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 4 (Nimrani PTD-farmers)</i>	193
Table 17: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	196
Table 18: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 5 (Choli non-PTD-farmers)</i>	199
Table 19: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	201
Table 20: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in <i>basic group 6 (Nimrani non-PTD-farmers)</i>	204
Table 21: Comparison of differences in total scores of the pre- and post-surveys per <i>basic group</i> and per questionnaire part (rounded scores)	231
Table 22: Frequency of maximum scores in pre- and post-survey of questionnaire part III 'self- evaluation basic motivation'	253

List of Images

Image 1: <i>Test workshop 1</i> with elderly farmers of <i>Choli</i> village.....	126
Image 2: <i>Test workshop 2</i> with bioRe agricultural extensionists (consultants).....	128
Image 3: <i>SWOT-Analysis - WS 1</i> in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers).....	131
Image 4: <i>Pairwise Ranking - WS 1</i> in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers)	133
Image 5: <i>Expectations Matrix - WS 1</i> in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	136
Image 6: <i>Matrix Ranking - WS 1</i> in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers).....	138

Image 7: <i>Historical Diagram</i> - WS 1 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers).....	140
Image 8: <i>Scenario/ Expectations Matrix</i> - WS 1 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)..	142
Image 9: <i>Exchange Visit/ Field Visit</i> - WS 2 in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers).....	145
Image 10: <i>Observation Matrix</i> - WS 2 in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers)	145
Image 11: <i>Impact Diagram</i> - WS 2 in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers).....	147
Image 12: <i>Group Field Observation</i> - WS 2 in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	149
Image 13: <i>Matrix Ranking</i> - WS 2 in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers).....	151
Image 14: <i>Transect Walk</i> - WS 2 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	153
Image 15: <i>Outcome of the Transect Walk</i> - WS 2 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	154
Image 16: <i>Impact Diagram 'organic farming'</i> - WS 2 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	155
Image 17: <i>Impact Diagram 'conventional/ GMO farming'</i> - WS 2 in WSG 5+6 (<i>Choli</i> and <i>Nimrani</i> non-PTD-farmers)	156
Image 18: <i>PTD-Exposition - Final workshop</i> in WSG 1 - 4 (all PTD-farmers)	158
Image 19: <i>Points evaluation and results - Final workshop</i> in WSG 1+2 (<i>Amlatha</i> and <i>Choli</i> PTD-farmers)	161
Image 20: <i>Points evaluation and results - Final workshop</i> in WSG 3+4 (<i>Badi</i> and <i>Nimrani</i> PTD-farmers)	163
Image 21: <i>Points evaluation - Final workshop</i> in WSG 5 (<i>Choli</i> non-PTD-farmers)	166
Image 22: <i>Points evaluation and results - Final workshop</i> in WSG 6 (<i>Nimrani</i> non-PTD-farmers)	167

(I) INTRODUCTION

iii. Context of origin of this work

– Why participation?

Participation basically means taking part or sharing. In the context of development it goes further asking who shares, with whom, and in what context (SAMARANAYAKE 1996: 46). In doing so, participation becomes more complex and difficult to assess. Despite its complex interplays participation is an omnipresent keyword in development studies and often taken as a pre-conceived objective mainly in project planning. In the past, some even spoke of a paradigm shift to participatory development but in practice participation remains a question of interpretation. The interpretation ranges from using it as a label to legitimate any development activity to describing an empowering process that motivates local people for self-confidence, self-determination, self-organization, and self-responsibility. The latter corresponds best with essential development objectives. However, participation meaning and application differs considerably until today so that there is still a need to clarify the scope of meanings of participation. This is especially relevant in developmental contexts since development itself encompasses a range of concepts and varying action approaches.

Moreover, through the mainstream application of participation methodologies unexpected conceptual and methodological problems have arisen. Since the end of the 1990s participation has experienced one-sided methodology-oriented application neglecting its political dimension of empowerment. Besides, paradoxes of participation emerged recently: approaches experienced methodological standardization contradicting the original claims for flexible and context-specific approaches. (KANJI & GREENWOOD 2001: 8) For this reason, a revision and the evaluation of participatory methodologies or tools appear necessary. This is a difficult task since there is also still a need to identify methods for evaluating participation and its impacts on individual level.

Last but not least, the author of this research study has a personal interest in participation topics since, in 2005, she encountered participatory methods during an internship in a PPG7-subproject in cooperation with the formerly DEUTSCHE GESELLSCHAFT FÜR TECHNISCHE ZUSAMMENARBEIT (GTZ) in Belém, Brazil. Since then, she laid her main research interest on participation issues.

– Why India?

India is the 7th largest country of the world (GOVERNMENT OF INDIA 2013) and with a total population of more than 1.2 billion people in 2011 (UNDP 2011) it can be denominated as the 'largest democracy' or 'the most populous democracy' since India's population total is superseded only by China (GOVERNMENT OF INDIA 2011a: 39). For decades India was characterized as a country of poverty, an adamant hierarchical caste system, lack of rights, and widespread child labor. Yet, since the 1990s India experienced an unprecedented

economic boom. Since then, it represents a world nuclear power that is famous for its export hit of skilled software engineers. (WOYKE 2008: 5ff.; TIRTHA 2002: 17ff.)

Today, India represents a subcontinent fraught with contradictions between modernization and still existing archaic agricultural manufacturing practices, and between rich and poor. Despite the economic boom, 75.6 % of Indian population (2004-2005) (WORLD BANK 2011: 394) is living below the international poverty level having less than \$2 per day at their disposal; 41.6 % (2005) is even living below the international poverty line of \$1.25 per day. For the survival of the poor, (subsistence) agriculture is still a corner stone of Indian economy. Although the proportion of the agricultural sector on total value decreases (1991: 29 %; 2001: 23 %; 2011: 18 %) (WORLDBANK 2013a) agricultural sector's proportion of value added accounts for 18 % (2009) (WORLD BANK 2011: 398). Not only for economy, but especially in the light of India's political system, democratization, decentralization processes, and peasantry played an important role in the last century. It was the famous struggle for freedom from colonial rule by Indian farmers that made Indian democracy and federalism flourishing. Due to the struggle for democracy, Indian citizens show a high degree of political participation and political awareness (KUHN 1998: 4). Yet, political culture and the level of activism of civil society forces significantly vary across regions, castes, religions and social classes (KUHN 1998: 5). However, it is the poor and especially the lower castes that seem to be more interested in (political) participation and who show a rising political interest (SHASTRI & WILSON 2001: 29). India's contradictory socio-political situation increases the interest for a case study about potentials and constraints of participatory tools to stimulate motivation for participation especially among the rural poor.

– **The specific contribution of development geography**

The contribution of development geography to development research lies in its subject-specific tradition of having the 'regional competence' to conduct empirical studies about specific, often small-scale processes. However, development geography has difficulties in pointing out its specific theoretical and practical contribution to development theory and research. (cf. COY 2000: 50; SCHOLZ 2004: 21f) The present case study is far from delivering a geographical theory or concept to remedy this problem. Though, at least, it is embedded in a broad multidimensional conceptual discussion about participation in development, and it intends to scaling-up findings from the case study. For this purpose, the research study goes an unusual way. It is not new to investigate participatory methods on community or group level but it is unusual to investigate participation on individual level. In this work the angle of view will be narrowed to the individual level of participation for development since development is considered to be initiated by human resources, i.e. it is activated in the head of every individual.

One beneficial aspect of development geography is taken as a basis for analysis: geography's major objective of conducting multidisciplinary research. This is of great interest

and necessity in development studies since social development is a multidimensional process. It is not the struggle of different specialized disciplines for the sole appropriate approach that helps along, but it is only the attempt of a synthesis. Such a synthesis is a discipline-specific core objective of development geography. (cf. RAUCH 2009: 122f; COY 2000: 50) By the end of the geographic case study, the author intends to make a contribution to the evaluation of participatory tools on individual level, to the sustainable and appropriate use of participatory tools at least in the research region, and to a mutual learning process of *all* persons involved.

iv. Research questions and difficulties

Participatory development and research base on the pro-active involvement of local target groups. Theoretically, there are existing lots of instructions for the stimulation of active participation of local people but there is no universal magic formula. Thus, in practice, pro-active participation often does not occur in the expected way. For this reason, the Swiss RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL) ordered a research study in the context of its participatory research project activities in India asking '*How can local farmers be motivated to participate in the local PTD-project¹? Which methods are suitable to motivate them for active participation?*'

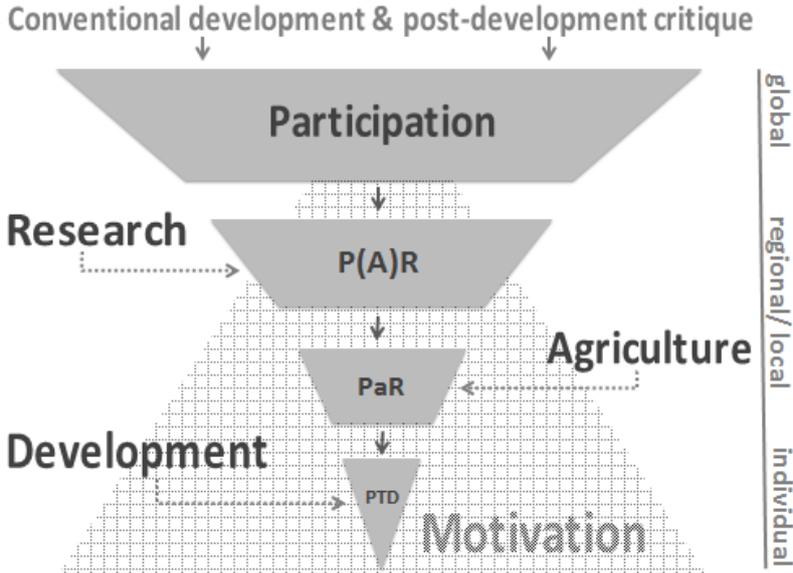
Answering these research questions was accompanied by fundamental doubts on participation and development per se: '*What if local people are not interested in participating? Is it possible that the promotion of active participation of farmers in an activity they might not be interested in might be the imposition of an external development idea? Do farmers want to develop themselves or to research at all? Who benefits from participatory research at the end? Who does the FiBL want to benefit in the first instance? How participatory is the research at all?*' Apart from the fundamental difficulties with participatory approaches the following investigations faced other concrete difficulties regarding the methodological realization of an evaluation of participatory tools. Besides the problem of retracing direct correlations between applied participatory tools and the motivation degree of participating farmers, the measurement of motivation for active participation amongst farmers represents a major difficulty that required a creative handling with research methods, particularly the innovative linkage of psychology topics with agricultural research and development topics. Exploring something that has rarely been investigated before is challenging, requires unconventional approaches and improvised mix of methods.

¹ *Participatory Technology Development (PTD)* is a form of *Participatory Agricultural Research* with the intense involvement of local farmers in the research process. At FiBL, this participatory on-farm research is conducted in concert with formal long-term research on field trials where different farming systems are compared with the objective to compare the performance of conventional and organic agricultural production systems. (cf. FiBL 2011a; FiBL 2011b)

v. Research approach

This study is truly geographic in the sense of pursuing a multidimensional scientific strategy of covering a topic: it is a *'multi-level-multi-disciplinary-multi-methods-study'*. First of all, it involves a variety of topics. It refers to development, and especially to post-development critiques, to participation, to motivation, to agriculture, and to *Participatory Technology Development* (PTD) at the interface of all these topics. Epistemologically, it includes social-science and natural science approaches, as well as a humanistic approach to the process of knowledge acquisition (hermeneutics). Methodologically, this survey includes a quantitative inquiry as well as a range of (semi)-qualitative methods. Furthermore, it considers various spatial scales, from global to individual level. Due to this complexity, the theoretical part comprises all relevant topics with the objective to narrow the focus towards participation as the core topic. In doing so, the angle of view will be narrowed gradually and with a certain logic rigor from a very global and general perspective of development to the individual level of motivation for participation (see figure 1)

Figure 1: Research approach



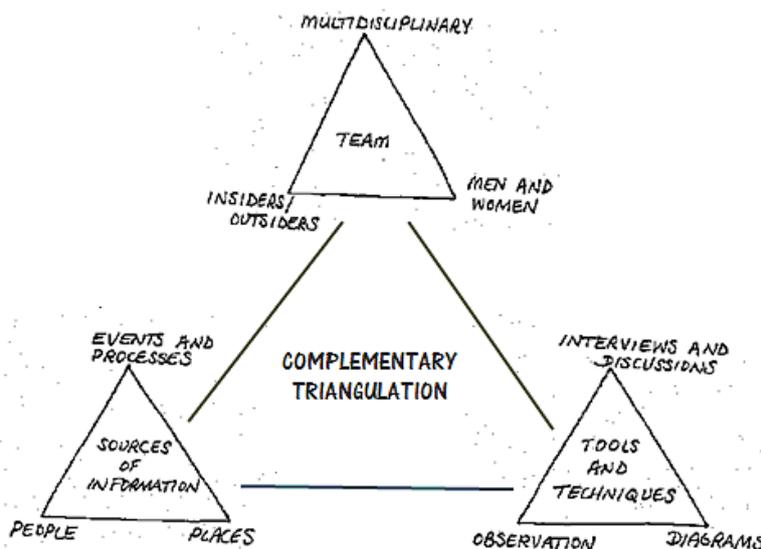
Source: ZAHUMENSKY 2013

P(A)R = *Participatory (Action) Research*; PaR = *Participatory Agricultural Research*; PTD = *Participatory Technology Development*

In view of such multidimensionality no other analysis technique than triangulation appears more appropriate for the cross-checking of results. Yet, in this paper, this form of cross-checking involves very complex processes, because triangulation is undertaken for different purposes (validation of methods vs. obtaining deeper understanding), in different

ways (between methods vs. within methods²), in different forms (triangulation of data/resources vs. methodological triangulation), and including different investigators (insiders vs. outsiders; social scientists vs. natural scientist vs. lay people; men vs. women). (cf. BOHNSACK et al. 2006: 161) This complexity allows for comprehensive and multilayered insights into the research topic. In terms of methods triangulation, on the one hand, triangulation for convergence is envisaged as the quantitative questionnaire aims on validating qualitative observation. On the other hand, quantitative and qualitative methods are expected to measure the same phenomenon, but they are not supposed to measure exactly the same data. Rather the differing datasets are combined in order to enrich the analysis and to help creating a fuller picture of the research problem. In this sense complementary triangulation is also envisaged. (cf. NIGHTINGALE 2009: 489f)

Figure 2: Complementary triangulation



Source: ZAHUMENSKY 2013, adapted from THEIS & GRADY 1991: 30; NIGHTINGALE 2009: 490; BOHNSACK et al. 2006: 161

Furthermore, an elementary postulate of participatory approaches is the transparency of participatory processes and outcomes. Therefore, the author paid much attention to the documentation of content-related coherences and to the derivation of interpretations during the preparation of the case study.

The present document is divided into a theoretical part and an empirical part. In the first chapter of the theoretical part "Development and Underdevelopment" varying definitions and objectives of conventional development concepts as well as biased

² External quantitative assessment of motivation degrees, cross checking of the result with the self-evaluation about motivation, and findings from the identified response sets of interviewees can be considered as a form of triangulation *within* one single method: within the standardized questionnaire about motivation.

definitions of underdevelopment are addressed. Common critiques on development are also approached. They lead over to the second chapter "Post-development" that illustrates fundamental critiques on basic ideas of the conventional mainstream development concept. Post-development's claim for radical democracy brings participation into the focus. Hence, in chapter 3 "Participation" participatory approaches to development and participatory methodologies are illustrated in detail. In doing so, the ambivalent character of participatory practice is worked out. By the end of chapter 3, discussions about participation in general are narrowed to the illustration of the procedure and objectives of *Participatory Technology Development* (PTD) as a methodology of participatory research that combines research objectives with agriculture and development elements. In the last chapter of the theoretical part "Motivation" basic elements of motivation psychology, and especially of achievement motivation, are outlined. This chapter completes the range of background information that is relevant for the case study.

In the empirical part details on the case study's research design, research region, target groups, objectives and methods are illustrated in the first chapter "Case study". The succeeding chapter "Results" presents all results from the field work: observations on capacity building of the local research team in participatory methodology, results from the qualitative evaluation of PTD-tools and from the quantitative evaluation of motivation degrees. In chapter 7 "Discussion of results" debatable findings from the results are scrutinized. Finally, the results are discussed against the backdrop of post-development criticism, i.e. in the light of fundamental critiques on mode of action and effects of participation and development. By this way, insights about effects of PTD-tools are scaled up. The empirical part is completed with the listing of recommendations about ways of improving the local PTD-process, and about necessary further investigations. A concluding chapter finally condenses main statements as a kind of lessons learned.

(II) THEORETICAL PART

1. Development and underdevelopment

The research question of the case study implies the very general question '*What is participation in development good for?*' Discussing fundamental parameters of participation in development studies such as its spirit and purpose or potentials and challenges cannot be decoupled from reflecting development itself. This chapter gives an insight into the difficulties with the term development and associated issues. Besides, it serves for a better understanding of the post-development debates which are addressed in chapter 2.

KATIE WILLIS states that on the base of clearly formulated goals (f.i. the *Millennium Development Goals*) the definition of 'development' seemed to be easy at a first glance. Actually, during the last six decades, various scientists, politicians and practitioners defined development and formulated goals to achieve development of countries which seem to lack development. But one gets the impression that "[...] what is important is the end point to which a society gets, not how those goals are achieved." (WILLIS 2005: 1). A representative of German speaking development experts, FRED SCHOLZ, agrees to the problematic of the development term and states that "[d]evelopment and underdevelopment are widely used concepts. [...] But the understanding of development varies as much as the number of those who apply this term. Hence, there is no generally binding and accepted definition."³ (SCHOLZ 2006: 47, own translation) This results from the complexity of the topic itself as well as from the various economic and political interests of the countries of the North (SCHOLZ 2004: 33; NOHLEN 2000: 216).⁴ Another renowned development expert in German speaking development literature, DIETER NOHLEN, states that development is not a non-judgmental term but dependent on space, time and especially on individual and collective value definitions (NOHLEN 2000: 216). (cf. also WILLIS & KUMAR 2009: 111) There is a range of views to approach development, and a continuous diversification of concepts and definitions. It is thus important to keep in mind that development (as well as its counterpart underdevelopment) are normative terms and that their definition is part of the development problematic itself (Ibid. 2000: 216).

Due to the ambiguity of the term development, the author is well aware about the ambivalence of terms such as 'developing countries' or 'industrialized countries'⁵. However, since there are still no more adequate terms they will be frequently used simultaneously with the expressions 'countries of the South' and 'countries of the North'⁶.

³ There are different approaches to the conception about the desired direction of social changes, to theories about causes of underdevelopment, to considerations about the social actors of transformation, and to decisions on instruments to achieve socio-economic change, etc. (NOHLEN 2002: 227).

⁴ The author assumes that countries of the South pursue own political and economic interests as well.

⁵ For the conceptual discussion and the biased assumption of nations states as reference base for developing or developed units see MENZEL 1992 and MENZEL 2010: 23f)

⁶ Similar to the modernist designation of 'industrial nations' and 'developing nations' these terms implicitly base on s definition of development as a *catch-up* process of the South towards achievements of the North.

1.1 Development

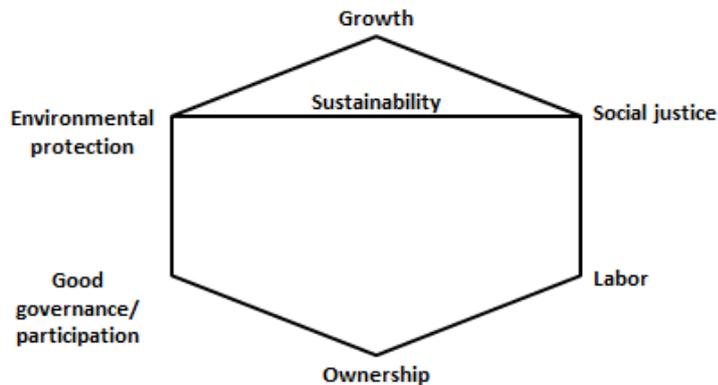
NUSCHELER reduces the development problematic to an accurate comparison with diseases since he describes underdevelopment as a syndrome of a disease: "Any promising therapy requires an unambiguous diagnosis" (NUSCHELER 2006: 207, own translation). In order to find cure (development) for the syndrome (underdevelopment), development theory has to initiate a process through explanation of causes of underdevelopment while taking into account regional disparities. (NUSCHELER 2006: 207, own translation). With this metaphor, two aspects of development become apparent. On the one hand, engagement in development issues requires theoretical enlightenments, i.e. explanation of causes and the description of structures ('diagnosis'). On the other hand, it demands for theoretically founded practical instructions for rapid and sustained problem solving ('medication').

In the 1990s, NOHLEN and NUSCHELER suggested an explanatory model, the 'magic pentagon' of development, which mediates between theory and practice in order to explain and comprehend the multidimensionality of above all the term development itself. According to the authors, development consists of five interrelated elements: growth, labor, equity and justice, participation, and independence (NOHLEN & NUSCHELER 1993: 64ff.). With this model, the authors intend to reduce the complexity of development processes; to name central issues of development, and to consider the (contradictory) interrelations between each of them. Later, NUSCHELER enlarged this pentagon and linked it with concepts such as sustainable development and the 'hexagon of civilization' of SENGHAAS⁷ to a multidimensional 'hexagon of development policy' which accentuates the social and ecological dimension of development.

The terms should be taken as allegoric representatives of former colonies in the southern hemisphere as well as for the former colonial powers in the northern hemisphere. (cf. KRECZI 2011: 1)

⁷ SENGHAAS developed a scheme of interrelated elements (e.g. constitutional legacy, democratic participation, conflict culture, social justice, interdependencies, and monopoly on the use of force) that describes civilized interactions of the global society. (SENGHAAS 1994: 24)

Figure 3: Hexagon of development policy

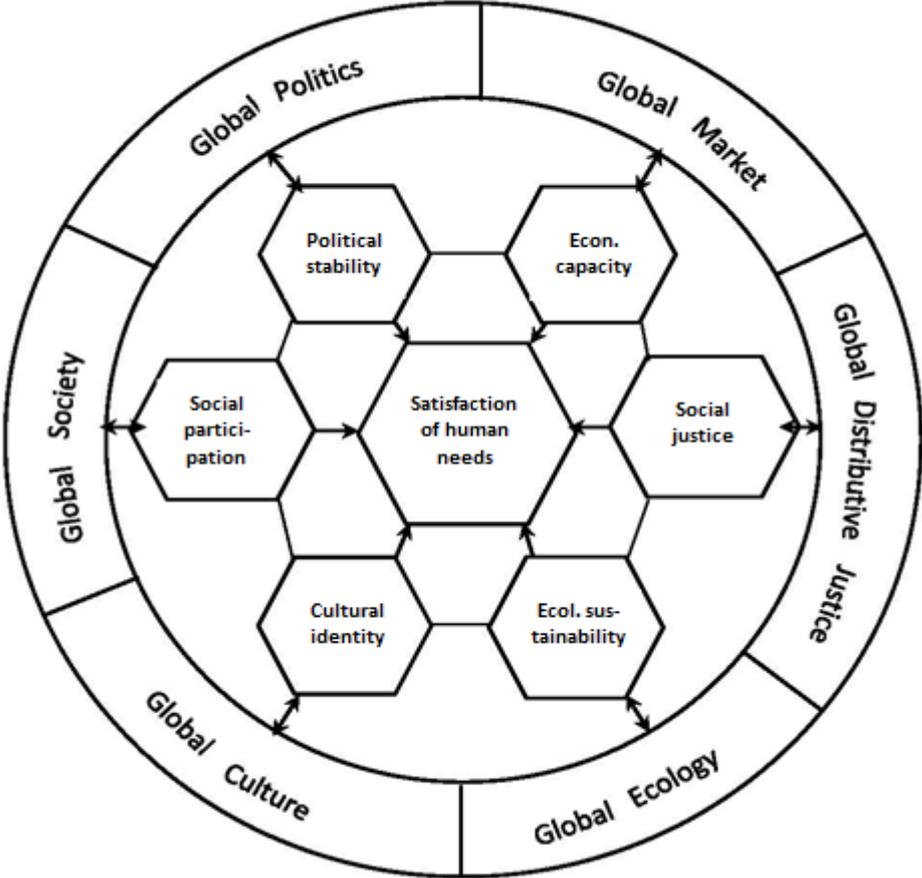


Source: NUSCHELER 2006: 247, own translation

Another well-known German development expert, ULRICH MENZEL, refined this scheme and transformed into a 'hexagon of development'. He additionally refers to the stakeholders' level since he underlies satisfaction of *basic needs*⁸ as the central aspect of development. Moreover, he integrates the systems level (i.e. establishing beneficial frame conditions) since any stakeholder's activity is embedded into certain societal and geographic frame conditions. The vertices of the hexagon on system level (which are both conditions and goals of development) are political stability, economic productivity, social justice, socio-political participation, cultural identity and ecological sustainability which are not defined as hierarchical but as principally coequal. According to MENZEL, these frame conditions on the one hand affect the satisfaction of *basic needs*, and on the other hand they interact with each other while finding themselves in a constellation of tension especially in the face of global issues of policy, economy, society, equity, ecology and culture. Correspondingly, according to MENZEL, development takes place on three levels: on individual level, on nation state level, and on global level. Furthermore, development is subjected to additional constellations of tension of situational chances or challenges between those three levels. Those, in turn, can lead to either positive development in any or all of the referred dimensions or to development blockades or even to undesirable developments. (MENZEL 2010: 13ff.)

⁸ MENZEL accentuates that needs are relative and dependent on local conditions and facilities. Insofar, this determinant of development can be developed itself. In turn, development is a highly relative process since it depends on relative needs. Consequently, development is a continued process without final stage. (MENZEL 2010: 13)

Figure 4: The hexagon of development



Source: MENZEL 2010: 14, own translation

With this scheme, MENZEL gives a suitable analytical and normative reference instrument for development theory and sensitizes for the duality of development. Besides, this model points out the importance of reflecting development issues also on individual level as it is intended in the present case study.

The above mentioned schemes exemplarily clarify development in its dimensions, intentions and interrelations or areas of tension. The syndrome that made the development idea arise after all is manifested through the perception of world society that there are serious socio-economic deficits in some countries on the world. Such deficits have been commonly denoted as underdevelopment.

1.2 Underdevelopment

Underdevelopment is a controversial term. It implies a pejorative and detrimental connotation for the majority of nations of the 'Third World' since it is associated with backwardness and inferiority (NUSCHELER 2006: 186). The stigmatizing character of the term is accentuated through the diverse statistical values through which underdevelopment becomes measurable. Poverty, malnutrition, illiteracy, homelessness, endemic diseases,

infant mortality, life expectancy, mass migration, population boom, per capita income, and much more are criteria to categorize a conglomeration of actually quite heterogeneous countries. These criteria are throughout oriented on deficiency signs⁹. (SCHOLZ 2006: 50) Hence, underdevelopment is often substituted with the term poverty but the latter can only express a consequence of the rather structurally induced problem of underdevelopment (NUSCHELER 2006: 186). Summarized, underdevelopment can be defined as the opposite of everything that pertains to development per se. As such, the term is by definition legitimized in order to express an insufficient capacity of states to allow their population to live a humane life by providing indispensable goods and services. (NUSCHELER 2006: 186)

The theoretical frame of this work refers to post-development studies and the critique on conventional development approaches. In order to comprehend the genesis of the latest revitalized theoretical-philosophical debate about development and participation in the context of post-development studies, it is necessary to recapitulate the main positions in development debate. At this, the author refers to the term development discourse¹⁰ as a specific ensemble of ideas, theories/ concepts and statements that are made about development. They have been transformed into practice and thus gave meaning to physical or social reality. The set of statements in the discourse is characterized by a certain systematic and regularity, but at the same time interrelations of threads remained complex so that a complete recapitulation of development discourse would go beyond the scope of this work. The following chapter roughly retraces elements of the development discourse and its main contrasting positions.

1.3 Chronology of (under)development

This chapter shapes the discourse of experts about how and which kind of development could be achieved during the last 60 years. In the course of time, some development strategies have been influenced by global political events (f.i. Cold War, building of the Berlin Wall) and some remained unaffected¹¹. The main characteristic for the development debate is a controversy of approaches. (RAUCH 2009: 66f; cf. WILLIS & KUMAR 2009: 111)

⁹ Despite the biased character of the terms development and underdevelopment, and despite their biased criteria of measurement, conventional approaches for the description of deviating developments in India are also used in this paper since, at the moment, there seems to be no alternative way of describing underdevelopment or structural deficits.

¹⁰ The term discourse is multifaceted. Different discourse concepts have in common that discourse implies oral or written forms of language use i.e. linguistic communication. In empirical human geography discourse excludes colloquial meanings such as discussion but encompasses an analytical tool (discourse analysis). In discourse analysis language is considered as the crucial constructivist element of social reality. Accordingly, from constructivist viewpoint, language comes to the fore of scientific analysis. (REUBER & PFAFFENBACH 2005: 202)

¹¹ In contrast to development policy trend setting international strategic development discourse took place mostly unaffected by changes of governments and to some extent independently of global policies. (cf. RAUCH 2009: 65)

One group of early development theories, the 'Grand Theories', emerged in the USA in the post-World War II era since the 1950s in the context of capitalism, mass prosperity and the decolonization process. At that time, consciousness about mass poverty increased and the fact became evident that former colonial states showed significant structural deficits¹² and inability to survive¹³ after the declaration of independence. Due to the gap between prosperous societies and mass poverty, world society was asked to bring about social change and/ or economic growth of the disadvantaged countries.

1.3.1 Modernization Theories¹⁴ (1960s)

The first so-called theories of modernization focused in their explanation of underdevelopment and definition of development on axioms such as economic growth, modernity and *catch-up* development.

"'[M]odernity' has been used as a term to describe particular forms of economy and society based on the experiences of Western Europe. In economic terms, 'modernity' encompasses industrialization, urbanization and the increased use of technology within all sectors of economy. This application of technology and scientific principles is also reflected within social and cultural spheres"

(WILLIS 2005: 2)

Besides, key elements of modernization according to modernists "included [...] nation-state building and the replacement of traditional thoughts and belief with a notion of scientific economic rationality" (WILLIS & KUMAR 2009: 112). Supporters of this approach¹⁵ define underdevelopment in the sense of ROSTOW's stage model of development (ROSTOW 1960) as a stadium on the way to a developed society. The highest stage is exemplified by industrial countries which are worth imitating (SCHOLZ 2004: 81). Accordingly, underdevelopment was interpreted as backwardness. (RAUCH 2009: 67ff.; KRECZI 2011: 1)

Modernists retrace the origins of underdevelopment to unfavorable nature and tradition of developing countries, i.e. to endogenous factors. Their strategies are based on the thesis that strong economic growth is supposed to have widespread *trickle-down* effects from which lower social strata would benefit as well, and thus would improve health, education, quality of life and equal income distribution (e.g. between rural and urban areas) as a side effect. Correspondingly, development was regarded as a kind of self-sustaining process that must only be given a push. Entities which define development primarily as an economic process have been and are still predominant in the development discourse (e.g.

¹² For instance high population growth rates, high illiteracy rates, low entrepreneurial spirit, traditional social structures, natural disadvantage etc. (SCHOLZ 2004: 74)

¹³ A surviving state in this sense is understood as a state that would be capable to develop own self-sustaining capitalistic dynamics or any endogenous dynamic development impulses which would be comparable to industrial countries. (SCHOLZ 2004: 78 and 81)

¹⁴ There are different approaches to modernization as development paradigm which is why the author refers to theories in the plural. This extends to dependency theories, where different approaches of dependency coexist.

¹⁵ Popular contributors are WALT W. ROSTOW, SEYMOUR LIPSET, SAMUEL HUNTINGTON, WOLFGANG ZAPF, and ARTHUR LEWIS.

the WORLD BANK as a global actor). (WILLIS 2005: 3; SCHOLZ 2004: 75ff.; NOHLEN 2002: 228, NUSCHELER 2006: 214ff.; RAUCH 2009: 71) According to *modernization* theories' logics the strategic practices concerning development assistance consist of external aid for developing countries in the form of financial, technical and economic cooperation which is considered as coercively required in order to stimulate internal efforts for development¹⁶. Therefore, in the 1960s, industrialization and especially rural modernization (known as the 'Green Revolution') have been pushed forward.

However, in parts there was 'growth without development', *trickle-down* effects did not take place, social disparities increased and the 'Green Revolution' proved to reach only better-off farmers instead of the resource-poor small-scale farmers whose situation even deteriorated. Despite some isolated exceptions such as South Korea and countries with at least high economic growth rates at that time (e.g. Brazil, India) the concept of *catch-up* development as universal bailout plan obviously had failed. (RAUCH 2009: 68)

1.3.2 Dependencia Theories (1970s)

Due to the general failure of the modernity approach, and in the light of the appearance of a set of unexpected even worsening development f.i. in former colonial states¹⁷ the antithetic answer to *modernization* theories was given in the late 1960s with the so-called *dependencia* theories¹⁸. They originated mainly in Latin American states, but they are characterized through criticism of capitalism and Third-World protest movement throughout all Europe at that time. *Dependencia's* explanation attempt goes beyond endogenous causes of underdevelopment and, in addition, it represents the attempt to support development actively instead of waiting for *trickle-down* effects.

Dependencia theories defined underdevelopment not as a stadium but as a deficient structure due to *structural heterogeneity*¹⁹, i.e. externally caused deformation of national economies in developing countries through imperialistic exploitation practices of industrial countries and through external dependencies. The conventional attempts of industrialization in developing countries as well as efforts for agricultural modernization involved a high degree of imported machinery, materials and fuel with the result that national import investments often exceeded the foreign exchange revenue. This contributed

¹⁶ Namely to uncover needs, to stimulate activities to satisfy needs, to stimulate economic processes such as industrialization, to use of local resources, to initiate democratic development, and to initiate cross-social differentiation processes. (SCHOLZ 2004: 81)

¹⁷ Independence turned out to be an illusion in some former colonial states because new internal disposers with 'neocolonial' exploitation practices stepped in place of the old colonial sovereign state, the new administrative and political leadership was characterized by incapacity, corruption and internal power struggles. (BEHRENDT 1971: 24ff. as cited in SCHOLZ 2004: 78)

¹⁸ Popular contributors are ANDRÉ FRANK, RAÚL PREBISCH, DIETER SENGHAAS, FERNANDO H. CARDOSO.

¹⁹ This expression was introduced in the 1960s by economists of the CEPAL (*Comisión Económica para América Latina y el Caribe*), in the first place by RAUL PREBISCH with his '*Centre-Periphery-Model*'. *Structural heterogeneity* describes elementary economic, political, social, technological and cultural differences within developing countries as well as between so-called developed centers and underdeveloped peripheries. (NOHLEN 2000: 696)

to the severe accumulation of debts of developing countries. Therefore, *dependencia* approaches accused *modernization* approaches to have had aggravated the situation of underdevelopment. (RAUCH 2009: 69)

In the logic of the *dependencia* approach, the overcoming of underdevelopment could only be achieved by unveiling and abolishing external dominance and dependence which create or perpetuate negative socioeconomic structures in developing countries. This indicated likewise the omission of external influence (e.g. development aid) in order to avoid the dominance internal structures and deformations that are caused by industrial states²⁰. (NOHLEN 2002: 228; SENGHAAS 1974, 1979; SCHOLZ 2004: 78ff.)

Summarized, *dependencia* theories methodologically criticized the insufficient analysis of spatiality²¹ and historicity from *modernization* theories' side as well as the scarce reflection on the role of European influence in overseas during the colonization era. Furthermore, *dependencia* theories criticized the Euro-centrism of *modernization* theories' principles including its strong emphasis on economic, cultural, military and spiritual superiority which resulted in the disregard of local indigenous structures and the belittlement of influence by Western countries. Thus, *dependencia* theories denied or at least questioned modernists' practices such as external (financial) aid as those could merely perpetuate Western capitalistic influence and dependency structures of developing countries. (SCHOLZ 2004: 86)

In contrast, *modernization* theories strongly criticized the uncritical glorification of culture, society and economy in post-colonial states and *dependencia* theories' superficial analysis of colonial history. Modernists categorized *dependencia* theories as ideological and closely related to MARXIST theories which overestimated dependency and its consequences. Moreover, world revolution ideas such as the dissociation from global markets were seen as an illusionary problem-solving approach. (SCHOLZ 2004: 86)

Both competing theoretical positions have the unquestioned assumption of *catch-up* development in common, and they both claim universal validity while their selection of procedures remained different. Both cannot be regarded as the ultimate solution for the variety of problems of poor or underdeveloped countries since they were not able nor to explain the emergence nor the continuance of regional development disparities. Furthermore, they did not deliver tangible practical instructions. Subsequently, after a long period of ideological disputes, after the relentless increase of poverty levels and indebtedness, after the 'crisis of development aid'²² and, occasionally, due to the finding that growth is not development²³, both positions converged²⁴ at the beginning of the 1980s.

²⁰ SENGHAAS suggested a temporal walling-off of developing countries from the global market in order to permit an auto-centered development of internal productive resources appropriate to own needs, possibilities and necessities. Afterwards, the reintegration into global market was intended. (SENGHAAS 1979: 388ff.)

²¹ The modernity paradigm was taken out of the spatial and temporal context. (WILLIS 2005: 3)

²² PEARSON-Report (PEARSON 1969)

²³ Club of Rome: The Limits of Growth (MEADOWS et al. 1972)

Due to the ineffectiveness of development practice this epoch is usually labeled as the 'lost decade'. Finally, the opposite positions found to a pragmatic and more realistic approach which since the beginning of the 1990s, led to the 'debate of strategies' under the guiding principle of sustainable development²⁵. (SCHOLZ 2004: 86f) Implicitly, the desire for a universal approach and universal solutions continues to exist. Even alternatives to the 'Grand Theories' claim for a widespread impact range.

In the following, two opposing approaches will be illustrated as alternative development approaches to the 'Grand Theories'. Basic assumptions and objectives of the *basic needs* approach and the *neoliberal* approach have still effects on contemporary development concepts. Hence, they can be taken as representatives for the continuous sidestepping character of development discourse.

1.3.3 Basic needs approach and poverty orientation²⁶ (1970s/ 1980s)

As a consequence of the growth model's problems, the goal of economic growth per se was questioned and replaced by growth that should be applied for growth for the poor²⁷. Steering towards a paradigm of combat of poverty (elimination of severe existential problems) instead of concentrating on development per se (bringing progress and prosperity) bears witness to the disillusionment about the hitherto very ambitious goals of development practice. Nevertheless, even from the *basic needs* approach many ambitious claims arose since it was regarded as a concept of creating the indispensable base for further self-reliant development²⁸. Instead of simply offering new technologies and services, emphasis shifted to target-group-specific²⁹ support measures which allowed target groups to satisfy their *basic needs*, i.e. to ensure a minimum configuration of consumption products (such as food, clothing, and housing), to facilitate access to *basic-need-oriented* public services (such as drinking water supply, sanitation, transport, health care, educational

²⁴ SCHOLZ gives various reasons for the convergence of the opposing theoretical positions: the strong call for a new international economic order by countries of the South, the tiredness about theoretical discussions without practical benefits as well as the more severe and urging problems in countries of the South. (SCHOLZ 2004: 86)

²⁵ Sustainability in a very general way is defined as a guiding principle for practices which meet the needs of the present world population without reducing the availability of resources that are required to meet the needs of following generations. (WILLIS & KUMAR 2009: 115)

²⁶ That is to strengthen the basic economic potential of those who are mostly affected by poverty. (SCHOLZ 2004: 207)

²⁷ The reversal of trend towards poverty reduction was initiated by the PEARSON Report (PEARSON 1969) as well as by the famous Nairobi speech of the former president of the WORLD BANK, ROBERT MCNAMARA, in 1973.

²⁸ According to contemporary direct democratic participatory approaches, local communities were intended to be enabled to analyze local conditions, problems and potentials on their own, and to self-determine their development process through self-initiative. (RAUCH 2009: 73)

²⁹ The orientation on target groups implies the reference to as homogenous groups as possible and to identify exactly their needs. (SCHOLZ 2004: 207) Target groups of *basic-needs* oriented development strategies are (groups of) persons of a population whose individual and/ or group-specific consumption of private and/ or public *basic-needs-commodities* do not reach an absolute or relative standard. (NOHLEN 2000: 316)

institutions), as well as to facilitate immaterial *basic needs* components such as employment, social and political participation, and self-reliance³⁰. (RAUCH 2009: 69; NOHLEN 2000: 316)

Basic needs approaches promoted the demand to follow strategies of integration into global markets of Southern countries. Debt relief as well as the technical and financial bilateral or multilateral cooperation between donor countries and recipient countries was initiated. Aspects of self-help, cultural sensibility, democracy, sustainability, the use of adapted technologies and the acknowledgement of *indigenous knowledge* as well as the use of informal structures became urgent since, especially during the 1970s, the poor had transformed into a population group of 'needy' developing a passive receiver mentality. Thus, the turn from *top-down* to *bottom-up* approaches in development practice was launched (*grassroots* development). A practical response to the hitherto distribution-oriented strategies was the more to the regional context related concept of *Integrated Rural Development* (IRD, GTZ 1983) which pursued a more consistent integration of emancipatory³¹/ participatory principles, as well as the use of local resources, site-specific, holistic and cross-sectoral strategies, and an orientation on local environmental, economic and socio-cultural conditions. IRD represents the spirit of this age since it was oriented on the four core principles 'poverty orientation', 'orientation on target groups', 'participation'³² and 'sustainable development'³³. (RAUCH 2009: 70ff., NOHLEN 2000: 317) Thanks to *basic needs* approaches ownership³⁴, empowerment³⁵ and self-reliance became omnipresent key words in development practice. (SCHOLZ 2004: 86f, RAUCH 2009: 69f, NOHLEN 2000: 316f) Yet, *basic needs* strategies also faced problems due to their difficult operationalization, as well as due to their socio-technocratic and paternalistic procedure.

The idea of poverty orientation pervades development strategies until today. The intention of combining economic growth with poverty reduction revitalized since the 2000s in the concept of *Pro-Poor-Growth*, not forgetting the strong poverty orientation of the *UN-*

³⁰ The term *self-reliance* is an alternative concept to growth oriented development strategies, and in the development context it comprises the confidence on own strengths, instincts and ideas to utilize own resources for the satisfaction of *basic needs*. *Self-reliance* is linked with the seeking for development paths which are adapted to the respective social and cultural traditions of a country. (cf. NOHLEN 2000: 669)

³¹ Emancipatory approaches comprise also feminist concepts which gained importance since the 1980s. (cf. RAUCH 2009: 74)

³² In the context of IRD participation is defined as decision making and as active involvement in the planning and implementation phase of development projects (= project participation). (SCHOLZ 2004: 207)

³³ Here sustainable development in its holistic meaning is addressed (as qualifier of a development process as a multidimensional process of ecological, social and economic sustainability: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (BRUNDTLAND REPORT 1987) but in the context of IRD emphasis particularly lies on the continuance of external promoted measures beyond the period of funding. (SCHOLZ 2004: 207; RAUCH 2009: 70)

³⁴ On a national scale ownership is defined as partner countries' self-governing responsibility and proactive influence on development projects activities as basic condition for sustainable development. (cf. NOHLEN 2000: 590)

³⁵ Empowerment is defined as the stakeholders' capability for self-determined action, as well as the capability for economic, political and social participation. (NOHLEN 2000: 212)

*Millennium Development Goals (MDGs)*³⁶ which have been drafted in the year 2000 by representatives of the UNITED NATIONS ORGANIZATION (UNO), WORLD BANK, ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD), and various Nongovernmental Organizations (NGO's). Since then, these goals - which emphasize on social sectors and poverty of capabilities in the sense of AMARTYA SEN - have been a milestone of international and national development efforts, and they nowadays act as an international framework for development politics. (RAUCH 2009: 70ff., NOHLEN 2000: 316) Currently, only three of the eight MDGs have been achieved prior to the deadline for the achievement of objectives until 2015. Thus further efforts of a global partnership for development are needed. Based on the insight that most of the ambitious development goals will not being achieved until the deadline the MDGs are recently being reviewed for the purpose of providing a new global development agenda for the post-2015 period as well as for the development of a new format for global partnerships. (UN-ECOSOC 2013)

Yet, in sum, *basic needs* approaches remained an approach for aid agencies until today since political and bureaucratic elites further on support the growth principle for development. (RAUCH 2009: 71; NOHLEN 2000: 317)

1.3.4 Neoliberal *structural adjustment policies* (1980s/ 1990s)

By the 1980s, a new set of theories emerged from international institutions' side that again focused on economic aspects of development. Inducements for this trend were on the one hand own interests of industrialized countries (high labor costs in industrial states required international location competition) and on the other hand, the debt crisis of developing countries during the oil crisis in 1979/80 required economic solutions. The demand for a 'New Global Economy', improved trading conditions, and the demand for free trade in developing countries came up. According to these neoliberal approaches, development policies should be left to the invisible hand of free market mechanisms. (RAUCH 2009: 71f)

In the face of increasing defaults on debt repayments at that time international organizations such as the WORLD BANK (WB) and the INTERNATIONAL MONETARY FUND (IMF) provided financial support to developing countries on conditions that they followed certain policies which were titled *Structural Adjustment Programs* (SAPs). Structural reforms (reduction of public administration), financial deregulation and liberalization (opening of domestic markets), and privatization have been considered as main priorities promoted by the IMF and WB organizations. (RAUCH 2009: 75f)

³⁶ The eight MDGs are: 1. to eradicate of extreme poverty and hunger, 2. to achieve universal primary education, 3. to promote gender equality and empower women, 4. to reduce child mortality, 5. to improve maternal health, 6. to combat HIV/ AIDS, malaria and other diseases, 7. to ensure environmental sustainability, 8. to develop a global partnership for development. (UNDP 2013)

In the end, SAPs showed some macroeconomic success (f.i. in flagship countries such as Ghana) but similarly to the preceding economic approach of *modernization* theories social and economic inequalities have even increased during SAPs' implementation³⁷. Job cuts in the public sector, reduction of public welfare spending, as well as through import competition and reduction of subsidies weakened industrial sections undermined a development of mass buying power and domestic markets in developing countries. In addition, neoliberal policies showed high insensitivity to spatial variations, cultural and social concerns. This critique initiated a rediscovery of poverty approaches (SEN 1999, 2000) and the shift towards an economic based poverty oriented development program called *Poverty Reduction Strategies* (PRS). PRS involved that governments of developing countries should develop tangible strategies through participatory processes, so-called *Poverty Reduction Strategy Papers* (PRSP) in cooperation with organizations of civil society and technical assistance of donor countries. The PRSP approach at least took into account to leave responsibility and conception of development activities to developing countries. In turn, PRSPs are nowadays criticized for their linkage to debt relief³⁸ as well as for overcharging the capacities for the self-controlling of developing countries that often resulted in pseudo-ownership and non-participation of target groups. (RAUCH 2009: 78ff.; WILLIS & KUMAR 2009: 113f)

Due to the unceasing attempts to find universal solutions for development problems, in 1992, MENZEL felt compelled to declare once for all the failure of the 'Grand Theory' and recommended the application of middle range theories in order to explain development and to find solutions for development problems.³⁹ (MENZEL 1991: 45f; MENZEL 1992) Among others, this attempt led to an increased pluralism of concepts. Lots of 'middle range theories' (practical and theoretical approaches, approaches on micro and macro level) tried to tackle the tangible causes of underdevelopment, and to initiate sustained (alternative) development, respectively. For the retracement of fundamental problems in the development discourse it is not necessary to illustrate them all.

Suffice is to say that those approaches have in common that they have been subjected to various paradigm shifts and realignments during the last decades (COY 2000: 49; RAUCH 2009: 80). Furthermore, paradigm shifts have been influenced by political interests⁴⁰, as well as by moral values and zeitgeist. Albeit, the paradigm of growth was never given up

³⁷ There is controversial discussion about whether poverty problems remained in spite of or due to SAPs. (RAUCH 2009: 78)

³⁸ Within the scope of HIPC-Initiative (HIPC = Highly Indebted Poor Countries) in 1999 the development of PRSPs was a precondition for debt relief. (RAUCH 2009: 78)

³⁹ In Anglo-Saxon language area the discussion about the 'impasse' or 'crisis' of development was initiated earlier by BOOTH 1985; SCHUURMAN 1993; KIELY 1995, 1998.

⁴⁰ This fact can be illustrated through remembering the development assistance which was influenced by political interests during the Cold War era. At that time the first (USA) and second (Soviet Union) political camps partly provided development aid to Third World countries with the intention to make them to join one political camp. (WILLIS & KUMAR 2009: 112)

entirely but rather different answers were given to the questions how growth could be generated and who is going to profit from it. (NUSCHELER 2006: 234; SCHOLZ 2004: 158). The 'new complexity' (COY 2000: 47) of development concepts or strategies can also be seen as a result of recent developments of globalization which emerged since the 1980s. According to COY, globalization uncovers that many ancient development problems⁴¹ are still not resolved, and that new risks⁴² for development countries have been generated due to new global-local linkages. (COY 2000: 47) Meanwhile, the recognition of the necessity of a holistic approach increased though holistic answers to complex problems are difficult to find.

1.3.5 Recent tendencies of development strategies

Currently, development efforts are characterized as part of global structural policy. The constant failure of development strategies, the challenges through effects of globalization, 'new' global development problems (such as global warming and questions of food safety that particularly affect developing countries), again ask the global community for problem-solving strategies on a broader level. Thus, there is recently a general trend of development concepts back from micro-level interventions to macro-level structural policies in order to modify the global structural framework and general North-South relations under the guiding principle of sustainable development. (RAUCH 2009: 84) Recent development approaches realign on the *Global Governance* paradigm whereupon agreements on objectives and goals take place on global level (see MDGs, Agenda 21) while the implementation responsibility remains the business of developing countries. Besides, payment transfer is intended to be turned more effective by implementing and coordinating development purposes jointly with partner countries⁴³. By this means, a deprivation of governments is avoided, and developing countries are given a chance to become a pro-active partner on global level. In this way, legitimacy of external interventions is achieved through effecting interventions on the base of a mandate. (RAUCH 2009: 107ff.) This can be understood as a consistent transfer of the *grassroots* approach on international level. However, the new challenge is to control such a multilevel policy.

THEO RAUCH suggests an ahistorical and multi-dimensional 'multi-level intervention model' of development (RAUCH 2009) in order to better analyze action spheres, and for a better orientation and coordination of development policies or general actions for change. In the first instance, the model refers to four levels from global structure policy to local empowerment strategies. RAUCH stresses that development policy can only be successful if it

⁴¹ As old development problems COY names hunger, disease, poverty, war, violence, displacement, marginality, dependency, lack of satisfactions of basic needs, progressive degradation of natural resources. (COY 2000: 47)

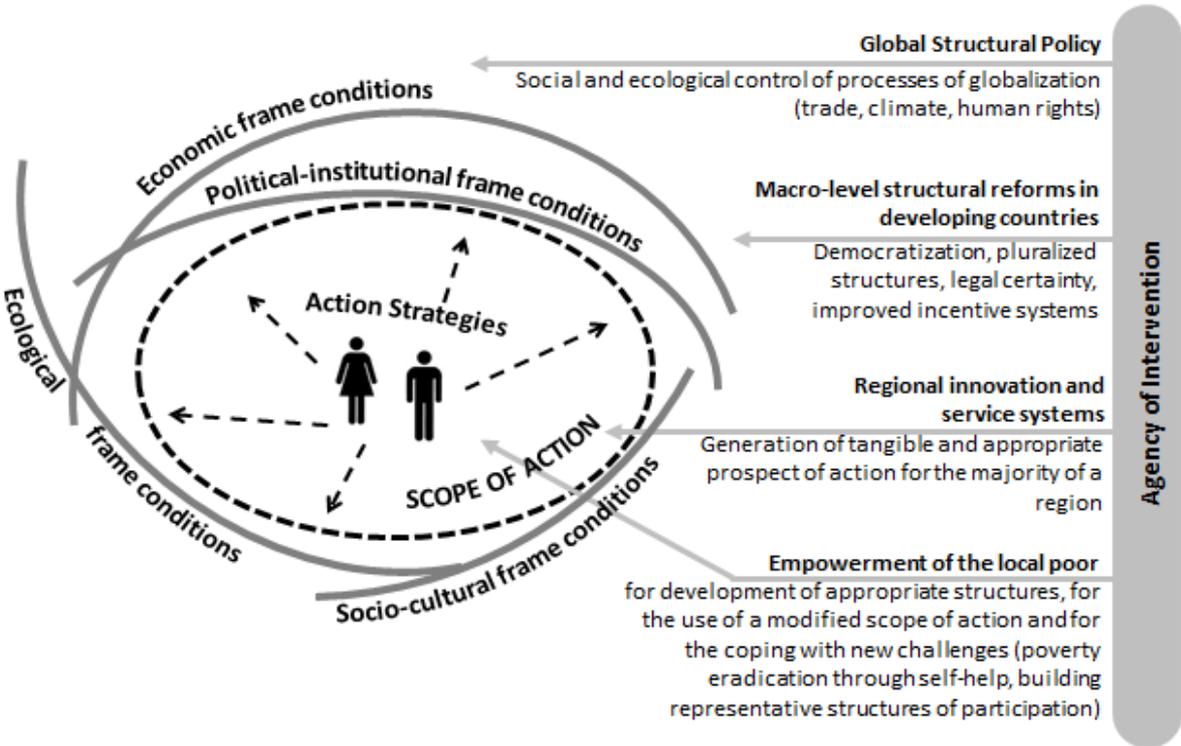
⁴² According to COY such new risks of globalization are the effects of neoliberalism and structure adjustment policies, the more intense orientation on the global market, as well as socio-spatial fragmentation. (COY 2000: 47)

⁴³ In order to give expression to the equal character of cooperation, 'developing countries' are recently denoted as 'partner countries' in development jargon.

takes into account every level from local to global level. Besides, every dimension of human life should be integrated (economy, politics, environment, and social system). Furthermore, RAUCH's intervention model integrates both system/ structure-oriented as well action-oriented intervention approaches. A structure-oriented approach aims on changes of frame conditions that may be development-inhibiting while an action-oriented approach aims on empowering actors and their scopes of action. RAUCH intends a synthesis of both perspectives. He assumes that development can only be fostered through the interplay of strategies on both levels since the levels are interrelated. They are interrelated insofar as frame conditions influence each other and create varying spaces or scopes of action for local actors. Such scopes of action are dependent on negotiation processes between different actors on different levels. Thus the scopes of action are individual, they are varying in their magnitude, and they are not fixed. On the one hand, it cannot be assumed that individuals are able to utilize their scopes of action in an optimal way for the improvement of their situation or for problem solving due to restricted individual capacities or limited information. As a consequence, a vacuum can occur and scopes of action remain unused. On the other hand, individuals can expand their scopes of action by changing frame conditions on the respective level or by using action vacuums of other spaces. (RAUCH 2009: 129; RAUCH 2003: 35 ff.)

In sum, the model analyzes a dynamic process where (development) actions can take place in two different ways: either interventions or actions for change occur to the end that frame conditions on global, regional or local level are changed or to the end that local actors are empowered to use or enlarge their scopes of action and to defend their own interests. The latter requires a high degree of self-initiative, local self-responsibility, as well as the capacity and opportunities to articulate needs through participatory and direct democratic structures. Moreover, actions usually occur simultaneously on the various levels and in various dimensions of life since one-sided changes do not automatically lead to changes on other levels (f.i. empowerment and self-determined activity on local level is restricted if national or international frame conditions remain rigid or difficult to overcome).

Figure 5: Four-Level Strategy of Intervention



Source: RAUCH 2009: 133, own translation

From development policies' perspective and with regard to the four levels where development policies are implemented, interventions should be synchronized regarding their basic alignment. Thereby the regional level takes the part to mediate between global abstract political-economic reforms and specific local action strategies considering the respective local conditions. Hence, in this model transcending coordination between all relevant actors, distribution of responsibilities and the contribution of specific complementary expertise of different disciplines are important requirements. Through such a team play the systematic reduction of complex problems can take place, and development becomes manageable. (RAUCH 2009: 134f, 357f)

For the purpose of this paper RAUCH's model opens up interesting starting points for reflections about the multi-layered interplay of levels and spheres of social life, about scopes of action on local level, the creation and utilization of local scopes of action, empowerment of local actors, the role of individuals for development activities and their motivation for proactive participation, and the various development-inhibiting obstacles that may occur on different levels and in different spheres.

1.3 Critique of development: 'dialectic without synthesis'

As seen above, an important point of criticism on development is linked with development-inhibiting global frame conditions. The Sisyphean challenge of coping with development problems, the aggravation of poverty as key problem (NUSCHELER 2006: 96), as well as a poor temporal and regional broad impact of development efforts led to the discussion about the necessity of global structural change policies that imply a change of global frame conditions (concerning especially world trade patterns)⁴⁴ which are currently regarded as development-inhibiting. The viability of such an anti-capitalistic, globalization critical and revolutionary process may be questioned heavily in the light of own economic and political interests⁴⁵ mainly of developed countries which foster development-inhibiting global frame conditions⁴⁶. Moreover, the current emphasis on macro-level development strategies is probably accompanied by a negligence of on-site development cooperation at the grassroots level. Even if global unfavorable structures could be changed anytime soon, it is questionable if the poor as target group will be able to make use of the newly gained scope of action. This question remains open a fortiori, if we consider that the change of global structural policy is a long-term process which does not literally comply with the urgently required problem-solving approach to poverty within a narrow time frame. (RAUCH 2009: 110ff.)

Besides the inhibiting frame conditions of development strategies, the pluralism of concepts did not contribute to the problem solving. According to RAUCH, the variety of development approaches and 'middle range concepts' suffers from the claim that they have found the key factor or the decisive level of intervention. But in fact, they just offer frequently contrasting one-dimensional approaches which superseded one another. (RAUCH 2009: 83) However, one can consider the oscillation between extremely antithetic positions or approaches as a dialectical process of learning and thus as a principally innovative moment. Unfortunately, this process to date depicts a 'dialectic without synthesis' (RAUCH 2009: 83). RAUCH attributes this lack of a synthesis on the one hand to the dilemma of looking for new approaches without substantially tying in with experiences of similar preceding approaches ('reinventing every time the wheel'). On the other hand, the continuous paradigm shifts could overstrain development practitioners and lead to the false

⁴⁴ A new system of ordering includes a balance of interests, an international social market economy, conflict prevention, global environmental policy oriented on the sustainability paradigm, a trustworthy human rights policy, internal (national) structural changes to more democracy, and unleashing of productive forces. (NUSCHELER 2006: 96f)

⁴⁵ "Development policies have been and still are interest-driven policies which are dependent on superior objectives." (NUSCHELER 2006: 78, own translation) and "[...] personal and material aid, as well as financial cooperation of Northern countries with Southern countries have interested political objectives, offer business and not least imply security of employment for the donor countries." (SCHOLZ 2004: 2, own translation)

⁴⁶ To mention just one example: EU/US-subsidized agricultural imports at dumping prices harm domestic markets of developing countries. (RAUCH 2009: 90f)

labelling of development practice as adapted to actual trends and insights whereas actually, this practice continues according to customs before. (RAUCH 2009: 82)

The above points of criticism open up another aspect of development critique. The magnitude of development problems and quality expectations of solutions strategies give occasion to have scruples about the realism of objectives (see the MDGs). Development strategies and theories are overcharged with the challenging tasks f.i. to overcome mass poverty, peacekeeping, preservation from global environmental collapse, promoting worldwide democracy, gender equity, human rights, to cushion globalizations costs, etc. (NUSCHELER 2006: 90). Furthermore, the range and severity of contemporary development problems require holistic and multi-level approaches. This constitutes another dilemma in developing discourse: *which entity could be able to overlook (plan, implement, control and evaluate) which kind of holistic concept?* Such an overarching approach presupposes the cooperation and consensus of a variety of actors with still diverging (own) interests. Besides the many problems technocratic development planning has obviously turned out to be an unsuccessful attempt to transform development into a predictable process (RAUCH 2009: 103). From the foregoing follows that the variety of topics that are attributed more and more to development, especially the appearance of new topics such as culture, ethnicity, gender, climate change, etc. intensify the content wise overload, and hence, lead to excessive demands regarding problem solving capacity of development theories. Hence, problems and topics of post-modern global societies are often devolved to or projected onto developing countries. In turn, from developing countries' prospect these problems are often of subordinated importance in the face of much more elementary problems that developing countries face. (MENZEL 2010: 147)

PEET & HARTWICK describe this overload appositely when they state that "development means making a better life for everyone" (PEET & HARTWICK 2009: 1), and therefore, it seems to be an unrealistic and unattainable objective. Likewise, MCKINNON refers to development as "a project of hope, guided by the aspiration for greater social justice and emancipation of the poor and disadvantaged in the world" (MCKINNON 2007: 772). This uncovering of development as a human project that is based on the 'hopeful vision' "that it is possible to create a 'better world', that human society has the means to do so, and that it can be achieved by harnessing resources and knowledges across international boundaries." (MCKINNON 2007: 772) implies that development might be a utopian project encompassing a number of unredeemed promises.

The fundamental doubts on the development project are core subject of the so-called 'post-developmentalism school' (in the following abbreviated to post-development). According to post-development thinking, conventional development concepts pursue the intention to preserve the dominance of developed countries over developing countries. They are thus accused to be hypocritical. (RAUCH 2009: 86) A hint for a hypocritical *Official Development Assistance* (ODA) from Northern countries' side can be the hitherto

unredeemed financial promises that were made by donor countries during the UN General Assembly in 1970, and which intended to provide each 0,7% of their GNP for ODA (RAUCH 2009: 106). Until this day, many countries did not fulfill their promise though f.i. the GERMAN FEDERAL MINISTRY FOR ECONOMIC COOPERATION AND DEVELOPMENT (BMZ) adheres to the promise (BMZ 2010). Post-development critique plays a major role in this work, and therefore it will be illustrated more detailed in the following chapter.

Summary Chapter 1

Although the terms development and underdevelopment are widely used, they can hardly be defined in a universal and value-neutral way⁴⁷ so that the temptation to refuse any definition of these terms seems high. Nevertheless, difficulties in explaining a complex phenomenon⁴⁸ are no excuse to give up a constructive attempt to obtain better understanding of the phenomenon. In a very general way, development can be defined as a positive or negative process of change. In development discourse it is rather considered as a positive development in the sense of evolution to improvement/ progress (STOCKMANN et al. 2010: 1; WILLIS & KUMAR 2009: 111). Following notable academics in German development research the author of this work underlies also a holistic definition of development which has to be understood as a dynamic process of change that takes place on various levels and in many dimensions (RAUCH 2009: 34f; NUSCHELER 2006: 225ff.; STOCKMANN et al. 2010). Moreover, the author stresses that development does not merely imply development of underdeveloped countries⁴⁹, but it addresses development in developed countries as well. In times of globalization, the development of one world region cannot be achieved without major changes in the other world regions.

The public discourse about development (development discourse) serves as a platform for the joint constructive solutions finding for pressing problems which countries of the South face. At this, development discourse is characterized as an ensemble of ideas, statements, concepts, theories and strategies which experiences various paradigm shifts on the way to broad consent. Thereof results that recent development policy is equipped with a pluralism of theories and strategies with contrasting objectives. The whole cluster of concepts, theories and strategies somehow failed since they were not able to explain underdevelopment nor did they deliver effective practical instructions for its overcoming.

⁴⁷ STOCKMANN states that the *per se* neutral term 'development' obtains significance only by connoted values or ideologies. (STOCKMANN et al. 2010: 1)

⁴⁸ Facing difficulties by engaging oneself in development issues is not surprising since development-related concepts have to mediate between theoretical foundation and a strong practical orientation. Moreover, it is of great importance to take the regional context into account. This implies that development practice is a discipline of ad hoc decisions and activities. Contradictions and interrelations of different elements, which are each already complex issues, do not facilitate the engagement in development efforts.

⁴⁹ "[...] 'development' is often considered as a set of processes which relate purely to the parts of the world collectively entitled the 'Third World' or 'Global South'." (WILLIS & KUMAR 2009: 111)

After all, the growth paradigm was never given up entirely, but at least social components such as participation, cultural sensitivity, etc. found their way into international development discourse.

However, globalizing processes generated new global-local linkages which issue new challenges to the already very ambitious objectives of developmental commitment. In consideration of all the critiques to development efforts and in the light of the Herculean task of development practice the questioning of development per se is not surprising.

2. Post-development

Recently, there are voices within development discourse⁵⁰ which can be characterized as denoting the "most significant shift in development theory in the last decade of the twentieth century" (ZIAI 2007: 3). ESCOBAR stresses that "post-development is not a new historical period to which its proponents believe we have arrived or that is within reach" (ESCOBAR 2007: 20) but it rather concerns a variety of critical studies about mainstream development discourse. Those critical studies analyze development as discourse of domination and claim the end of development policies in general:

"The last forty years can be called the age of development. This epoch is coming to an end. The time is ripe to write its obituary." [...] "The idea of development stands like a ruin in the intellectual landscape. Delusion and disappointment, failures and crimes, have been the steady companions of development and they tell a common story: it did not work. Moreover, the historical conditions which catapulted the idea into prominence have vanished: development has become outdated. But, above all, the hopes and desires which made the idea fly are now exhausted: development has grown obsolete."

(SACHS 2010: xv)

In his seminal book *The Development Dictionary* (SACHS 1992/2010) one of the leading post-development thinkers, WOLFGANG SACHS, offers "a critical inventory of development credos" [...] and "calls for apostasy from the faith in development in order to liberate the imagination for bold responses to the challenges humanity is facing" (SACHS 2010: xvi). The realization that several models of development did not fulfill promises of creating greater social justice or emancipation of the disadvantaged people of the world is not new. Yet, post-development represents a more radical critique, and questioning the "epistemological categories, hierarchies, and assumptions of development discourse" (SIDAWAY 2007: 346) became its crucial point of criticism. In its radicalism post-development discourse⁵¹ meanwhile appears rhetorically impetuously and conspiratorial⁵² (cf. ESTEVA

⁵⁰ "[T]o a considerable extent postdevelopment critiques represent reformulations of skepticism about (and alternative conceptions of) development that have been evident for a long time. Some skeptics have therefore argued that postdevelopment critique is not really beyond, outside or subsequent to development discourse." (SIDAWAY 2007: 348)

⁵¹ The term 'post-development discourse' encompasses at this point 'post-development', 'beyond development' as well as 'antidevelopment' positions. The more radical approach of 'antidevelopment' involves

1993; ESCOBAR 1995; RAHNEMA with BAWTREE 1997; SACHS 1992/2010; LATOUCHE 1993; SHIVA 1988 and RIST 1997).

However, there are different theoretical approaches within the post-development debate. Yet, since most of them agree on the cornerstones of development critique they can be summarized as one theoretical school⁵³. In the following different dimensions of *post-development* critique will be illustrated.

2.1 Discourse analysis

Post-development studies call themselves as 'subversive', 'human-centred' and 'radical'⁵⁴ (RAHNEMA 1997a: xif). However, they are not on the fringes but even track quite well to any other former critical approach such as sustainable development or the *basic needs* approach.⁵⁵ Yet, former critiques such as f.i. *dependencia* theories laid their focus of critique on the lack of importance of certain topics, e.g. global inequalities. From post-development perspective the various theories of alternative development are accused to cleave to the implications of *modernization* theory, that is the assumption that the North is already developed while the South still is in need of development. Therefore development is criticized on three levels: as a political project, as a conceptual structure (discourse, ideology, system of representations) and as strategy. (ZIAI 2006a: 98) It is the perspective, the applied methodology of analysis, as well as the rejection of development what sets post-development critiques apart from other development critiques (ESCOBAR 1995: 215f).

Methodologically, post-development often uses FOUCAULTIAN discourse analysis as methodological tool for analysis of the development discourse whereby discourse is understood as "not [being] the expression of thought; it is a practice, with conditions, rules and historical transformation" (ESCOBAR 1995: 216). According to ESCOBAR, post-developmentalism's methodical intention is to find "ways of producing change without transforming the nature of the discourse as a whole" (ESCOBAR 1995: 216). ZIAI stresses that

a total rejection of development efforts, whereas 'beyond development' represents a position of anger about conventional development policies whilst seeking local alternatives. 'Post-development' tries to combine those perspectives "with a FOUCAULTIAN methodology of discourse analysis and a theory and politics inspired by post-structuralism". (NEDERVEEN PIETERSE 2009: 339).

⁵² "Through postdevelopment runs an antiauthoritarian sensibility, an aversion to control, and perhaps an anarchist streak." (NEDERVEEN PIETERSE 2009: 341)

⁵³ There is no consensus about standard criticism of post-development since the post-development debate "has brought together practitioners and academics from many social science disciplines and fields" (ESCOBAR 2007: 18) who give differing emphases to varying points of criticism. According to ZIAI a 'neo-populist' model with more radical demands for the rejection of modernity and the return to subsistence economy (cf. RAHNEMA with BAWTREE 1997) competes with a 'skeptical' model which has a moderate attitude towards the *romantization* of traditional cultures. The latter is characterized by less anti-modern critical attitudes and claims for more radical democracy (cf. ESCOBAR 1995, ESTEVA 1992/2010). (ZIAI 2006a: 107ff.)

⁵⁴ RAHNEMA defines 'subversive' as "[...] turn[ing] a situation round and look[ing] at it from the other side"; 'human-centred' means "a perception of reality from the perspective of the human beings involved in the process of change"; while 'radical' means "going to the roots of the question". (RAHNEMA 1997a: xif)

⁵⁵ "Postdevelopment overlaps with Western critiques of modernity and technoscientific progress." (NEDERVEEN PIETERSE 2009: 339)

post-development studies correctly define development as a discourse of historically developed structures which are influenced by social interests and power relations but he critiques that post-development's relation to FOUCAULT was similar to the relation between Marxism-Leninism to MARXS's works (ZIAI 2006a: 16): "Although they hardly live up to discourse-analytical demands in the sense of Foucault, they point to rarely regarded aspects with respect to theory and practice of 'development' in the post-war era of the 20th century" (ZIAI 2006b: 198, own translation). However, the citation of FOUCAULT and discourse analysis induces that post-development approaches attribute considerable attention to the way *how* we discuss development and the 'Third World' instead of dismissing it as a superstructure phenomenon. (ZIAI 2006b: 198, own translation) This unusual and radical critical perspective "seem[ed] to have had serious impact on the academic discussion during the 1990s" (ZIAI 2007: 3).

2.2 Post-development critique on conventional development strategies

"From the unburied corpse of development, every kind of pest has started to spread. The time has come to unveil the secret of development and see it in all its conceptual starkness." (ESTEVA 2010: 1). This statement opens up three dimensions of *post-development* critique. First of all, critique is addressed to the misconception and associated perversion of the primary intention of the development paradigm. Secondly, the uncritical pose to traditional development ideas, i.e. the non-questioning of the uncontested benefit of development and a cultural 'Westernization', are made a subject of discussion. Thirdly, development is suspected to have concealed intentions - in SACHS's words a 'hidden agenda' - regarding global power relations. (see ESTEVA 2010) These three entangled points of criticism will be explained more detailed in the following.

Post-development proponents consistently critique the persistent vagueness of the term development due to the various paradigm shifts and redefinitions it has experienced. ESTEVA describes it as a word "with contours that are about as precise as those of an amoeba" (ESTEVA 2010: 6). SACHS characterizes the conventional development concept as "[...] shapeless but ineradicable. Its contours are so blurred that it denotes nothing [...]." (SACHS 2010: xix). Furthermore, development discourse is accused to sustain a concept that justifies a number of interventions: "Though development has no content, it does possess one function: it allows any intervention to be sanctified in the name of a higher goal. [...] It is our intention [...] to clear out of the way this self-defeating development discourse" (SACHS 2010: xix). ESTEVA states that due to the vague definition, development has been misconceived and that development was the reverse of what was traditionally understood by this idea since it rather represents the cause of any problem of developing countries instead of their solution. The misconception was initiated by President TRUMAN who 'changed the meaning of development' in his famous inauguration speech on 20 January 1949 when he heralded the

'era of development' as an 'era of American hegemony' (ESTEVA 2010: 2)⁵⁶. SACHS specifies ESTEVA's notion. He understands development as a historically and discursive grown ideology with 'perceptual biases', 'historical inadequacy' and 'imaginative sterility' (SACHS 2012: xvi) which "cannot be separated from the idea that all peoples of the planet are moving along one single track towards some state of maturity, exemplified by the nations 'running in front'." (SACHS 2010: xviii). For the worlds' disadvantaged the development idea was made tempting as a process of progress and modernity which is not only worth imitating but necessary in order to overcome a traditional, i.e. non-progressive existence. SACHS takes the view that under the pretext of development the North has had pursued a 'hidden agenda' from the start. This 'hidden agenda' was "nothing else than the Westernization of the world." (SACHS 2010: xviii), i.e. shaping the world according to Western/ European ideals.

Beyond conventional development approaches' discrimination of traditional communities in developing countries as deficient and retarded, SACHS additionally critiques their non-recognition as "living diverse and non-comparable ways of human existence" (SACHS 2010: xviii). Development thus was misused as the permission to constraining the right of cultural self-determination. RAHNEMA denotes development as an 'ideology' threatening people's autonomy in societies where development has been introduced (RAHNEMA 1997a: x). He accuses development for never having seriously consulted the target groups (the 'ruled' or the 'have-nots') and never having asked for the needs at the grassroots level. Therefore, development resulted in a 'deceitful mirage': under the banner of progress development is accused to have ended in exclusion and discrimination instead of liberation. Masses were made to forget age-old cultural traditions of communal solidarity which have been replaced through modern values such as individual success. Albeit for the majority modern comforts remained unattainable. (RAHNEMA 1997a: ix) SACHS calls this a 'loss of cultural diversity' that resulted in a dangerous 'cultural monoculture'⁵⁷ (SACHS 2010: xviii).

A large number of post-development proponents share this view of 'cultural imperialism' and 'Westernization'. RAHNEMA f.i. has a more radical view and describes 'Westernization' as a 'dis-valuation'⁵⁸ of the vernacular cultures, i.e. of indigenous know-how and knowledge systems (RAHNEMA 1997b: 122f). He equalizes the spread of development ideas and practices with the mode of action of the HIV virus which "penetrates into people's minds" (RAHNEMA 1997b: 119) and "[o]ften, it has turned them into their own enemies, once they have internalized the developers' perception of what they need." (RAHNEMA 1997c: 391). Furthermore, he states that this "internalization by the host, like that of the AIDS virus" was

⁵⁶ According to ESTEVA, TRUMAN polarized world society into two categories: developed and underdeveloped countries. By using the word 'underdeveloped' in his speech for the first time 2 billion people had become underdeveloped all at once. (ESTEVA 2010: 1f)

⁵⁷ "The mental space in which people dream and act is largely occupied today by Western imagery." (SACHS 2010: xviii)

⁵⁸ "Coined by IVAN ILLICH, the word 'disvalue' 'bespeaks the wasting of commons and culture with the result that traditional labour is voided of its power to generate subsistence'." (RAHNEMA 1997b: 123)

"the 'power' of development" (RAHNEMA 1997b: 119). For SACHS the "tremendous loss of diversity" gives cause for serious concern since "[t]he spreading monoculture has eroded viable alternatives to the industrial, growth-oriented society and dangerously crippled humankind's capacity to meet an increasingly different future with creative responses."⁵⁹ (SACHS 2010: xviii).

ESCOBAR has a more differentiated view. He considers the elimination of traditional cultures (= 'Westernization') as a simplified polarization between "tradition and modernity, dominators and dominated" (ESCOBAR 1995: 219): "Rather than being eliminated by development, many "traditional cultures" survive through their transformative engagement with modernity" (ESCOBAR 1995: 219). ESCOBAR agrees on a loss of traditions through modernity but he rather complains about more differentiated processes of 'hybridization' that Latin America experienced:

"Neither on the way to the lamentable eradication of all traditions nor triumphantly marching toward progress and modernity, Latin America is seen as characterized by complex processes of cultural hybridization encompassing manifold and multiple modernities and traditions." [...] "The hypothesis that emerges is no longer that of modernity-generating processes of modernization that operate by substituting the modern for the traditional but of a hybrid modernity characterized by continuous attempts at renovation, by a multiplicity of groups taking charge of the multitemporal heterogeneity peculiar to each sector and country"

(ESCOBAR 1995: 218)

Hence, ESCOBAR considers those 'hybrid experiences' among popular groups as successful in the sense of offering innovation potential whereby the new difficulties lie in the challenge to "transform their practices in the face of modernity's contradictions" (ESCOBAR 1995: 219).

Another point of post-development criticism is the unsoundness of mainstream development policies regarding ecological sustainability, and thus the questioning whether the industrialized Northern countries can continue being accepted as a desirable, advanced or even superior model for development:

"After all, with the fruits of industrialism still scarcely distributed, we now consume in one year what it took the earth a million years to store up. [...] If all countries 'successfully' followed the industrial example, five or six planets would be needed to serve as mines and waste dump. It is thus obvious that the 'advanced' societies are no model; rather they are most likely to be seen in the end as an aberration in the course of history."

(SACHS 2010: xvif)

⁵⁹ What SACHS is referring to is a socio-cultural dislocation of traditional societies through modernization, i.e. through "[t]he campaign to turn traditional men into modern men" (SACHS 2010: xviii) that has cut off knowledge and capacity to create alternative responses to modern challenges: "[traditional men] are forced to get by in the no-man's-land between tradition and modernity" since "[t]he old ways have been smashed, the new ways are not viable." (Ibid. 2010: xviii). He also critiques the enforcement of Southern countries by Northern countries to participate in a global economic competition of 'advanced technologies', a 'kind of race' where the rich countries are supposed to having to put forth in order to maintain their superior position. According to Sachs, this socio-economic competition continues until today in the context of globalization. (Ibid. 2010: xviif)

Post-development hence does not deny the power of development *per se*. To the contrary, development entails great potentials since it "has changed the face of the earth" (SACHS 2010: xvii). In this respect development is not regarded as total failure: "[...] it is not the failure of development which has to be feared, but its success" (SACHS 2010: xviii). According to SACHS the danger of development success lies in the fact that the "promise of development has been turned upside down" (Ibid. 2010: xvii) with the result that success was not really granted to the disadvantaged: "In 1960, the Northern countries were twenty times richer than the Southern, in 1980 forty-six times richer. [...] Of course, most Southern countries stepped on the gas, but the North outpaced them by far."⁶⁰ (Ibid. 2010: xvii)

With respect to global competition, post-development critiques are generally questioning regional power relations, i.e. the international dominance and control in development policies: "[...] they [conventional development policies, own remark] impose science as power, inflict cultural Westernization and bring environmental destruction. They are rejected not merely because of their results but because of their intentions, worldview, and mindset." (NEDERVEEN PIETERSE 2009: 339) Moreover, post-development approaches argue that "instead of creating a fairer world, development can only serve to perpetuate uneven power relationships." (MCKINNON 2007: 772). It was ESCOBAR who introduced development as a 'discourse of domination' (ZIAI 2006a: 19) that represents a stepwise established system of relations and a process through which social reality comes into being and where space for articulation of knowledge and power is created. According to ESCOBAR, such mechanisms of power served for producing and managing ('controlling') the 'Third World'. This means that development discourse gradually "has created an extremely efficient apparatus for producing knowledge about, and the exercise of power over, the Third World" (ESCOBAR 2005: 19, own translation). In this process the 'rich' countries possessed the leadership position and had "the power, knowledge, and experience to decide on what was to be done" (ESCOBAR 1997: 87). Thus, their approaches, concepts and policies became 'instruments of power and control' (ESCOBAR 1997: 88):

"In sum, the system of relations establishes a discursive practice that sets the rules of the game: who can speak, from what points of view, with what authority, and according to what criteria of expertise; it sets the rules that must be followed by this or that problem, theory or object to emerge and be named, analysed, and eventually transformed into a policy or plan." [...] "Some clear principles of authority were in operation. They concerned the role of experts, from whom certain criteria of knowledge and competence were asked; institutions such as the United Nations, which had the moral, professional and legal authority to name subjects and define strategies; and the international lending organizations, which carried the symbols of capital and power." [...]

(ESCOBAR 1997: 86f)

This mechanism of power opens up scrutiny to the perpetuation of uneven power relations through professionalization and institutionalization whereas Western standards dominate the development discourse since it "involves telling other people what to do in the

⁶⁰ "Social polarization prevails within countries as well." (SACHS 2010: xviii)

name of progress, modernization, nation building, mobilization, sustainable development, human rights, poverty alleviation, empowerment, and participation (participatory management)" (NEDERVEEN PIETERSE 2009: 341). Besides the general anti-interventionist and anti-managerialist attitude the above array of arguments gives evidence to a general anti-modern attitude of post-development proponents.

The anti-modernism features of post-development stick out very clearly in RAHNEMA's miscellany *The Post-Development Reader* (RAHNEMA with BAWTREE 1997). RAHNEMA characterizes non-developed societies, i.e. 'vernacular spaces' or 'pre-modern societies', as the genuine opposite of 'modern economized societies' and attributes to them positive dispositions such as the capacity for 'human solidarity', 'dignity', 'reciprocity', etc. (RAHNEMA 1997b: 113f). Implicitly, he assumes that in modern societies those positive dispositions have been forgotten or lost. RAHNEMA is well aware that such 'pre-modern' societies should not be idealized and he stresses that "[t]hey constitute challenging spaces, often full of strongly conflicting fields of interest, loaded with mutual fears, suspicions and violence. Deprivations of all kinds, different forms of domination and subjugation, of imposed as well as voluntary servitude, have been the constant companion of men and women in these societies." (RAHNEMA 1997b: 114) However, they are assumed to possess a 'unique set of practices and approaches' that preserves and reinforces their social 'immune system'. RAHNEMA defines this social 'immune system' as the "own autonomous capacity to live and defend themselves against foreign aggression" (RAHNEMA 1997b: 114). RAHNEMA's point is that the self-preservation and autonomous capacity for defense enables 'pre-modern societies' to resolve their problems by their own through 'collective apprenticeship', through the return to traditional values as well as through self-recovery (RAHNEMA 1997b: 115). He consequently claims for the orientation on problem-solving capacity of traditional societies:

"This is not to say that they [pre-modern societies, own remark] were 'better', or that we should go back to a 'state of Nature' - a prospect that would be neither desirable nor feasible. Nevertheless, a deeper and unbiased knowledge of how different cultures have solved their problems and of what they learned to cherish or dislike through the ages would be instructive for all those in search of alternatives to our own dilemmas."

(RAHNEMA 1997c: 381)

In doing so, RAHNEMA appeals to 'future Davids' (the societies that are considered as necessitating development) to defend themselves against the manipulating 'modern Giant' of development and to trust in their own strength of problem solving: "The only chance for future Davids to thwart the modern Goliath is not only to understand the true nature of development's objectives and cunning strategies, but, even more important, to engage in the demanding work of self-exploration, which requires faith in one's own truth and strength." (RAHNEMA 1997b: 128)

2.3 Objectives of post-development

The particularity of post-development criticism is that it challenges the underlying premises of development and the development idea *per se*: "they are interested not in development alternatives but in alternatives to development, that is, the rejection of the entire paradigm altogether" (ESCOBAR 1995: 215). For this purpose, post-developments' suggestions focus on "forms of resistance to development", that is, "the defense and promotion of localized, pluralistic grassroots movements" (ESCOBAR 1995: 215). It generally has an "interest in local culture and knowledge" and in taking up "a critical stance with respect to established scientific discourses" (Ibid. 1995: 215). Finally, ESCOBAR imagines "the end of development as a regime of representations" (Ibid. 1995: 215): "Development unmade means the inauguration of a discontinuity with the discursive practice of the last forty years, imagining the day when we will not be able to say or even entertain the thoughts that have led to forty years of incredibly irresponsible policies and programs" (Ibid. 1995: 217). Simultaneously, he recognizes that "[t]he process of unmaking development, however, is slow and painful and there are no easy solutions or prescriptions" (Ibid. 1995: 217).

For there are no "grand alternatives that can be applied to all places or all situations" ESCOBAR himself raises the question: "Where, then, lies "the alternative"?" (ESCOBAR 1995: 222). ESCOBAR clarifies the position that alternatives can neither be formulated at an abstract, macro level; nor can they be formulated only in intellectual academic circles but on grassroots level because the grassroots groups are to be considered as the origin of resistance to development. Thus, they unlock a potential in articulating alternatives through their self-dependent capability of resistance and translation of contradictions between modernity and tradition into hybrid solutions: "Out of hybrid or minority cultural situations might emerge other ways of building economies, of dealing with basic needs, of coming together into social groups" and "[t]his might offer unexpected opportunities that groups at the margin could seize to construct innovative visions and practices" (ESCOBAR 1995: 225). The new role of development discourse lies in a "new reading of popular practices" (Ibid 1995: 223), that is, empowering individuals or groups for "collective construction of alternatives" (Ibid 1995: 226). Those grassroots social movements, "in their common struggle to reclaim politics from the state, economy from the market and knowledge from science, can only be understood as essentially post-development" (SIEMIATYCKI 2005: 60).

2.4 Critical considerations on post-development critiques

Post-development studies have been strongly critiqued for various statements. By rejecting modernity and development, post-development is accused to ignore achievements of development practice, for instance individual human rights, improvements in healthcare,

reduction of infant mortality, reduction of poverty levels and so forth (ZIAI 2006a: 101f.). Additionally, the delimitation of case studies in Africa, Latin America and South Asia reveals its narrow attitudes towards development. The positive experiences of China, East and Southeast Asia and newly industrialized countries are ignored (NEDERVEEN PIETERSE 2009: 341f). According to ZIAI, the standard general reproaches that post-development publications are facing range from accusing post-development for being a "cynical legitimization for neoliberalism" (ZIAI 2006a: 101, own translation)⁶¹ or "useless romanization of pre-modern times" (ZIAI 2006a: 101, own translation). In the following, three major points of critique are addressed: post-development's *romantization* of 'pre-modern societies', the fact that post-development voices critique but does not offer tangible practical solutions, and the paradoxical attitudes towards development.

Some *post-development* approaches are accused to display an uncritical and idealistic perception of life in pre-modern societies and project romantic images on the often relentless reality of such 'alternatives to development' (ZIAI 2006a: 102). It is strongly critiqued that pre-modern subsistence societies were not considered in the same critical way as post-development considers modern societies. Besides, they are often constructed as spaces free of power relations and conflicts. Yet, according to FOUCAULT, this turns out to be an illusion since power relations are omnipresent and therefore prevail also in local small-scale communities and discourses or practices.⁶² (ZIAI 2006a: 18) This critique of the *romantization* of pre-modern societies does not extend to authors such as ESCOBAR or RAHNEMA who show a more sophisticated perception of spaces free of power by accentuating the importance of avoiding both extremes, i.e. "to embrace them ['vernacular spaces'] uncritically as alternatives; or to dismiss them as romantic dispositions" (ESCOBAR 1995: 170; RAHNEMA 1997b: 114). ESCOBAR even accentuates a compromise between modernization and tradition through combining advantages of modern comforts while being inspired by elements of tradition (such as social and ecological harmony or maintenance of cultural values) in order to invent new ways of life. (ESCOBAR 1995: 218; ZIAI 2006a: 106)

Most of the post-development approaches are also criticized for not offering a concrete alternative *to* development and *for* social change, despite their demand for it: post-development's program of offering '[a]lternatives to development' "is a misnomer because no alternatives to development are offered. There is critique but no construction, resistance but no transformation." (NEDERVEEN PIETERSE 2009: 343). With regard to practical issues "[p]ost-development theory has failed, in a direct sense, to put food in the mouths of the

⁶¹ The affinity between post-development and neoliberalism emerges through core ideas that they have in common, such as the rejection of development assistance, counting on civil society and their capacity for self-help instead of building on strong states which in reality often turn out to be 'failed states', questioning the material conception of prosperity, and thus, questioning principally the necessity of redistributive processes. (cf. NEDERVEEN PIETERSE 2009: 342; ZIAI 2006a: 101)

⁶² With the unconditional reference to cultural diversity and traditional societies post-development indirectly accepts possible existing oppression and violence in such societies particularly against women and children (e.g. female circumcision or domestic violence). (ZIAI 2006a: 102f)

hungry, to put roofs above the homeless or to put money in the pockets of the penniless." (SIEMIATYCKI 2005: 60). Post-development indeed emphasizes on alternative topics such as grassroots movements, collective solidarity, informal economy, indigenous knowledge, cultural diversity, direct democracy etc., but none of these is specific to post-development but they can rather be traced back to suggestions for improvement of other critical concepts to mainstream development; nor do they have rejection of development as a logical consequence. (NEDERVEEN PIETERSE 2009: 340ff.) To the contrary, post-development approaches are criticized for delivering just another blueprint of the constitution of a better society likewise mainstream development does with the distinction that post-development builds its vision on reciprocal leitmotifs as per antimodernist and anti-Western values and practices. In the end, post-development dictates a way of life in the same authoritarian way as the concept they attack. (ZIAI 2006a: 30 and 102; NEDERVEEN PIETERSE 2009: 341ff.)

This can be considered as one of the several paradoxical views that post-development studies display. Another one is f.i. the implicit assumption that mainstream development is solely considered as a practice of the North while the South is not conceded to do development practice. Moreover, in post-development critiques the world's poor "are often presented as incapable of acting in their own interests and as preventing development experts from helping them" (NEDERVEEN PIETERSE 2009: 339) while they are at the same time assumed to naturally have the best self-defending capabilities. It may be true that traditional societies' self-defending capacity has been lost through the former 'imperialistic mode of action' of development policies. Yet, this interjection raises the question why social immune systems of the respective traditional societies have not been able to defend themselves against the 'invasion' of conventional development ideas in the past. In the light of this attitude one can ask how post-development can be seeking for endogenous control of development whilst local people at the grassroots are assumed to lack all skills of self-organization, emancipation and power to take over. Additionally, post-development's concentration on self-regulating forces as problem solver can impede the improvement of the poor's situation since it "lets the development responsibility of states and international institutions off the hook" (NEDERVEEN PIETERSE 2009: 342).

Another paradox can be described on linguistic level by criticizing post-development for "essentializing development" (NEDERVEEN PIETERSE 2009: 341; ZIAI 2006a: 17): on the one hand, post-development points out the amoeba-like character of the term development due to its various redefinitions and paradigm shifts in the past, while on the other hand, post-development refers to development in an unequivocal negative way:

"'Postdevelopment' is misconceived because it attributes to 'development' a single and consistent meaning which does not match either theory or policy and thus replicates the rhetoric of development rather than penetrating its polysemic realities. It echoes the 'myth of development' rather than leaving it behind."

(NEDERVEEN PIETERSE 2009: 343)

Furthermore, post-development's dichotomic thinking disregards the dialectics and changes in direction of the development discourse during the last forty years which is also shaped by critiques from the South: Post-development "shows no regard for the progressive potential and dialectics of modernity, for democratization, soft power technologies, and reflexivity." (NEDERVEEN PIETERSE 2009: 342).

2.5 Potentials of post-development critique: radical democracy

Meanwhile, although some post-development critiques may still appear peculiarly today post-development critique is broadly accepted as legitimate since it has a potential to point on weaknesses of development discourse, particularly to the domination of a Eurocentric perspective. Despite its exaggerations and generalizations, post-development's critique turns out to be innovative and thus profitable. (ZIAI 2006a: 30f) The goal setting of post-development was often criticized as well as the lack of the construction of alternative politics. This might be interpreted as unconstructive critique but if thought consequently, it is a corollary since abstaining from the suggestion of alternatives, in fact, does not set limits to the creative self-organization and self-development of grassroots groups:

"If the authoritarian and ethnocentric elements of development theory and policy are supposed to be avoided, it is impossible to define development in a normative way (as a state of a 'good society' or as a process that results in such a state). This definition can only be legitimately defined by the affected people and through democratic discussion."

(ZIAI 2006b: 207)

Even though there is indeed potential for unprogressive-populist interpretations, post-development can be acknowledged as a program of radical democracy in the sense of determining development ideals autonomously at the roots, that is focusing on a: "re-valorization of vernacular cultures, the need to rely less on expert knowledge and more on ordinary people's attempts at constructing more humane and culturally and ecologically sustainable worlds, and the important point of taking seriously social movements and grassroots mobilizations as the basis for moving towards the new era" (ESCOBAR 2007: 20).

In the end, albeit being vague, post-development suggests at least alternative procedures: for instance the decentralization of power structures, or more precisely, the transfer of decisive power to local scale. Insofar, post-development points out potentials for emancipation as well as for critical discussion on future development theory and practice:

"[P]ostdevelopment theory can be recognized as succeeding in empowering individuals who strive to create a better life for themselves and those around them. That being said, the potential for post-development theory to conceive of, and ultimately execute, an organic system of culturally sensitive, community-oriented improvement - or 'real development' - can only be realized with the further engagement of those indigenous and marginalized knowledges which promote diversity, equity and justice."

(SIEMIATYCKI 2005: 60)

Summary Chapter 2

Different critical studies about conventional development concepts and theories have been subsumed under the term post-development. Its particular critique on epistemology, implicit assumptions of the development discourse, and the rejection of development practices set it apart from previous development critiques. Post-development defines development as a discourse of domination, and it uses discourse analysis as a tool for the analysis of the development discourse. According to post-development, the adoption of a new critical perspective intends to allow for the imagination of courageous and creative responses to development problems and for the inducement of social change. Summarized, post-development criticizes conventional development discourse on three levels: as a vague term, as political project, and as ideology.

First of all, post-development accuses the 'amoeba-like' term development to have opened the way for fatal misconception of the development idea by developed Western countries who are accused to have misused it as a basis for the perpetuation of unequal power relations and in order to globally disseminate a model of society according to Western moral values and Eurocentric growth-oriented economic standards ('Westernization' as 'hidden agenda'). Still, this biased and apparently unquestioned mainstream concept of development seems to be predominant in international development discourse. A majority of post-development publications criticizes this concept for a non-recognition of the self-dependent solution finding capacities of countries which are affected by problems of underdevelopment. Thus, focusing on grassroots movements and on the (re-)valorization of local traditional culture and knowledge are major aspects of 'alternatives to development'.

Due to its radical attitude, post-development attracted a number of critiques such as the uncritical and idealistic *romantization* of traditional societies, showing paradoxical attitudes, offering criticism but no construction of alternatives, and disacknowledging the dialectics in development discourse. Nevertheless, post-development's potentials are also acknowledged. Its demand for transferring more decisive power to the local people, its disclosure of weaknesses of the conventional development ideal, and the suggestion to open spaces for endogenously defined *bottom-up* alternatives to development (f.i. claims for radical democracy, decentralization of power, and emancipation) found considerable attention in the development discourse.

However, transferring decisive power to the 'subaltern' is not an entirely new idea but it has already been aimed at by alternative approaches of traditional development practice under the keyword 'participation' (cf. ZIAI 2006b: 215). Participatory development planning and research try to include the local protagonists - especially rural and urban disadvantaged - in development or research projects from the beginning (e.g. CHAMBERS

1997). Yet, this endeavor sets a challenging task to development research and practice as it will be explored in the following.

3. Participation

The core issue of this study is the evaluation of participatory methods that were applied during a *Participatory Technology Development* (PTD) activity in Central India. It aims on the analysis of potentials and limitations with regard to the power to motivate local participants for participation in participatory research and for their sustainable empowerment in other spheres of social life (see Part III: Empirical Part). The overarching review of participation was approached through general reflections about development and the *post-development* critique which represents a radical claim for popular participation, particularly in traditional (rural) communities. At this point, the subject has to be narrowed, despite the universal perspective of this paper⁶³. Since the case study took place in a rural context, the participation perspective will emphasize on rural development issues. Furthermore, the angle can additionally be narrowed to considerations on *Participatory Action Research* (P(A)R). P(A)R in an agricultural context is *Participatory Agricultural Research* (PaR) which is represented by the both concepts *Farmer Participatory Research* (FPR) and *Participatory Technology Development* (PTD). There can even be made another specification since reference to agriculture in this context is mostly restricted to *Low External Input Sustainable Agriculture* (LEISA) and organic agriculture⁶⁴.

In this chapter, a general outline about participation in development discourse⁶⁵ and its constraints will be given. Thereby, a holistic perception of participation is taken as a basis⁶⁶, i.e. including political and social dimensions of development. The analysis of motivation for participation in *Participatory Agricultural Research* (PaR) on individual level will be approximated gradually.

⁶³ The universal perspective and the application of the broad perspective on a small scale requires a challenging and steady alternation of broadening and narrowing of the issue, that is an ongoing compromise between detailed and sketchy considerations.

⁶⁴ LEISA is oriented on agroecology (the fusion of conventional agricultural science and ecology) and takes natural ecosystems as model for sustainable agricultural farming systems. So-called agroecosystems are assumed to combine agricultural production with natural ecosystems and their capacity of constantly changing and being adapted to environmental constraints with the less external inputs as possible. Accordingly, LEISA intends to use items and materials that are locally available instead of looking for expensive external farming inputs (chemical fertilizers, pesticides, insecticides). Hence, LEISA is a sustainable farming systems approach that shows parallels to organic farming. (cf. REIJNTJES et al. 1994: 56ff.)

⁶⁵ The understanding of discourse at this point rather emphasizes on experiences from development practice and should be understood as a "specific set of interventions" or "a version of 'participation in projects'" (HICKEY & KOTHARI 2009: 82) but it also includes conceptual reflections similarly to the definition of development discourse in the preceding chapters.

⁶⁶ For this purpose, the comprising terms 'participation' or 'participatory approaches' are frequently used in the following in order to include all possible variations of participation approaches.

3.1 Chronology of participation

Participatory approaches in development discourse emerged in the 1970s⁶⁷ out of the impasse of conventional, usually top-down, technocratic, state-led blueprint development mainly as a response to ineffectiveness and inefficiency of development research and practice⁶⁸. Participation is often associated with claims from alternative development approaches such as *basic needs* concepts, *sustainable livelihoods* and human rights-based approaches which since the 1970s began to stress the importance of *grassroots* development, i.e. focusing on local scale, empowering local people in *decision-making* and intending to integrate local indigenous (technological) knowledge into program planning. This was expected to bring a change in the balance of power of stakeholders. (HICKEY & KOTHARI 2009: 82) Hence, participation in development is associated with *bottom-up*, people-centered, process-oriented benefits and in a broader sense with democratization, decentralization, institutional issues of governance, and with the sustainability of interventions. (HICKEY & MOHAN 2004: 4)

In the context of paradigm shifts in development discourse, participation has also undergone various paradigm shifts and trends: from the recognition of the need for participation in the 1970s/ 1980s to a 'boom' in the 1980s/ 1990s, particularly with the dissemination of the most popular methodology *Participatory Rural Appraisal* (PRA) (see CHAMBERS 1983, 1992, 1997). Since the early 1990s, participatory approaches have spread from development practice to agricultural research and rural development where farmers' participation is a major issue (VEL et al. 1996: 151). Thereafter, during the 1990s, at the peak of its fame, participation became conditionality for funding in development cooperation and research. As a result, participatory methodologies experienced commonplace application and widespread mainstreaming. HICKEY & MOHAN critically remark that the notion and practice of participation had its origins in some academic and practitioner circles and that they had moved virtually unchecked from the margins to the mainstream of development (HICKEY & MOHAN 2004: 3). Today, participation continues to be a key concept in international development and research, and actually even extended its role, despite existing debates about insufficient evidence about whether participatory approaches were living up to the promise of empowerment and transformative development for marginal people (HICKEY & MOHAN 2004: 3).

⁶⁷ In fact, the participation idea within development theory and practice has its origins already in the 1940s when "community development" was already promoted by Colonial Powers such as the United Kingdom. Gradually, the approaches which identified participation as a key element of their projects diversified over the years and varied in its political, social, economic or ecological emphasize. (HICKEY & KOTHARI 2009: 82)

⁶⁸ "At present there is widespread consensus that effective beneficiary participation is indispensable to render a project successful." (VAN HECK 2003: 7)

3.2 Dimensions of participation

At a first glance, participation appears as a clear notion but in fact this is not the case. There is a wide range of definitions and interpretations of participation as well as a wide range of approaches of how to bring participation into practice. The approaches vary in their trajectory, methodology and specific context, and they are characterized by particular debates and empirical experiences. While some approaches have continued, others have petered out, and the success of each approach was dependent on politics and political economy surroundings. Particularly the recent mainstreaming approach of 'participation in development' is linked to such socio-political surroundings and is assumed to focus rather on participation in projects than in broader political contexts. (HICKEY & MOHAN 2004: 5; PASTAKIA et al. 2002: 1) The contextual focus of participation ranged from participation as the political right and obligation of citizenship in the 1940s/50s, to emancipatory or liberating participation as a means to challenge subordination and marginalization in the 1970s/80s, to participation in development as project participation for sustainability and effectiveness/efficiency of interventions since the 1980s onwards, and simultaneously back to participation as a right and obligation of citizenship that aims on practicing social democracy, justice and participatory governance since the late 1990s onwards. (cf. HICKEY & MOHAN 2004: 5ff.)

Furthermore, participation can be practiced in different spheres of social environment. It can take place as political participation in terms of contribution to political processes⁶⁹, as social participation⁷⁰ in terms of sharing physical and cultural commodities, and as active involvement⁷¹ in the development process (NOHLEN 2000: 606f). The GERMAN FEDERAL MINISTRY FOR ECONOMIC COOPERATION AND DEVELOPMENT (BMZ) defines participation in a more encompassing way, both as product and process adding to it the specifications of 'empowerment' and 'ownership' which are both closely related objectives as well as preconditions for participation:

"Participation is an important formal principle of the German development cooperation. It stands for active and significant involvement of people (demographic groups, organizations, associations, parties) into every decision which affect their lives. Participation contributes to the articulation and assertion of interests of target groups and partner organizations in development cooperation (empowerment). Moreover, participation implies that people contribute with their experiences and their moral values in the joint work. Thus, they adopt the project as their own and assume responsibility for the project's success (ownership)."

(BMZ 2010-12, own translation)

The multifacetedness of participation actors/ addressees, spheres and contexts finds expression through various designating synonyms of participation as it can be observed f.i. in German development jargon: there, participation is equivalent to expressions such as

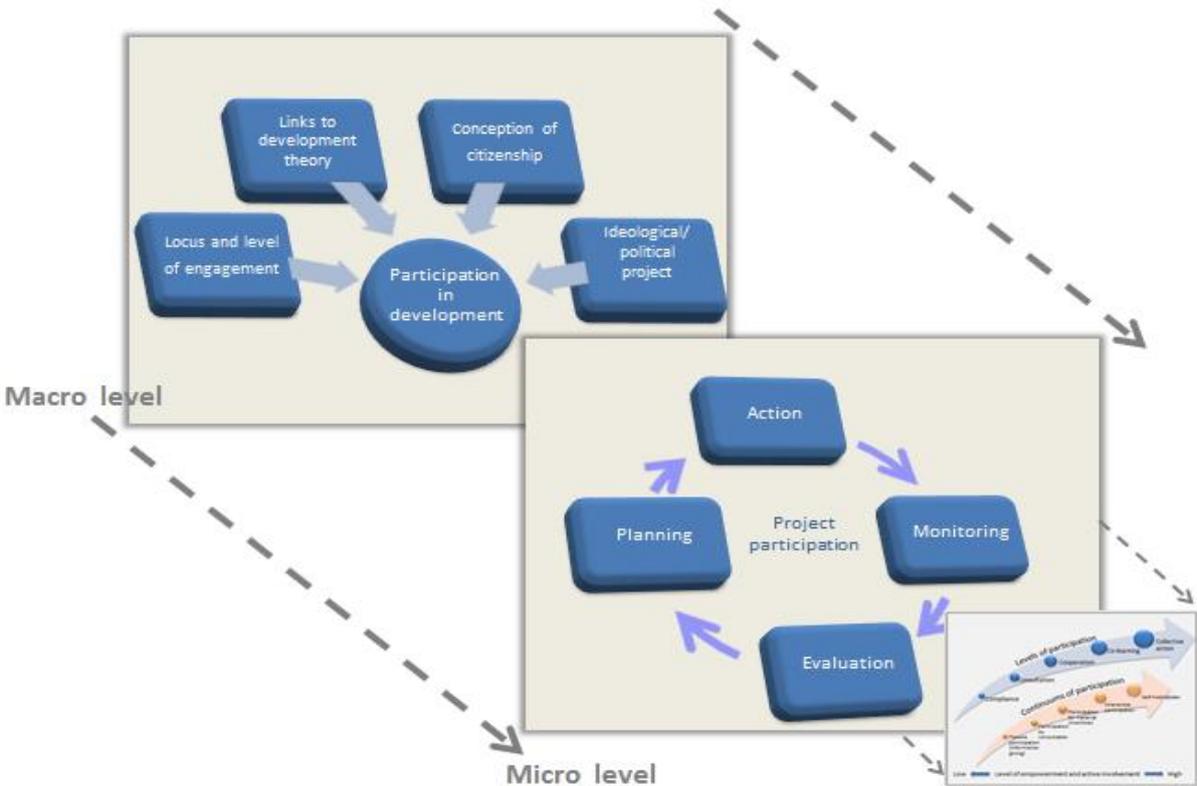
⁶⁹ This component of participation comes along with democratization and political decentralization of power.

⁷⁰ This component of participation is associated with distributive justice.

⁷¹ This component aims on the contribution to development efforts.

"Beteiligung", "Teilhabe", "Mitwirkung", or "Einbeziehung" which correspond to the English expressions involvement, sharing, contribution and inclusion. HICKEY & MOHAN tried to condense this broad and vague perception. They distinguish at least four ways in which different approaches of participation can be generally characterized and compared on macro level. According to the authors, participation is motivated by ideological or political intentions, it can be analyzed through the underlying conception of citizenship, or it can be considered according to its linkage to development theory, and finally, it can be characterized by its locus and level of engagement. Analyzing participation along these axes allows for more clarity about the type and purpose of participation. (HICKEY & MOHAN 2004: 9) Considering these features, participation can tremendously vary according to the respective intention and interpretation or political project of scientists, administrators or practitioners. Moreover, on micro level, participation is rather associated with project participation where the participation of target groups can vary according to the stage of the project cycle. Depending on the project phase it encompasses participatory planning methodologies, participatory acting/ implementing methodologies, participatory monitoring methodologies, and evaluation methodologies (see CENTRE FOR DEVELOPMENT INNOVATION (CDI) 2004-2010). Figure 6 illustrates the various purpose and stages of participation or motives for participation from macro to micro level as they were explained above:

Figure 6: Purposes, motives, and stages of participation in development



Source: ZAHUMENSKY 2013, partially adapted from CENTRE FOR DEVELOPMENT INNOVATION (CDI) 2004-2010; HICKEY & MOHAN 2004: 8f

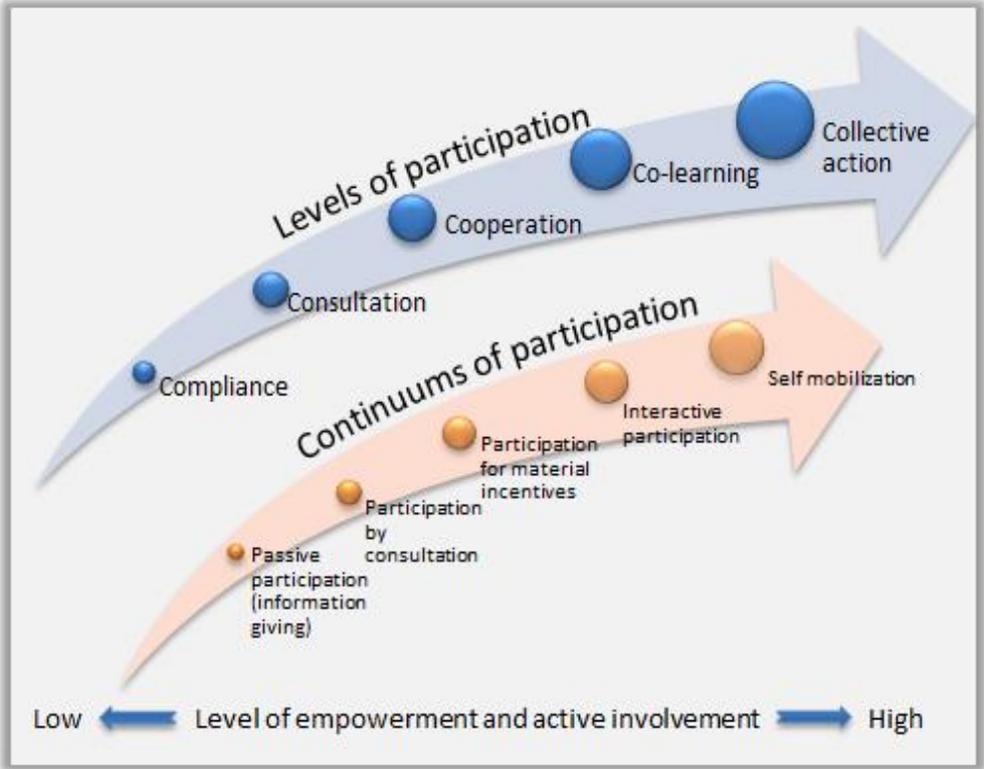
Repeatedly, there are fundamental debates about whether participation is a means (i.e. focusing on the participatory processes) or an end (focusing on participation as product) (COOKE & KOTHARI 2004: 6). Understanding participation as a process means looking at relationships, ways of conceiving knowledge, as well as dealing with type and intensity of stakeholders' or beneficiaries' active involvement in the participatory process. Participation as process is thus associated with empowerment arguments and the enhancement of the capacity of individuals to improve or change their own lives. Besides, participation on product level addresses the relation to practice and outcomes. Participation as a product is related to efficiency arguments whereby participation serves as a tool for achieving better project outcomes. (CLEAVER 2004: 37; HICKEY & KOTHARI 2009: 82; VERNOOY 2005: 33; PASTAKIA et al. 2002: 2)

Determining participation according to purpose, stage, sphere or whether it is process or product approaches participation from conceptual perspective. It is another question how participation can be transmitted into practice. This aspect is of special relevance regarding the above mentioned objectives of empowerment and ownership which are closely related to the sort of involvement in participatory processes. Likewise the above listed conceptual determinants of participation, active involvement can vary significantly in participatory practice.

Figure 7 illustrates the types and ranges of participation regarding degrees of involvement, control and benefit of beneficiaries. The lowest degree of beneficiaries' active involvement, empowerment, and ownership can be characterized by 'compliance' (tasks are assigned to target groups; agenda and the project process are directed by outsiders). As opposed to this, the highest level of involvement of beneficiaries, and thus the highest potential for empowerment, ownership and active engagement can be achieved through 'collective action' (local people set their own agenda and mobilize to carry it out in the absence of outsiders). Between the two poles, three intermediate forms of participation can be distinguished: 'consultation' (local opinions are sought, outsiders analyze and decide the course of action), 'cooperation' (local people work with outsiders to determine priorities; the responsibility to direct the process lies with outsiders), and 'co-learning' (local people and outsiders share knowledge, create new understanding and work together to form action plans). (KANJI & GREENWOOD 2001: 5)

Other participation approaches propose to distinguish continuums of participation in order to avoid fixed value judgments which are inherent to hierarchical ladders. A classification of continuums acknowledges the validity of different forms of participation during stages of a research process or in different situations and contexts. (cf. KINDON et al. 2009: 16) For a better illustration, participation continuums are also visualized as stages of participation degrees albeit they have to be imagined with fluent passages.

Figure 7: Participation levels and continuums



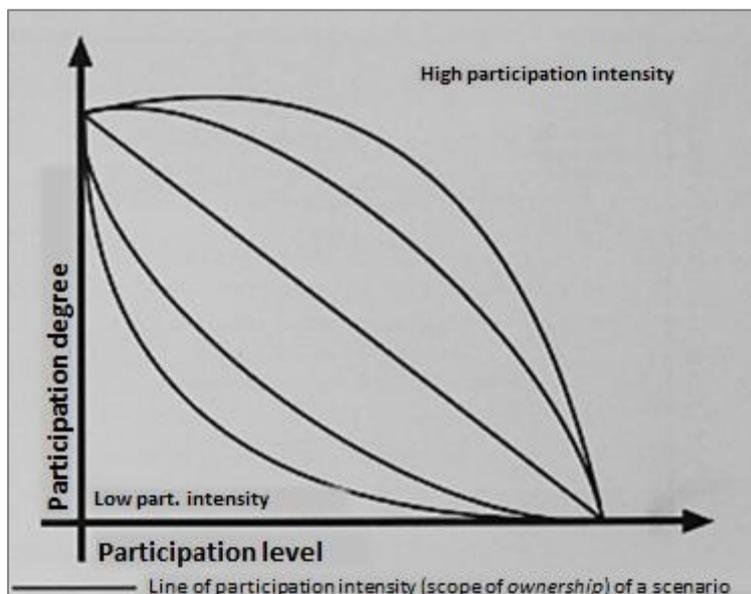
Source: ZAHUMENSKY 2013, adapted from KANJI & GREENWOOD 2001: 5, PRETTY et al. 1995 as cited in KINDON et al. 2009: 16

The participation levels or continuums convey an idea about the merest nuances of quality of participation that signify substantial differences in participatory practice. SEGEBART offers an evaluation of the principles of operation and associated outcomes of participation in the context of *good local governance* (SEGEBART 2007). Besides a useful comparison of optimal and suboptimal participation, SEGEBART gives deeper insights in the conceptualization of participation intensity in order to determine more precisely the quality of participation. In a first instance, she summarizes participatory approaches in participatory monitoring among others according to goal setting, participation degree, decision-making level, institutional sustainability, potential for empowerment, and contribution to *Capacity Development*. In the ideal case of '*deep participation*' empowerment, ownership and capacity development are strived. The above criteria are rated as high and of long-term nature in contrast to the worst case of '*pseudo participation*' where the criteria are estimated as low and with a short duration. (SEGEBART 2007: 74, own translation) According to SEGEBART, participation intensity is composed of participation degree⁷², participation level⁷³, and *ownership*. The participation

⁷² The participation degree includes quantitative parameters such as the number of actors, the degree of representativity of the population amongst the participating actors, the degree of concernment of the involved actors through intended activities, and the affirmative action of marginalized groups, as well as qualitative parameters such as frequency of participation, duration of participation, participation inhibiting and facilitating external factors, and the configuration of participation. (SEGEBART 2007: 78, own translation)

intensity results from the interplay of participation degree and level which mutually influence each other, as well as it results from specific assets and capabilities. Those factors result in a certain degree of *ownership* that can be increased through adjustment processes between participation degree and level. The increase of degree and level can lead to a total increase of participation intensity. Unlike assets, capabilities and ownership, participation degree and level can be directly influenced through external controlling. (SEGEBART 2007: 77ff.) Based on these coherences SEGEBART developed an ideal-typical model of participation intensity that shows scopes of *ownership* that characteristic for an average development during the participatory process (see figure 8). Moreover, the model illustrates characteristic manifestations of lines of participation intensity according to groups with higher intellectual levels above the average line and lower intellectual levels below the average line:

Figure 8: Line of participation intensity (scopes of *ownership*) in 5 scenarios



Source: SEGEBART 2007: 79, own translation

The very interesting insight of SEGEBART's depiction is that participation intensity can indirectly be influenced through outside activities.

In sum, the different approaches to participation have in common important general principles which are listed in the following table. The overall overlap of all approaches is the aspiration for an alternative and successful strategy of sustainable development and improvement of livelihoods through the inclusion of target groups (individuals, communities, entire populations). Some approaches emphasize on efficiency

⁷³ In the participation level contents and forms of the participatory process are important such as the political and the professional level of participation and decision-making. Parameters are the subjects and forms of discussion, as well as the forms of decision-making procedure. (SEGEBART 2007: 78, own translation)

and effectiveness of activities, others lay their focus on mutual learning processes or social transformation as central outcomes of participation. But implicitly participation is always linked to power relations and to the transmission of control to target groups. (NEEF & NEUBERT 2004: 1; MOHAN 2008: 46)

Table 1: Common principles underlying participatory approaches

Principle	Explanation
1. Defined methodology and systemic learning process	Focus lies on cumulative learning by all participants; the use of methods has to be participative.
2. Multiple perspectives	To seek diversity rather than to characterize complexity; all views of activity or purpose are fraught with bias and prejudice, and this implies that there are multiple possible descriptions of any real-world activity.
3. Group learning process	Recognition that the complexity of the world will only be revealed through group learning. This implies three possible mixes of investigators: those from different disciplines, from different sectors, and from outsiders (professionals) and insiders (local people).
4. Context specific	The approaches are flexible enough to be adapted to suit each new set of conditions and actors.
5. Facilitating experts and stakeholders	The role of the 'expert' is best thought of as helping people in their situation to carry out their own study and so to achieve something. These facilitating experts may be stakeholders themselves.
6. Leading to sustained action	The learning process leads to a debate about change, and it changes the readiness to contemplate action. The debate defines changes which would bring about improvement and seeks to motivate people to implement the defined changes. Action is agreed, and implementable changes will therefore represent an accommodation between the different conflicting views. This action includes local institution building or strengthening, so increasing the capacity of people to initiate action on their own.

Source: ZAHUMENSKY 2013, adapted from KANJI & GREENWOOD 2001: 49f

The above listed principles suggest some major objectives of participatory approaches: mutual learning processes, a facilitating attitude of practitioners, and the initiation of social change through active engagement. The overall objectives of participatory approaches, as well as ways for their achievement are illustrated more detailed in the following.

3.3 Major objectives of participation and their achievement

Initiating transformation or social change is a central objective of many participatory approaches and it refers to two dimensions: on the one hand to the transformation of existing development practices, and on the other hand, to the transformation of social (power) relations, institutional practices and capacity gaps which cause social exclusion. With respect to transformation one rule of thumb should be taken into account: if social transformation is the objective of the participatory activity, as much control as possible should be transferred to local people (VERNOOY 2005: 34). Yet, this should not be understood in a quantitative way along the lines of 'the more participation the better'. Rather the specific potentials as well as shortcomings or limitations of participatory approaches in certain contexts or scientific situations should be analyzed, that is focusing on a qualitative analysis of participation. In practice, it might often be unrealistic to expect participatory projects on local level to transform existing power relations since transformation is reliant on broader political change. Besides, transformation does not necessarily involve a change in patterns of power relations but at least a strengthening of bargaining power of local people *within* these relations. (HICKEY & MOHAN 2004: 13ff.) However, in any case transformations "need to reach beyond local scale, involving multi-scaled strategies that are operationalized at all levels - individual, structural and institutional." (HICKEY & MOHAN 2004: 15).

Another objective of participation is building critical consciousness mainly about undesired local situations and unequal power relations among all people involved in the participation process. Participatory approaches especially seek for the involvement of potentially marginalized or disadvantaged individuals or communities (often the rural poor) to "influence the policies and practices that affect them" (HICKEY & KOTHARI 2009: 82) and "over which they previously had limited control or influence" (COOKE & KOTHARI 2004: 5, MOSSE 2004: 16). Gathering more knowledge about interrelations of various causes of local problems, increasing critical reflection about the status quo and the individually desired future status, discovering ways to articulate the own needs, internalizing that one has the individual right to be heard, are elements of a critical consciousness that can release undreamed-of forces to the benefit of active engagement for the exercise of transforming influence. The processes of a critical consciousness building are closely linked with the objective of empowering especially the marginalized or disadvantaged. Participation can empower people in creating of a sense of ownership and the related perceptions of social responsibility to do practices that are required in communal life. Both empowerment and critical consciousness can be achieved by means of specific participatory methods (PMs)⁷⁴

⁷⁴ Participatory tools are not exclusively but commonly applied in agricultural science and in rural development practice by both governmental organizations and non-governmental organizations (NGOs). They are mostly associated with the project-based methodology of *Rapid Rural Appraisal* (RRA), *Participatory Rural Appraisal* (PRA) or *Participatory Learning and Action* (PLA) and they focus on visualization methods in order to ensure the involvement of less literate or even illiterate target groups. (cf. CHAMBERS 2008: 87ff.)

which in the first instance facilitate critical consciousness about structures of disempowerment or local problems. *Participatory Rural Appraisal* (PRA) is one the most renowned participatory methodologies that regards group dynamics and claims for sensitivity during the application of participatory tools in order to open spaces for difficult and subtle processes such as critical awareness-raising, empowerment, transformation of power relations and inducement of social change. There are five ways of empowering people through participatory methods (PMs):

Table 2: Ways of empowerment

Ways of empowerment	Explanation
1. Democracy on the ground	PMs take place on the ground with the intention that domination can take place less easily than in upright face-to-face interaction.
2. Representation of complex realities and relationships	Tangible and didactical reduced methods facilitate expression and analysis of complex relationships and causalities for local people; this can strengthen their self-esteem and their willingness to participate.
3. Visuals as instruments of empowerment	Visualization methods enable local communities to express and display their knowledge since they are tangible methods.
4. Participatory numbers	There can be also derived statistics from PMs which in some cases turned out to be even more accurate and utile than official statistics.
5. Group-visual synergy	Group-visual synergy represents the interplay of the preceding ways of empowerment, behavior, attitudes and group dynamics.

Source: ZAHUMENSKY 2013, adapted from CHAMBERS 2011: 306ff.

Group-visual synergy illustrates how the different components of participatory processes, mainly group processes and visualization of statements, discussions, results and questions, are multifariously interrelated in order to allow for empowerment and self-initiative. Group motivation, discussing and adding details to the discussion, cumulative representation, visuals, and cross-checking of statements or findings affect and determine each other. Thus a positive sum synergy is created amongst group members that motivates, inspires and enables all people involved to contribute and to learn. Facilitators (usually professionals from outside) have the role to observe, assess, and analyze the process while oscillating between initiating and facilitating in the foreground or observing and assessing in the background. In doing so, they facilitate the transformation of unequal relations of domination and subordination between outsiders (researchers/ development practitioners) and insiders (local people) as well as between insiders through facilitating and enabling local people to express and enhance their own contextual and specific knowledge. (CHAMBERS

2011: 306) Finally, through discussion, exchange and empowerment, target groups are enabled to increase their awareness of structural reasons for their exclusion or their problems and how they can deal with this. (HICKEY & KOTHARI 2009: 86) Target groups can develop a more critical consciousness about their situation, and thus, they can increase their motivation to contribute actively to problem-solving activities. Participatory tools are especially designed to facilitate the critical reflection process and increasing critical awareness of target groups since they are assumed to be flexible, continuously evolving in the light of problems of application, and adapting to specific contexts. (cf. COOKE & KOTHARI 2004: 6)

A third objective that related to the encouragement of local individuals' proactive participation is that policies, project activities and research practices are supposed to be more effective, efficient and sustainable. This results from the assumption that the inclusion of locals increases the context- and target-group-specifics of activities. (WILLIS & KUMAR 2009: 114; HICKEY & KOTHARI 2009: 82). Moreover, the involvement of local people in development activities allows for a cost-efficient design and implementation of projects because beneficiaries can contribute by providing ideas, manpower, labor, and resources through their active contribution to the determination of objectives and actions; through assistance in administration, monitoring and evaluation of projects; through the contribution of their knowledge about viable solutions for local environmental; as well as through their specific local *indigenous knowledge*⁷⁵ of social and institutional constraints.

Besides, participation can also lead to more sustainable development since direct democratic processes of decision-making and self-help facilitate to better solve lots of key problems in the long term. Thus, especially through beneficial group processes more and better impacts as well as long-term viability of empowerment and ownership can be obtained (VAN HECK 2003: 11). VAN HECK stresses the importance of freely formed groups to facilitate the sustainability of empowerment and ownership. According to VAN HECK, group formation initiates a circle of action that helps "to create new or strengthen existing self-formed and self-run groups and organizations through which the rural poor gain access to resources, inputs and services and through which they participate actively in the project, also by means of self-proposed actions" (Ibid. 2003: 6). Participation and associated processes of empowerment and self-initiative increase not only peoples' awareness, confidence and control over resources and development activities but also their participation at levels beyond their community (Ibid. 2003: 11).

⁷⁵ Participatory approaches rethink knowledge generation and aim on reversing biased forms of knowledge generation in development (MOHAN 2008: 47). Earlier, the focus lay on development experts and their often scientific knowledge. The increased valorization of *indigenous knowledge* is expected to deliver information that is supposed to be "closer to the 'truth' than other less participative, top-down methods of enquiry and knowledge accumulation" (HICKEY & KOTHARI 2009: 86) since it helps to understand development problems in the way local people perceive them. Moreover, the acknowledgement of local *indigenous knowledge* avoids poor practice and exploitation of the people involved through continuous dialog on validity, quality and ethics of the applied methods. (COOKE & KOTHARI 2004: 5)

3.4 Constraints of participation and participatory methods (PMs)

The majority of participation concepts pursue ambitious claims. For this reason, participation mainstreaming was accompanied with criticism from both inside⁷⁶ the participatory adherents and from outside⁷⁷. Criticism to participation concepts can be divided into critiques on fundamental problems in the participation discourse (discussing conceptual, theoretical and political problems of participation concepts) while other critiques claim a methodological revision (discussing objectives, applicability and appropriateness of PMs). (MOSSE 1994; IIED 1995; HICKEY & KOTHARI 2009: 87; COOKE & KOTHARI 2004: 5) Selected constraints are illustrated in the following.

A lot of participation problems are closely linked with the previously addressed group dynamics. One corner stone of participation in practice, i.e. the application of participatory methods is the precondition of *positive* group functions. Hence, PMs fear group dysfunctions that often can neither being figured out nor being avoided. COOKE explains such contraindicated group dynamics. Based on socio-psychological concepts he points out various risks of participation to negatively influence individual's thoughts, feelings and behaviors which are especially caused by the presence of others and associated face-to-face interactions. These group dysfunctions are the so-called *risky shift*, the *Abilene Paradox*, *groupthink*, and *coercive persuasion*. According to COOKE, in group discussions people are "more risky to take collective decisions than those they would have taken individually" (= *risky shift*) (COOKE 2004: 106ff.). Additionally, people may take decisions "that participants have second-guessed is what everyone else wants [...] leading into misperceiving the collective reality" about actual desires (= *Abilene Paradox*) (ibid. 2004: 108ff.). According COOKE & KOTHARI there are also cases in participatory practice where "what [...] was expressed as a 'local need' was actually shaped by local perceptions of what the agency in question could legitimately and realistically be expected to deliver" (COOKE & KOTHARI 2004: 8). Moreover, *groupthink* and group pressure can lead to wrong decisions which can be harmful to group outsiders (ibid. 2004: 112ff.). Finally, the "manipulation of group processes can lead to malign changes in ideological beliefs or consciousness" (= *coercive persuasion*) (ibid. 2004: 106ff.). COOKE & KOTHARI have scruple of group dynamics which may lead to decisions (though taken participatory) since they may "reinforce the interests of the already powerful" (ibis. 2004: 8).

Another limitation emerges if one changes the perspective from practitioners to target groups. At this, participation can also experience difficulties due to the refusal of

⁷⁶ "Self-critical epistemological awareness [that] is considered an essential component of participatory ideology and practice." (CHAMBERS 1997: 32) The critique from inside is considered as inherent to participatory approaches for the purpose of continuous improvement. Thus it is not seen as criticism *per se*. (cf. COOKE & KOTHARI 2004: 5)

⁷⁷ CHAMBERS accentuates that many of the academic critics of PRA "were not always able to draw on personal experience, or sometimes drew on their own defective practice." (CHAMBERS 2008: 91)

participation by target groups especially because of the susceptibility to external manipulation: "Yet, intended participants can, and do, resist participation in a number of ways. These include simply refusing to participate, rejecting projections about their lives, retaining information, and presenting themselves in a variety of diversionary and conflictual ways." (HICKEY & KOTHARI 2009: 88) Additionally, the demotivation to participate is dependent on political frame conditions and power structures of the country or project area which can be disempowering and thus demotivating. Degrees of centralization vs. decentralization, free enterprise systems vs. planned or controlled systems, as well as the degree of political stability are important determinants which shape situations where governments either support participation or adopt an even dismissive attitude towards participation. This is especially relevant for participation in rural areas since particularly rural elites use to influence political structures to such an extent that participation is at least restricted: "A serious obstacle is the widespread mentality of dependence, sense of frustration as well as distrust in officials among low income rural people. The latter are frequently dominated by local elites to whom they have to leave key decision-making." (VAN HECK 2003: 12). Furthermore, there are serious physical and other structural impediments that influence motivation for participation such as heavy workloads, low levels of living, weak health conditions, low levels of education, ignorance of rights to self-organize groups, lack of know-how and lack of leaders which discriminate particularly women's participation. (Ibid. 2003: 12)

Moreover, although transformatory participation in the sense of self-sustaining empowerment and emancipation where local people decide and prioritize development activities or proposals with a minimum of external support is predominantly intended it is rarely a viable practice. First of all, development activities are mostly bound into development projects and thus the activities are time-bound and accountable to funders. Hence, for time reasons desired outcomes are often to a certain degree predetermined by funders or simply not achievable within a narrow time frame. (cf. MOHAN 2008: 48) Secondly, the costs of participation are often underestimated. Besides the costs of projects the opportunity costs for already time-consuming direct democratic participation of local people are often disregarded. (NEEF 2003: 498). Thirdly, even where participatory activities turn out to be successful on community level their transformation on a broader level appears difficult. Scaling-up social change from below is difficult within national or even global consolidated structural frame conditions and established power relations: "[o]bviously, a well-planned PRA is of no use to the poor if bad governance and a distorted legal and political system limit the scope for action of rural people and prevent farmers from getting access to natural resources." (NEEF 2003: 499). As a consequence, participation often results in tokenism, i.e. a rhetoric use of participation with limited empowerment effects. (cf. MOHAN 2008: 48). HILDYARD et al. also point out the structural anchorage of participation problems since they characterize local people as becoming "a ghostly presence within the

planning process – visible, heard even, but ultimately only there because their involvement lends credibility and legitimacy to decisions that have already been made." (HILDYARD et al. 2004: 59). "Grassroots organizations thus become the human 'software' through which investments can be made with the least local opposition." (HILDYARD et al. 2004: 60).

In addition, there can also be revealed serious constraints of participatory methods (PMs) such as operational limitations, possible cultural inappropriateness, and imposition of external control (HAILEY 2004: 93ff.). The development of PMs is based on the insight that "local people with little education [are] much more capable of doing their own appraisal and analysis than professionals believe[d]" or than even had been supposed by themselves (CHAMBERS 2008: 87f)⁷⁸. PMs' contextual and target-specific flexibility comes along with a methodological pluralism and an advantageous flexibility for creative advancement of the tools. This methodological diversity and vagueness can overcharge practitioners who seek for generalizing manuals or guidance of methods. Those in turn are partially questionable since there is no standard instruction sheet for PMs as there are no standard situations in complex realities that are to be analyzed. The methodological openness intends to open spaces for ownership and responsibility and personal reflection which oblige insiders, i.e. local people, but it can indeed facilitate bad practice since practitioners can feel lost without exact instructions or they can unconsciously misapply PMs. (cf. CHAMBERS 2011: 309f) Moreover, the strong emphasis on participatory instruments increases the risk of 'instrumentalizing' participatory approaches. CLEAVER terms the meanwhile strong orientation on 'getting the techniques right' during the application of participatory tools and the misconception that this was the principle way of ensuring the success of participation activities a 'tyranny of techniques' (CLEAVER 2004: 38). Through a narrowed technical view on participation issues of power and control over information and other resources are likely to be disregarded. Hence, real understanding, critical reflection on methods as tools for social change cannot take place in such an inadequate framework. (Ibid. 2004: 36ff.) Finally, participatory techniques are accused to reduce the complexity of reality and processes of social life so that they are manageable for the planner. Didactical reduction thus represents both advantage and disadvantage: delivering a simplified basis of reality to encourage participants to analyze problems is shaded by shaping the reality according to the practicability of analyzing tools (HICKEY & KOTHARI 2009: 88).

⁷⁸ Many sorts of techniques are made by local people, on the ground or on paper, using local material that is available for visualization. They are primarily applied in small groups where men, women and children use earth, sand, stones, seeds, twigs, chalk, charcoal, paper, pens, and other materials, and objects as symbols to represent issues. (THEIS & GRADY 1991; CHAMBERS 2008: 86ff.; CHAMBERS 2011: 298) Therefore, PMs are principally visual, tangible, and range from trend and change diagrams, casual linkage diagrams, mental and social maps, transects, time lines, ranking or scoring matrices for complex and detailed comparison, observations, and focus group discussions to role play, apart from combinations of these tools or invention of new methods. Usually, PMs are foreseen to be embedded in a long-term process and aim at the continuous involvement of project staff with local community members. (PROBST as cited in NEEF 2003: 496; HICKEY & KOTHARI 2009: 86; CHAMBERS 2008: 87)

In case there is little reflection about possible biases (Eurocentrism, 'top-downism') and about the own perception of the purpose(s) of participatory processes the risk of misuse of participatory tools for own interests of f.i. local elites or of funding organizations is high. For instance the premise that target groups are homogenous⁷⁹ runs the risk of concealing power relations within communities as participatory practice "may represent co-option of the process in the interest of existing elites" (HICKEY & KOTHARI 2009: 87). Group dynamics and non-representative selection of participants in participatory activities (e.g. exclusion of women) can contribute to decisions that reinforce interests of existing elites or lead to prioritization of topics in their interests. Additionally, collective working under public audience can delimitate the participation of marginalized people who may not be used to express themselves in front of other participants⁸⁰. In contrast, many of the already powerful are supposed not to be anxious in this regard. (HICKEY & KOTHARI 2009: 87f) Hence, participation was already titled as 'tyranny'⁸¹ in terms of "both a real and a potential consequence of participatory development, counter-intuitive and contrary to its rhetoric of empowerment though this may be." (COOKE & KOTHARI 2004: 3). COOKE and KOTHARI accentuate "[T]hat participatory development's tyrannical potential is systematic, and not merely a matter of how the practitioner operates or the specificities of techniques and tools employed." (COOKE & KOTHARI 2004: 4)

All these obstacles of participation indicate that environmental, economic and social contexts must be taken into account if beneficiary participation is strived. From methodological viewpoint one of the major challenges of participation is how to translate participatory theory into participatory practice. The intermediation between participatory theory and practice is the subject of participatory research. On this account, a brief outline about the translation of the participation paradigms in science, i.e. about *Participatory (Action) Research* (P(A)R) will be given in the following.

⁷⁹ Commonly, 'communities' are defined as static, harmonious and homogenous groups which share common needs and interests. (cf. GUIJT & SHAH 1998) However, in practice the homogenization of groups according to age, ethnicity, religion, gender, class or caste is also difficult to avoid.

⁸⁰ There is often naivety about the practicability of the intention of e.g. PRA to create an atmosphere of informality and relaxed interaction. To the contrary, a PRA exercise, the establishment of a *Participatory Monitoring & Evaluation* (PM&E) scheme or even an open community meeting is usually a highly formal and public event for a local community (NEEF 2003: 496).

⁸¹ The 'tyranny' of participation is understood as an "illegitimate and/ or unjust exercise of power [...] [and] participatory development facilitates this." (COOKE & KOTHARI 2004: 3).

3.5 Participatory (Action) Research (P(A)R)⁸²

Participatory (Action) Research P(A)R accompanies any participatory project since it is necessary for data collection and analysis about action areas, as well as for the project expansion and replication (HECK 2003: 46). Again, a variety of approaches was summarized under this research concept⁸³ and P(A)R mainstreaming has diverse sources of inspiration⁸⁴. Yet, it evolved mainly in the background of the human relations movement from the 1930s on and in the context of critiques of methodological inadequacy in positivist science during the 1960s. P(A)R represents an alternative qualitative research method in social or environmental science, or a specific version of field study⁸⁵ that contrasts with the 'traditional'⁸⁶ analytic-nomological research paradigm in scientific theory which is rather based on quantification, standardization and measurability. (cf. KROMREY 2006: 538ff.; BOHNSACK et al. 2006: 14f; KINDON et al. 2009: 9) P(A)R differs fundamentally from conventional research in terms of purposes, relationships, ways of conceiving knowledge and its relation to practice: "[Action research] seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities." (REASON & BRADBURY 2011: 4).

Meanwhile, the typical P(A)R process is dynamic and should be imagined as a spiral of an advanced or improved action for social change. Usually this spiral process is divided into phases of observation, process planning, action, reflection/ monitoring⁸⁷, learning through observation of impacts of the preceding action, and the planning of a new advanced or improved action. (PIERCE COLFER et al. 2005: 245) The process of the interplay between action and reflection designates an iterative cycle or a 'spiral science' (cf. KINDON et al. 2009: 10). Summarized, P(A)R describes a research process, where theory is developed and tested by action⁸⁸; where project means and desired ends are consistent; and where means and ends are determined by local communities with the least possible external support. (KROMREY

⁸² There is no distinct boundary between *Participatory Research* (PR) and *Action Research* (AR): "As we search for practical knowledge and liberating ways of knowing [...] action research is participative research, and all participative research must be action research." (REASON & BRADBURY 2011: 4). In the following, the author of this paper subsumes PR and AR under the abbreviation P(A)R.

⁸³ "Action research is a family of practices of living inquiry that aims, in a great variety of ways, to link practice and ideas in the service of human flourishing." (REASON & BRADBURY 2011: 1) KINDON et al. use the term 'schools' to describe the range of researchers engaging with various forms of P(A)R. (KINDON et al. 2009: 10)

⁸⁴ It is often traced back to social experiments of KURT LEWIN (LEWIN 1953, 1963) or community-based transformative research processes of PAULO FREIRE (FREIRE 1970) who coined the process of *conscientization* (= awareness rising) for political action.

⁸⁵ WAGNER addresses the need for verification of some action research approaches whether they can be regarded as separate scientific research methods. (WAGNER 1997: 20)

⁸⁶ 'Traditional' or 'conventional' research is accused not to act in collaboratively and nonhierarchical way. (PAIN 2004: 652)

⁸⁷ The monitoring authority ideally has to be developed during the process (SEGEBART 2007: 111).

⁸⁸ Thus, P(A)R can be characterized as 'active interaction' (KROMREY 2006:543, own translation) or 'intervening practice' (BOHNSACK et al. 2006: 14, own translation).

2006: 543; LAMNEK 2005: 713; BOHNSACK et al. 2006: 14; PASTAKIA et al. 2002: 2ff; MCKINNON 2007: 773f; KINDON et al. 2009: 9ff.)

3.5.1 P(A)R's new epistemology and research paradigms

The starting point for P(A)R was the scientific recognition of the necessity to develop new procedures which are more adequate for capturing social problems. Besides providing new (semi)-qualitative methodologies, P(A)R aims on finding solutions for social change to inform action through collaborative processes between researchers and respondents. With this, P(A)R follows the epistemological principle that it is not enough to understand the world, but that one has to change it for the better (KINDON et al. 2009: 13). In doing so, P(A)R is not necessarily impartial since it claims "to contribute to practical social changes in behalf of socially disadvantaged groups" (KRAMER et al. 1979: 22, own translation)

The above mentioned demanded collaborative process between researcher and respondent in P(A)R requires a coequal status of both during the research process. P(A)R exceeds conventional qualitative empirical social research insofar as it quits the separation of researching subject and researched object in order to achieve that respondents and researchers share ownership of the research activity (PAIN 2004: 652). Therefore, both researcher and respondent are intended to be actively involved in all stages of the research activity, from problem definition to dissemination and action. Those who otherwise might be objects of research graduate to co-researchers with the power of final decision-making with respect to the research design, selection and design of research instruments, interviewing, data analysis, reporting, evaluation, and the discussion of results. (VAN HECK 2003: 46; REASON & BRADBURY 2011: 1)

The coequality and negotiation of decisions between researcher and respondent is a major challenge of P(A)R since differing knowledge systems (scientific vs. traditional) may come into conflict. Therefore, an ambience of acknowledgement of a plurality of knowledges and a variety of interpretations is another main paradigm of P(A)R. Methodologically, P(A)R envisages overcoming the possible gap between opposing knowledge systems through sustained dialog between researcher and respondent. Hence, P(A)R follows the concept of 'communicative validation'. Through such dialog academic knowledge works in a 'dialectical tension' with popular insider knowledge. This is meant to produce a more complete understanding of a situation or environment. The credibility and validity of the derived knowledge during the P(A)R-process is measured according to whether the resulting actions solve problems of the involved people and whether they increase their self-determination. (KINDON et al. 2009: 14; PASTAKIA et al. 2002: 6; BOHNSACK et al. 2006: 15; BREITBART 2010: 144; MOSER 1975: 9)

3.5.2 Benefits of P(A)R

P(A)R approaches display conceptual and operational benefits leading to a more equal distribution of power during research processes. P(A)R does not reject conventional scientific methodologies but it is rather considered as complementary procedure and corrective critique about conventional methodologies which often impose agendas, extract data and are of no benefits for the investigated communities. (BOHNSACK et al. 2006: 15; MAYRING 2002: 19; LAMNEK 2005: 5, KESBY et al. 2009: 20)

A first direct benefit of P(A)R is the generation of social change through science. By raising the question who benefits from research outcomes, P(A)R promotes the rethinking of a new epistemology of social change in research with the objective "to foster a community's capacity to problem solve and design actions without having to rely solely on outside experts" (BREITBART 2010: 144). The equalization of different knowledge systems and involved people in the research process is a precondition for the collaborative development of activities that can lead to social change. This coequal integration of respondents as research 'subjects' democratizes the research process.

Methodologically, P(A)R instruments encompass visualization, dialog, storytelling, collective action, group work and discussion, mapping, rankings and scoring, shared analysis, participant observation, interviewing, exchange programs, and learning by doing (KINDON et al. 2009: 17). Those methods have certain group-specific benefits of empowerment as well as they can facilitate the capacity building of participants. Moreover, through capacity building and empowerment P(A)R and associated tools facilitate political engagement that goes beyond the spaces of its immediate intervention. Thus it allows for long-term participation and contributes to the sustainability of participation. (cf. KESBY et al. 2009: 19) Another positive modality of power in P(A)R is the negotiation between different positions of participants in pursuit of a common goal, through persuasion by strength of argument and through authority among participants in the sense of powers of self-assertion to researchers who acknowledge their own uncertainty and situatedness (KESBY et al. 2009: 22).

3.5.3 Constraints of P(A)R

From methodological side, participatory tools have been criticized for their poor validation of obtained information in case validation may not be done with the adequate scientific rigor. Objectivity in participatory methodologies is limited and analysis as well as documentation of the predominantly qualitative methods is often insufficient. The combination of innovativeness, simplicity and flexibility of participatory tools with the demand for scientific rigor which is accompanied with a high standardization degree of methods is one of participation's dilemmas that impede the systematic validation of results. (cf. NEEF 2003: 495)

Other constraints refer to possible negative power effects of P(A)R which are even more subtle but similar to those of participation in general. First of all, a limitation of P(A)R is the variety of interpretation of its underlying paradigms by researchers. Once P(A)R is understood as a convenient method of extracting local knowledge it can be as extractive as conventional research. (PASTAKIA et al. 2002: 2) Moreover, although P(A)R seeks not to control behavior it can involve hidden 'governing effects' since desired paradigms of P(A)R can also be considered as externally imposed: "Researchers deploy discursive resources such as 'equality', and micro-technologies such as facilitation, to induce participants to reconstitute themselves as reflective agents engaged in a programme of critical self-regulation and analysis. These governing effects of participation are certainly *power-full* - involving or constituting power - but they can be positive as well as negative." (KESBY et al. 2009: 20, original emphasis) A negative potential of P(A)R is its heavy susceptibility to new forms of subjection, coercion, and authority. For instance, researcher may re-authorize themselves as new experts of participation and thus, do not contribute to social structural change. (cf. PAIN et al. 2009: 27) Furthermore, "indirect *coercion* may occur where participation in an intervention offers the only possible hope against the threat of poverty" (KESBY et al. 2009: 21, original emphasis). More subtle negative power effects are inducement or seduction where "access to resources and skills is promised and aspirations tapped to ensure recruitment". Authority, finally can occur where participants concede an expert status to researchers. This may occur with or without researchers' intention or realization and therefore, these modalities of negative power can hardly be influenced. (KESBY et al. 2009: 21) From this viewpoint, participation can be a pitfall and it may turn into the opposite of what is theoretically intended.

3.6 Participatory Agricultural Research (PaR)

Participatory Agricultural Research (PaR) is the application of *Participatory (Action) Research* (P(A)R) in agricultural research. Hence, PaR is a strategic, applied or adaptive research where practicality is of higher importance than theory and scientific knowledge (NEUBERT 2000: 27). Contemporary PaR approaches developed in the background of sustainable agriculture⁸⁹ paradigm as a response to the lack of benefits of small-scale

⁸⁹ In 1987 the WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT (WCED) called attention on problems of present and future food security and claimed the need for a new approach to agricultural development which regards not only issues of raising global food production but also the reduction of distortions in the structure of the world food market as well as focusing on food production for food-deficit regions. According to WCED a sustainable agricultural approach ideally encompasses agricultural systems that focus to equal shares on people and technology, on resources and production, on the long term and the short term. (WCED 1987 as cited in REIJNTJES et al. 1994: xvii) In practice, sustainable agriculture needs to be ecologically sound (maintaining the quality of natural resources and the vitality of agroecosystems), economically viable (production for self-sufficiency and/ or income, and sufficient returns to ensure cost coverage of farmers), socially just (equal and just distribution of resources and power), humane (respecting all forms of life) and adaptable (enabling rural communities to adjust to constantly changing farming conditions). (REIJNTJES et al. 1994: 2f)

farmers from conventional on the top-down *transfer-of-technology* model oriented agricultural research. Such approaches have been very common in the 1950s and 1960s during the so-called *green revolution* where researchers delivered standard agricultural technologies that have been generated on research stations. Yet, those approaches turned out to deliver technology packages which have not been adopted by farmers. In the 1970s and 1980s much was puzzled over causes of the non-adoption of technologies, from backwardness and ignorance of farmers to constraints at farm level in order to explain why conventional on-station research approaches have not been successful in the implementation of sustainable land-use systems⁹⁰. In the 1990s it was recognized that inappropriate technologies that depend heavily on external inputs is the main cause of non-adoption.

PaR especially criticizes conventional non-participatory on-station research approaches because they ignored marginal regions and resource-poor farmers during the research process (NEUBERT 2000: 25). Scientists often had and still have difficulties in understanding farmers' needs and their behavior, and how farmers conduct experiments for technology improvement. Frequently, there is a 'clash between worldviews' since scientific knowledge bases on factual aspects while indigenous knowledge has strong spiritual foundations, worldviews and values (WOODLEY 2005: 66). The need for collaborative cooperation between agricultural researchers and farmers in order to deliver adequate agricultural technologies becomes very clear in PaR. Likewise, the associated problematic of contrasting knowledge systems is clearly recognizable. Based on these insights, focus was laid on small-scale resource-poor farmers' participation in agricultural research processes in order to deliver innovation development and adaptation under real life conditions with the objective to develop technical solutions that are practically relevant, useful and adapted to the specific local needs of farmers. However, major problems of PaR such as the scaling-up of impacts, the transfer of knowledge between different sites, as well as means for the generalization of results remained. (SELENER 2005: 6; NEUBERT 2000: 25ff.) Additionally, mainstream participatory approaches in agricultural research often concentrated on outcomes on product level, i.e. the development of innovative agricultural technologies as an outcome⁹¹ instead of outcomes on process-level, i.e. focusing on social change, empowerment, local self-organization and capacity building (cf. VEL et al. 1996: 151).

⁹⁰ The *green revolution* was successful under conditions where farmers could effort capital for irrigation and fertilizers. The production conditions of resource-poor farmers in marginal regions could not be improved via input of capital since resource-poor farmers usually lack capital for fertilizers and irrigation. Furthermore, smallholders farming systems in ecologically fragile regions are highly complex systems of survival strategies which are embedded in local social environment. Hence, the standardized *top-down-transfer-of-technologies* was moribund. (NEUBERT 2000: 33)

⁹¹ According to NEUBERT, *Participatory Technology Development* (PTD) is an example for product-oriented PaR since in PTD the participatory research process simply serves as methodological means for the desired result: new technologies. (NEUBERT 2000: 28)

3.6.1 Farming Systems Research (FSR)

Farming Systems Research (FSR) is a form of PaR. In the context of difficulties in transfer of technologies FSR and its subdivisions recognized the strong linkages between farming activities and the environment, the household and community. Therefore, agricultural research, extension and associated support service institutions are linked in FSR with the objective to focus attention on improving small-scale farmers' production systems on household level⁹² and, in a broader sense, to reduce rural poverty. Consequently, FSR has three actors: the researchers, extension agents and farmers, and it can be described as an interactive stepwise process (AVILA 1987: 239ff.).

Methodologically, FSR usually identifies, tests, delivers and disseminates the most promising agricultural technology to increase productivity (BEHERA & SHARMA 2008: 24). The participatory moment in FSR is that the generation of appropriate technologies takes place under involvement of the technology users in the planning/ design, testing/ evaluation and even in the dissemination process of new technologies. However, there is a variety of procedures and methodologies in FSR. At first, FSR varies in the location of trial fields. Besides farmer relevant but non-participatory on-station research (huge separate research trials) that serves as a platform for the extraction of formal scientific knowledge there can be conducted (supplementary) experimentation about technologies⁹³ under inclusion of farmers' knowledge into the research process. The latter takes place on-farm, i.e. on small research trials on farmers' parcels. Secondly, different types of FSR can be distinguished according to the level of control and management exercised by farmers and researchers. Control ranges from 'researcher managed' to 'farmer managed', whereby the purpose is to transfer research from researcher design and control to farmer design and control (CHAMBERS 2011: 302).

3.6.2 Delimitation of *On-farm Research* (OFR), *Farmer Participatory Research* (FPR) and *Participatory Technology Development* (PTD)

Based on the above mentioned distinctive features FSR can be subdivided into *Farmer Participatory Research* (FPR)/ *Participatory Technology Development* (PTD) and *On-Farm Research* (OFR)⁹⁴. OFR's core objective is testing technologies under farmers' conditions in order to find adapted agricultural technologies. On-farm experiments are

⁹² Focusing on farmers' households implies that FSR is research on small-scale level that views farms in a holistic manner and considers interactions between components (soil, water, crops, livestock, labor, capital, energy and other resources) as well as between components and environment in the farming system in order to better understand farm households, constraints and potentials.

⁹³ RHOADES and BEBBINGTON identify three types of experimentation: curiosity, problem-solving and adaptation experiments (RHOADES & BEBBINGTON 1996: 251ff.).

⁹⁴ Both are closely linked since FPR/ PTD by nature hardly take place distant from farmers' fields. Consequently, all FPR and PTD is OFR. Yet, OFR is not necessarily participative but it can serve as a platform for broad exchange through the creation of demonstration trials where exchange visits can take place (RM trials, see below). Farmers' participation in this case is very restricted.

considered as 'informal research'⁹⁵ and serve for experimentation about f.i. plant varieties, plant breeding and seed production, fertility management technologies, etc. It varies in the degree of involvement of and management by farmers. There are three types of on-farm trials: researcher-managed (RM), researcher and farmer-managed (RFM) and farmer managed (FM). They differ in terms of participation degree, design and evaluation criteria (see table 3).

Table 3: Types of On-Farm Research (OFR)

RM trials	RFM trials	FM trials
This type serves for OFR under more controlled conditions. The farm is used as laboratory to find out characteristics and physical potentials of the area, to screen available technologies, and to learn from farmers. Researchers control the research process.	RFM trials serve for exploring alternative treatments with respect to the key determinants of the proposed technology in FM trials. Both researcher and farmers have control over the research process.	Farmers control the research process. Evaluation of how the proposed technology fits into farming systems; assessment of the impact on farmers' performance criteria, the easiness or difficulties of management and adoption potential are core topics.

Source: ZAHUMENSKY 2013, adapted from AVILA 1987: 247

In terms of FPR/ PTD there is no unambiguous conceptual delimitation between the both approaches. PASTAKIA et al. suggest a suitable overview of evolution parallels of research-oriented FPR/ PTD and practice-oriented PRA/ *Community Based National/ Natural Resource Management* (CBNMR). According to the authors, the streams have differing agendas, evolved out of different perspectives and have a different impetus for change. Yet, they are categorized as converging PR streams resulting in farmer-led PR which is comparable to FPR/PTD as it is used in this paper. (PASTAKIA et al. 2002: 7) However, despite being scientific concepts both FPR/ PTD obviously have linkages to practical development issues. The author of this paper interprets FPR as slightly more akin to research issues while PTD is understood as slightly more akin to development issues due to the desired technological outcome of PTD. It can be characterized as a form of OFR with a more distinct focus on participation. Specific PTD features will be illustrated in the following.

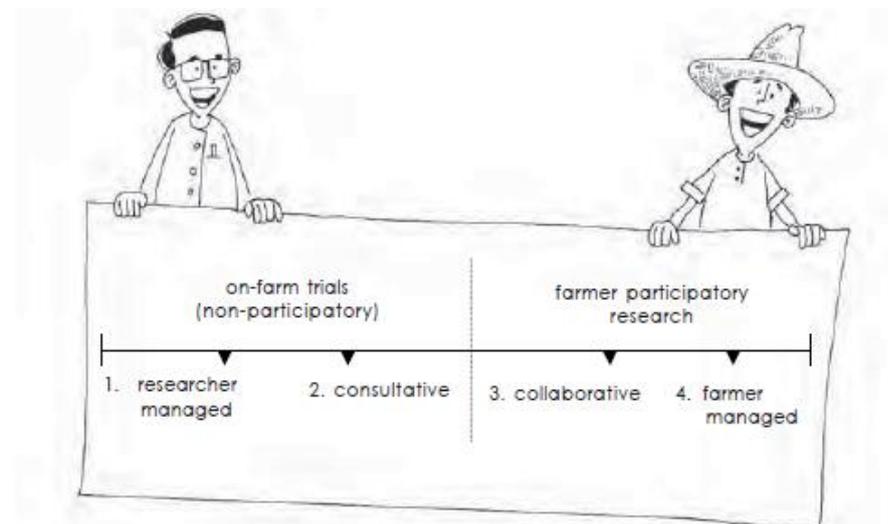
⁹⁵ Validity of experiments varies and may be difficult to assess. (HAVERKORT 1996: 8)

3.7 Participatory Technology Development (PTD)

From PTD viewpoint *participatory* on-farm research in the strict sense takes place only in the form of collaborative partnership of researcher and farmer (cf. figure 9) (NEUBERT 2000: 28f). "The question is not only whether [farmers] set the research agenda but how actively they take part in research, influencing the research topic, the process of research, and the results by their comments, proposals and arguments." (NEUBERT 2000: 28).

Farmers' traditional or indigenous knowledge takes on an important role during the PTD process while theoretical scientific knowledge in this context is only important as a means for supporting social change. The ideal case of consequent participatory on-farm research is farmer-managed research, i.e. experimentation with agricultural technologies⁹⁶. According to SELENER in farmer-managed PR "farmers are the main actors and decision-makers [...] developing technology through a process that includes problem definition, trial design, the implementation of experiments and the evaluation of results." (SELENER 2005: 14) and "the experimental capacity and indigenous knowledge of farmers are used to the maximum in this approach." (Ibid. 2005: 14). Participatory OFR from this view aims in the broadest sense on "Participatory Technology Development where there is no researcher" (VAN VELDHUIZEN et al. 2005: 165ff.).

Figure 9: Types of On-farm Research (OFR)



Source: SELENER 2005: 12

Nevertheless, farmer-managed research does not mean that researchers are excluded. SELENER attributes an advanced facilitating role to researchers in PTD: "The scientist's role is to assure that the community's local experimental capacity is fully utilized and to link farmers to information and resources for which the community has expressed a

⁹⁶ Experimentation takes place in order to improve productivity, as well as for processing and storing. This aims on improving farmers' livelihoods and ensuring their survival.

need but which are unavailable at the local level." (SELENER 2005: 14) Hence, besides social competencies for being 'participation agents', detailed knowledge about experimentation with agricultural technologies are required from researchers.

One premise of PTD is that informal experimentation⁹⁷ and technology innovation are natural to and necessary for farmers since they frequently have to adapt to an alternating environment. For this reason, particularly small resource-poor farmers are supposed to have full knowledge about the existing farming systems because they have experience in developing site-specific, often rain-fed and even sustainable and mostly *Low-External-Input and Sustainable Agricultural* (LEISA) that is primarily based on the optimal use of locally available resources ('organic by neglect'). (HAVERKORT et al. 1996: 4; BEHERA & SHARMA 2008: 24f) This knowledge is called *Indigenous Technical/ Technological Knowledge* (ITK). New agricultural technologies must emerge from farmers' needs, under consultancy of ITK in order to derive specifically tailored technologies which are widely adopted and that in the end really meet farmers' needs⁹⁸. For this purpose farmers and researchers conduct experiments on experimental research trials on farm level and evaluate the appropriateness of a technology according to their own criteria. These criteria are frequently different from those perceived by researcher⁹⁹. (SELENER 2005: 6; HORNE & STÜR 1998: 2) Locally-adapted improved agricultural technologies as an outcome on product level are usually as important as the improved experimental capacity of farmers as an outcome on process level (HAVERKORT 1996: 6). Moreover, improving farmers' inherent capacity for independent experimentation and innovation, increasing their awareness as well as knowledge is a coequal objective of PTD. However, it is at the same time the biggest challenge for PTD agents. (SELENER 2005: 11; VAN VELDHUIZEN et al. 2005: 166f)

⁹⁷ From scientific perspective, the benefits of informal farmers' research are "technical and organizational innovations that use scarce resources efficiently; signposts for new research that scientists in formal research and development systems might start to work on; and methods for conducting cost-effective research and classifying knowledge, with the farmer as principal researcher" (SELENER 2005: 11).

⁹⁸ PTD is considered as an applied research and its outcomes, i.e. technologies, have to be validated according to their adoption. Consequently, if technologies are not accepted by farmers they are considered as having failed. (NEUBERT 2000: 27)

⁹⁹ HORNE & STÜR give an example: "With forage crops, researchers usually focus on adaption and yield potential. Farmers, on the other hand, may select species based on such criteria as "greenness of leaf in the dry season", "softness of leaf", "hairiness of leaf"." (HORNE & STÜR 1998: 2)

Figure 10: Joint experimentation in OFR



Source: REJ & WATERS-BAYER 2005: 159

Experimentation is a creative process and therefore it requires creative methods. There are many qualitative and semi-quantitative methods, tools or techniques in PTD which can be used to collect and assess any type of information about communities and their needs, to rank priorities, to appraise feasibilities of activities, to discuss, observe and compare technologies and their performance, as well as to evaluate and monitoring the results or findings. The applied participatory tools are not specific to PTD but rather borrowed or derived from PRA and refined. They differ according to their purpose, according to the stage in the experimentation cycle and according to their appropriateness for experimentation on agricultural technologies. Generally, in PR there can be clustered specific techniques in the planning stage of project/ experimentation identification¹⁰⁰, tools during participatory planning stage¹⁰¹, tools during implementing stage¹⁰², and tools of participatory monitoring and evaluation (PM&E) at the end of an experimentation cycle. SALAS et al. have listed some of the most common PTD tools (see figure 11).

¹⁰⁰ To this belong all analyzing tools such as stakeholder analysis, needs assessment, gender analysis, participant observation, focus group discussion, semi-structured interviews, and other data collecting tools of PRA. (BRENDDEL 2002: 23)

¹⁰¹ In this stage instruments such as problem and objective trees, logical framework, operations plans, flow diagrams, bar diagrams, functions diagrams, and project planning schedules can be applied. (BRENDDEL 2002: 34)

¹⁰² Tools such as monitoring and evaluation matrices, indicators, input-output analysis, benchmarking, self-evaluation, pre-post-comparisons, SWOT-Analysis and reports are applicable in this stage. (BRENDDEL 2002: 39)

Figure 11: The tools of PTD

THE TOOLS OF PTD	
• Historical Diagram	• Biography of Local Knowledge Specialist
• Social and Resource Mapping	• Interview of Farmer Specialists
• Transect Walk and Diagram	• Memory Banking
• Seasonal Calendar and Daily Cycle	-Life History Matrix
• Matrix of Crops, Fruits, or Trees	-Landrace Technical Sheet
• Diagrams	-Seeds of Life History
• Drawings	• Triads of Seeds
• Ethno-Taxonomy	

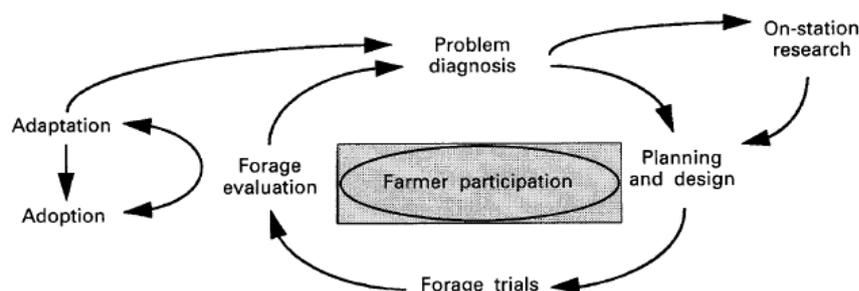
Source: SALAS et al. 2003: 53

3.7.1 The PTD process

In general, the PTD experimentation process is often described as a cycle. HORNE & STÜR illustrate this cycle in the context of a small-holder project about forage production (see figure 12). The PTD process is split into typical project phases of problem diagnosis, planning, implementation of farmer managed experimentation trials, and evaluation. Subsequently, adaption and adoption of technologies react on new or altered problem diagnoses. Furthermore, findings from formal on-station research about farmers' problems can be compared with experimentation results and suggestions for advanced experimentation can be incorporated into the project planning. The sequence of activities is not rigid but in practice there are rather overlaps, gaps and iterations as required in specific contexts (HAVERKORT 1996: 9). Likewise to P(A)R, the PTD process has to be understood as a cycle of progressive improvement. As soon as one PTD-process has 'finished' with the dissemination of a suitable technique a new cycle should start with an improved experimental design and with increased farmer engagement until farmers' full ownership of the research is achieved¹⁰³. PTD thus is a dynamic and iterative process albeit it is not supposed to be endless.

¹⁰³ "Researchers are still needed even if farmers and development agents undertake PTD because they can support the farmers' research efforts in various ways" (VAN VELDHUIZEN et al. 2005: 169). Furthermore, PTD can only be conducted without researcher provided the PTD-process is documented for wider recognition, provided methodological training of experimentation and data collection takes place, as long as new information on research findings are provided, and new options are suggested for testing, as long as technical support in form of f.i. soil analysis is provided, and provided complementary on-station research accompanies participatory OFR in order to deliver further critical issues that might not possible to be surveyed under uncontrolled conditions by farmers in the field. (VAN VELDHUIZEN et al. 2005: 170)

Figure 12: The PTD process in a "Forages for Smallholders" project



Source: HORNE & STÜR 1998: 4

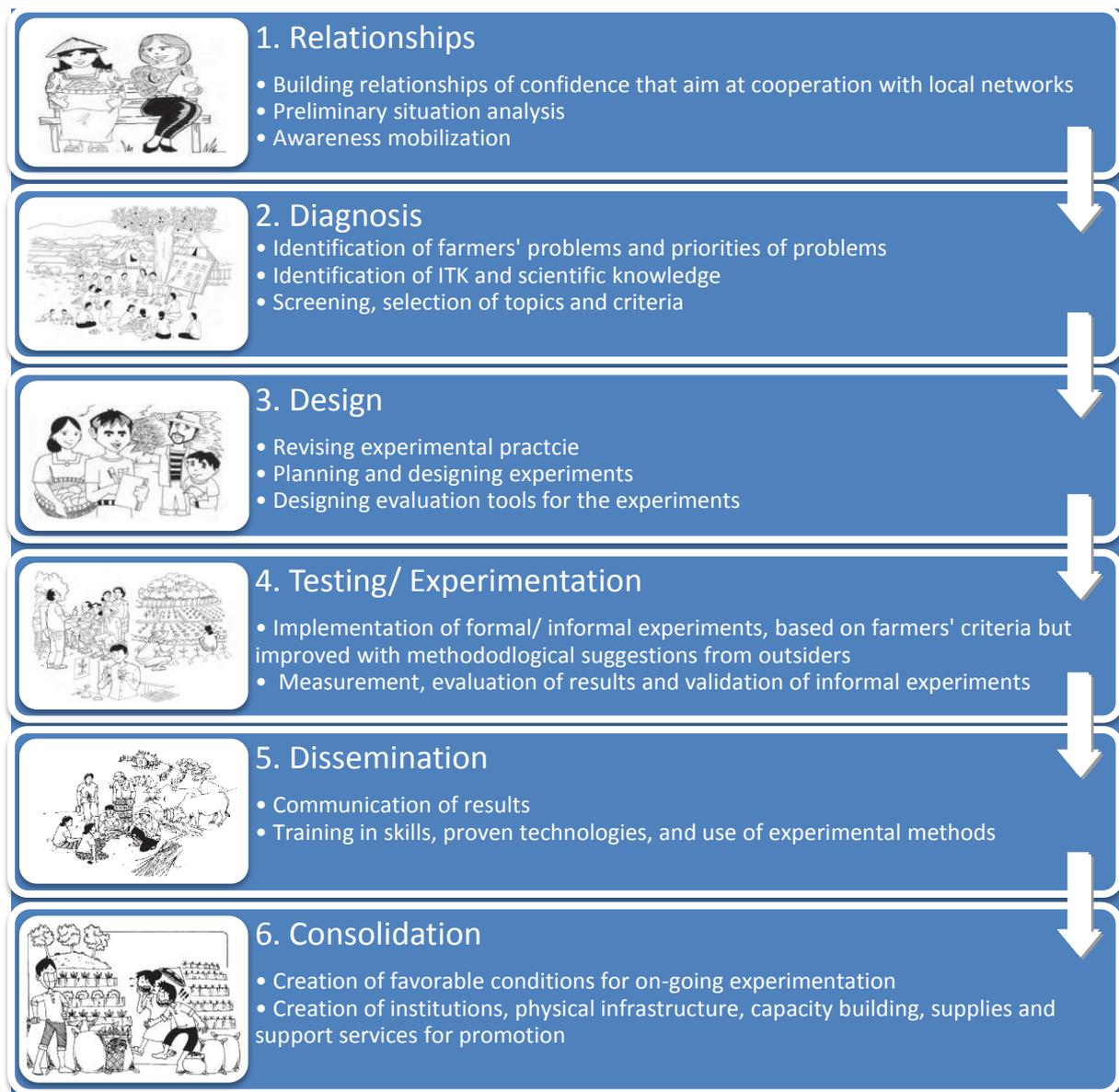
Despite its high dependence on local contexts and its complexity, the steps in PTD process can even be specified, and guidelines for the process operation can be derived (see figure 13). The typical PTD-steps are problem definition, realization of experiments about agricultural technologies, and the evaluation of technology performance/ and of the PTD process. In the diagnostic phase¹⁰⁴ farmers and researchers identify problems and needs they want to address. Afterwards, in the planning and design phase, they rank problems, chose the most urgent ones, identify potential solutions, design a prototype technology and decide about how to test it (layout of on-farm experimentation trials). During the experimentation phase¹⁰⁵ the technology is tested in the field, observed and finally evaluated: "Evaluation not only indicates which technologies are showing promise for extension to other farmers, but also provides insights into farmers' criteria for judging technologies that can be used to guide on-station research." (HORNE & STÜR 1998: 4). In the final adaption and dissemination stage, farmers continue testing the technology and disseminate it¹⁰⁶ (technology extension). Ideally, the PTD-practice itself is desired to disseminate spontaneously in order to encourage other farmers to participate in informal technology experimentation on their own. (cf. SELENER 2005: 14)

¹⁰⁴ VEL et al. accentuate the importance of analyzing all aspects of farmers' reality, e.g. also social backgrounds, and reducing to consider only *indigenous technological knowledge* (ITK) during the PTD process. (VEL et al. 1996: 152)

¹⁰⁵ It plays a vital role to encourage farmers to 'play with' technology options because farmers adapt rather than adopt technologies. (HORNE & STÜR 2005: 177)

¹⁰⁶ Disseminating technologies means mainly to report back to the village and other farmers so that these can expand and integrate new technology options which proved to be promising on their own farm. Dissemination occurs also by demonstration effects: once other farmers observe visible impacts they will start testing the technologies, too. This spontaneously initiates sustained PTD. (HORNE & STÜR 2005: 178f)

Figure 13: PTD-activities



Source: ZAHUMENSKY 2013, adapted from CRAMB 2005: 145ff.; BEHERA & SHARMA 2008: 24ff.; SALAS et al. 2003: 89ff.; HORNE & STÜR 2005: 172ff.; HORNE & STÜR 1998: 2ff.; BESSETTE 2005: 94ff.; LINQUIST et al. 2005: 58ff.)

3.7.2 Strengths of PTD

The empowering benefits of participation processes have already been illustrated. In PTD empowerment can be distinguished into techno-economic empowerment and socio-cultural empowerment. On the one hand, the recognition of indigenous knowledge systems and local innovations, the recognition of traditional indigenous worldviews and culture as well as the recognition and rewarding of local innovators is a source of socio-cultural empowerment. On the other hand, a source of techno-economic empowerment is the validation of farmers' solutions or innovations, the discovering of science behind farmers'

practices and innovations, as well as the development of value-added technical solutions for local systems. (PASTAKIA et al. 2002: 10) The high estimation of *Local Technological Knowledge* (LTK = ITK) in the PTD process is relatively new, even farmers sometimes have to rediscover it since, in the past, its recognition was not self-evident¹⁰⁷:

"With the spread of models of western education, farmers have tended to lose confidence in their own knowledge systems. Much of the local knowledge was getting lost as the youth did not show any interest in learning traditional concepts and skills from their elders (Pastakia 1996). It is in this context that any form of recognition of LTK and local innovations can go a long way to arrest the erosion of local knowledge and restore the confidence of local farmers in their own knowledge systems."

(PASTAKIA et al. 2002: 10)

Moreover, PTD can be a source of empowerment on *individual* level. In contrast to other approaches that address mainly group or community level farmer-managed trials of PTD contribute to a capacity building on individual level since every participating farmer takes over responsibility for his trial. Already a minimum training in formal research methods to local experimenters can make it possible to organize farmer-managed trials. (PASTAKIA et al. 2002: 11ff.) Through charging farmers own initiative and recognizing farmers' capacity for innovation PTD generates great enthusiasm and energy. This enthusiasm motivates for further experiments and wider sharing of ideas. Farmers are empowered, local ownership increases, and partnerships are consolidated on a more equal footing. (REJ & WATERS-BAYER 2005: 164)

Another basic advantage of PTD is its spreading potential because PTD can involve a vast number of actors: men, women¹⁰⁸, farmers, field agents, governmental agencies, and NGOs. In this way, lots of stakeholders can be addressed for the purpose of strengthening local research and adaptive capacities for innovation. Despite the fact that PTD can result in site-specific innovations that may not be applicable in other localities PTD can also serve as source of inspiration for farmers in other areas. Besides, PTD takes place very close to farmers, under efficient use of local resources (manpower as well as ITK). Thus, it is a cost-effective process as it can take place without highly-paid scientists. Additionally, the high estimation of ITK contributes to an equalized relationship between researchers and farmers since formal research methods can validate ITK through the PTD process and vice versa. (VAN VELHUIZEN et al. 2005: 168f, see also PASTAKIA et al. 2002: 10)

¹⁰⁷ Generally, the inclusion of *Indigenous Technological Knowledge* (ITK) is not very difficult to achieve once the farmers decide to actively participate. It may be more challenging to sensitize farmers for the richness and value of their traditional knowledge and to create a favorable climate where farmers want to disclose this knowledge.

¹⁰⁸ Nevertheless, PTD generally refers to male farmers while the role of women as actors performing important farming activities such as weeding, sowing, harvesting, and watching over animals, etc. is often disregarded even in PTD practice.

3.7.3 Constraints of PTD

PTD was illustrated as offering great opportunity for individuals' technical and social empowerment. Yet, even in PTD where farmers are intimately involved in the participatory process participation can occur in a scope that ranges from 'empowering' to 'functional participation' or 'pseudo participation'. Besides the general strong technology orientation, difficulties in the sustainability and scaling-up of impacts and the overcharge of seeking for the change of local frame conditions are points of criticism.

PTD has come to mean different things since it can be interpreted in a technical or in a social way, and hence degree and type of involvement of local people varies: "In the process of technology development, an empowerment focus would be more inclusive while a functionalist approach would be more selective. The benefits of technology development would vary depending on the approach adopted." (PASTAKIA et al. 2002: 5). PTD practitioners often find themselves in a dilemma because they have to balance different objectives, i.e. meeting the requirements of research efficiency and to achieve equity and empowerment. (PASTAKIA et al. 2002: 5) In this regard, VEL et al. lament a widespread strong technology orientation in PTD:

"The major problem the new approaches try to solve is how to improve the effectiveness of agricultural research in meeting the needs of small, resource-poor farmers. But should not the central problem be how to improve the effectiveness of our efforts to improve these farmers' living conditions? Better research is only one part of this. [...] Why is it that we always think that other technology (either modern, appropriate, locally adapted, or ecologically sound) is The Answer to the problems of small farmers? Social, political or economic constraints are frequently more limiting than technological constraints."

(VEL et al. 1996: 151)

The strong technology orientation in PTD is comprehensible since it represents the more tangible way of realizing PTD in contrast to changing local frame conditions in order to facilitate local self-organization, active self-initiative, and sustainability¹⁰⁹ of PTD. Of course, only if farmers' groups and organizations are able to form networks of exchange and self-organization institutionalization of PTD can be achieved (cf. HAVERKORT 1996: 12). Yet, it is a mammoth task for PTD practitioners to support the development of local political and infrastructural frame conditions which allow for local group formation that, in turn, promotes technology dissemination and consolidation. According to VEL et al., there is another empowerment-related constraint that is especially relevant for PTD as it takes place in rural surroundings. According to the authors, awareness rising and critical *conscientisation*

¹⁰⁹ Despite using local human and natural resources, sustainability is not a natural outcome of PTD. Of course, technology development bases on low levels of external inputs, but sustainable farming (and institutionalization of group formation or self-initiative) needs to be formulated additionally in order to ensure other sustainability objectives of PTD. (cf. HAVERKORT 1996:12)

of rural target groups is challenging since in some rural regions a 'culture of silence' is still prevailing:

"Especially in isolated areas where local traditions are still very strong, the capacity of small farmers to analyse their situation critically and think of it objectively as something that can be altered through their own action, is very limited. [...] Asking the farmer [about] their major problems might not give the expected result. A precursor to any development activity is to bring farmers to a level of awareness and self-confidence which will facilitate active participation."

(VEL et al. 1996: 152)

The above statements illustrate how local conditions and culture can be an obstacle for PTD. Especially external PTD researchers are asked to rethink their definition of science and their role as development agents since PTD interfaces strongly with development. "Most natural scientists are by training not prepared to play the role of a facilitator" (PASTAKIA et al. 2002: 4). In some cases it might be even difficult for scientists to accept farmers as peers and experts in their own subject because of their possible illiteracy. The clash of knowledge systems plays a part in contributing to socio-cultural difficulties. Since "[l]ocal knowledge systems have their own language, systems of classification and interpretation which do not always correspond to the prevalent modern (westernized) knowledge system" (Ibid. et al. 2002: 3) dialog between the two knowledge systems should be internalized especially by outside scientists in order to understand local culture and worldviews. From farmers' perspective, a change of attitudes might also be required in order to accept a supporting function of formal research which tries to contribute objectively to the improvement of farmers' livelihood (VAN VELDHUIZEN et al. 2005: 169). For a better dealing with such subtle socio-cultural issues and biased attitudes, PTD requires more than technical and scientific skills of scientists but likewise an intense briefing in participatory methods:

"Basic communication skills are more important than the tools of PTD. [...] listening to farmers (not just hearing), using probing questions to gain deeper understanding of farmers' needs, working in partnership with farmers to solve their problems and providing information in a neutral manner [...] flexibility [are] essential. [...] These skills are not obtained overnight or from formal training courses, but from field experience. Without these skills, the PTD tools [...] are useless."

(HORNE & STÜR 1998: 8)

Moreover, the character of an open-ended process challenges PTD as it increases the probability of non-participation. Apart from the risk that farmers might be discouraged due to unpredictability of outcomes and the relatively high investment of time and individual resources, development agents and researchers might also lack confidence in this open process because of "possible sanctions by not meeting expectations in transferring technologies from research stations" (VAN VELDHUIZEN et al. 2005: 169).

Although it is a problem of PaR, the impact of technology generation is of special relevance in PTD as impacts decide about its success or failure. One crucial problem of PTD is the inherent difficulty of scaling-up and the associated sustainability problem. If technologies are attempted to be applied in a standardized manner on a larger scale though they have

been developed location-specifically, they are most likely to be irrelevant for different local conditions. "Even in a success scenario, [...] a big multidisciplinary research team with several years of work produces at first only locally useful solutions. How can research of this type be able to tackle problems in marginal areas and of resource-poor farmers on larger scale?" (NEUBERT 2000: 42). Usually, the scaling-up problem is tackled through participatory extension and capacity building, and through research that is conducted by users¹¹⁰.

With regard to PTD practice PTD faces a variety of unexpected practical limitations. It is one thing to advocate farmers' active involvement but it is another thing to practice it as well as to practice it for the benefit of *all* persons involved. For instance, in practice, farmers often face difficulties in identifying research questions for the PTD agenda or they point out research questions that are not manageable by research due to political limitations or uncontrollable factors such as climate. Apart from that, farmers' research questions may be of minor importance for research purposes. (NEUBERT 2000: 30) Another important practical problem is that the active involvement in a participatory project is not necessarily a proof that the people approve of the participatory effort since many of the local reactions are strategic. Farmers may see their participation as a 'gift' to the researchers and wait for something substantial (funds, tools or seeds) as a service in return. (NEUBERT 2000: 44) In this case, participation would only be a kind of pseudo-participation.

Finally, PTD faces a practical problem with regard to target groups. PTD cannot be a panacea that can include all community groups in the process because including one group always excludes another: "There is always the political question who should and can participate." (NEUBERT 2000: 31). Selecting participants increases the risk of power influence of the already powerful since the voice of the less powerful might not be heard. On the other side to take the poors' side and to seek especially for the inclusion of the marginalized may be unrealistic due to the lack of access to local agricultural resources of the extremely poor, marginalized or landless. However, such access to resources is often a base for agricultural innovations. (Ibid. 2000: 31) Even if those people are 'reached' by PTD agents, they might simply not be able to participate as they might lack parcels of land where on-farm PTD experimentation trials could be implemented.

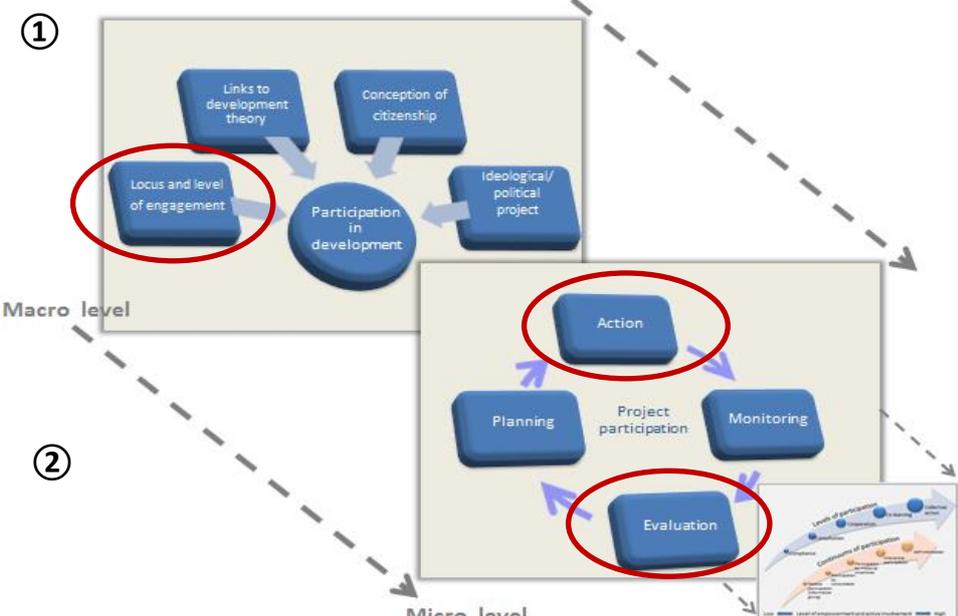
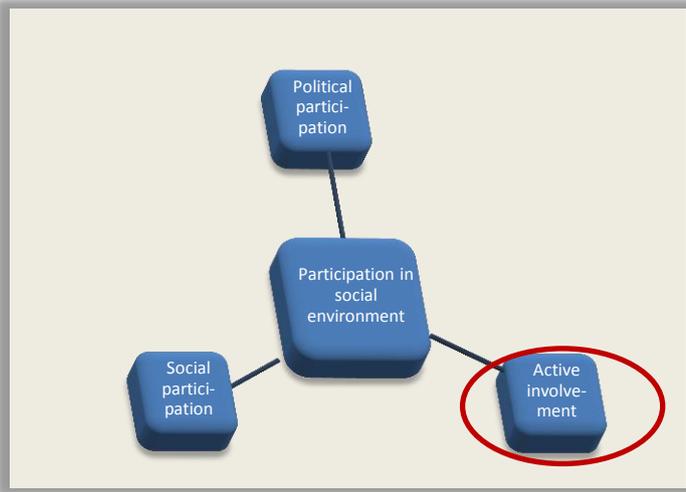
¹¹⁰ NEUBERT criticizes these solutions for being insufficient. For a more efficient participatory transfer of technologies he suggests a model for a systematic comparative evaluation and analysis of case studies in order to use transmit lessons learned. Such an evaluation and analysis model requires a good documentation of any planning, implementation or evaluation outcome, of any actions and processes; the documentation of all useful local technical solutions; the development of practical agro-ecological typologies; the development of more general categories and concepts for the description and analysis of relevant elements in specific local social fields, and the development of ways for impact control (for instance PM&E). Such a comparative (basic) research of case studies would allow for the generalization and therefore can serve for the scaling-up of impacts. (NEUBERT 2000:43f)

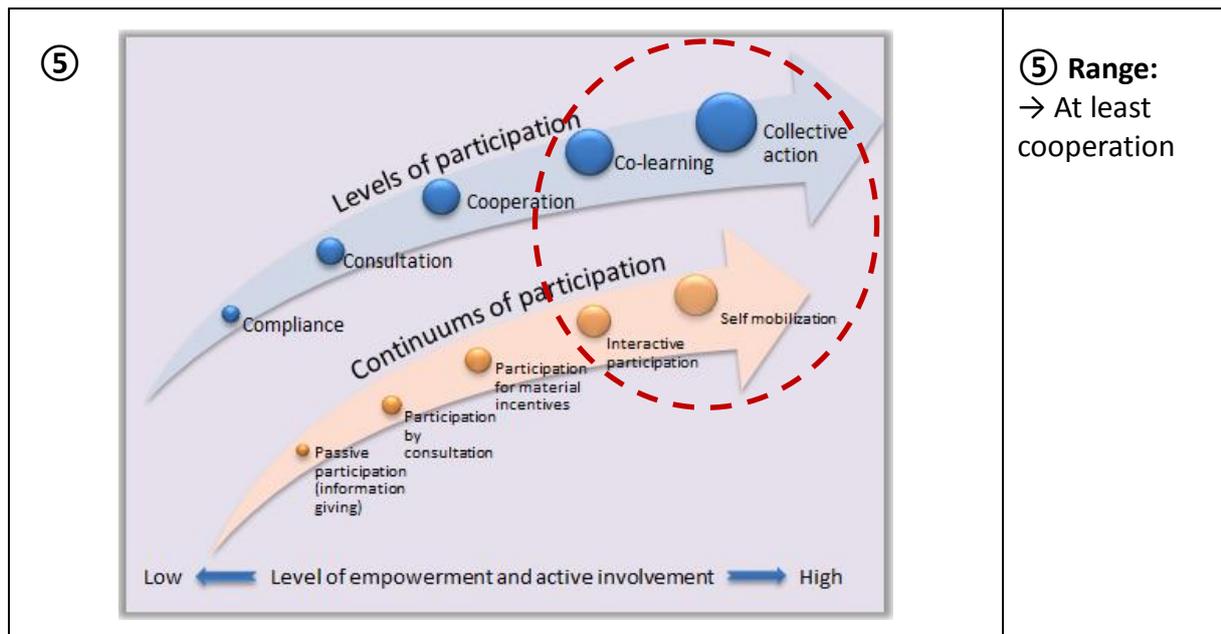
Summary Chapter 3

In this chapter, participation has been introduced as a label to indicate user-oriented activities, and as commitment to the improvement of peoples' livelihoods. In the first instance, various dimensions and purposes of participation have been illustrated for three reasons. First of all, it was intended to give a notion about the vast number of possible interpretations of participation as well as to illustrate the possible starting points for research about participatory research approaches such as PTD. After all, the interpretative plurality of participation combined with the 'blurred contours' of the development concept reveal the pertinence of post-development critiques, and at the same time their problematic in delivering 'alternatives to development', i.e. self-determination, self-recovery, and proactive engagement which are closely linked with participation.

With regard to the following case study the approach to participation in this paper needs to be explained for a better understanding of the research procedure as well as for transparency purposes. Hence, five different elements of the dimensions of participation were selected and emphasized. The main interest at scrutinizing the purposes of participation is laid on levels of control and active involvement of participants during participatory processes since this is a relevant topic for the investigations in the context of the case study. As the evaluation of participatory PTD-tools during the case study was located in a local PTD-project there are selected the project phases of main relevance: the project stage of action and the stage of evaluation. Furthermore, the procedural dimension of participatory tools is clearly focused on. At reflecting the interesting spheres how participation can take place emphasis was laid on active involvement. Finally, the highest level and intensity of continuums of participation were envisaged: collective action and self-mobilization. The following table summarizes the selected participation emphases in this paper visually (see table 4).

Table 4: Selected emphases of participation for the case study of this paper

Dimensions of participation	Selected emphasis
<p>①</p>  <p>Macro level</p> <p>Micro level</p> <p>②</p>	<p>① Purpose: → Locus and level of participation</p> <p>② Project phase: → Action and evaluation</p>
<p>③</p>  <p>vs.</p>	<p>③ Process (means) or product (end): → Process</p>
<p>④</p> 	<p>④ Spheres: → Active involvement</p>



Source: ZAHUMENSKY 2013

Later in this chapter, PTD in all its dimensions was stepwise approached. Until then, participatory research and development have been used in an undifferentiated way. Yet, it is rather their functional interplay that is envisaged since PTD is located at the interface of research and development practice. Subsequently, the science and agriculture related components of PTD have been illustrated. The perspective has been narrowed through illustrating *Participatory (Action) Research (P(A)R)* and *Participatory Agricultural Research (PaR)*. The latter is understood as a combination between participatory research and agricultural development objectives/ development practice. Besides, P(A)R was illustrated as the case study of this paper represents a P(A)R itself. The imagination of a 'spiral science' served as a base to achieve the outcome of mutual learning and increased consciousness by the end of the case study. Moreover, PaR was addressed as a form of applied P(A)R in agricultural science. It was accentuated that in PaR practicality is of higher importance than theory and scientific knowledge. The differing approaches have been referred to because participatory research and development follow different objectives and have different criteria for success which are expected to coalesce in PTD. This coalescence can be beneficial but at the same time it is difficult to harmonize the differing objectives. On the one hand, participatory development practice aims on the sustainable improvement of local conditions and livelihoods through participatory projects. Their success is measured according to whether target groups end up living better as a result of the project activities. Hence, participatory development rather aims on involvement of locals in a project. Whereas, on the other hand, research aims on knowledge production, testing and developing solutions in order to improve local conditions. Participation in research is rather a means for achieving better user-orientation. The success of participatory research is measured according to the gained knowledge about how and why changes occur or not.

Finally, PTD was illustrated in detail since it represents a challenging but promising participatory approach for active involvement of farmers due to its high potential for social change, collaboration, and empowerment for self-mobilization. One of PTD's crucial strength is to get access to local technological knowledge *and* to integrate applied technology development with an actor orientation. A critical constraint of PTD is its strong emphasis on outcomes on product level whereas the process level seems to be frequently disregarded. This may arise from the fact that PTD evolved within natural science. Yet, social science elements are just as important as natural science elements since empowerment can take place as techno-economic empowerment as well as in form of socio-cultural empowerment. In facilitating empowerment, PTD practitioners have to break through various obstacles such as mediation between contrasting worldviews, skilled facilitation of PTD processes, scaling-up PTD impacts and turning them sustainable, handling unequal power relations and group dysfunctions. Hence, PTD is a methodology that should always be critically reflected and negotiated between practitioners, researchers and participants.

For the purpose of the case study of this paper one finding that is associated with PTD is crucial: there is rarely another participatory approach where farmers are addressed on individual level with such intensity as it is the case in PTD. This arises from the responsibility that every farmer has to take over for the experimentation trial on his parcel. A very important aspect for this work is that this strong charging of farmers' individual initiative may result in great enthusiasm and energy which in turn may result in motivation for active involvement and long-term empowerment. A crucial insight at scrutinizing participation is the realization that specific scopes of participation such as participation levels, degrees, and intensities can be externally influenced. In this respect, stimulating the motivation for participation plays a vital role. Consequently, some clarifications about the motivation of individuals are necessary what will be done in the following chapter.

4. Motivation

The term motivation derived from Latin '*movere*' which means to move. Besides movement the term motivation contains the term '*motive*' in the sense of reason, cause, or driving force for action. Motivation has to do with movement since it refers to the driving force which brings us to put us into motion and to deliver performance. In contrast, a lack of motivation leads us to omit activity. (RUDOLPH 2009: 1ff.) In the precedent chapters much was reflected about empowerment and *active* participation. Hence, enlightenment about proactive behavior, especially about motivation that results in active participation is relevant for the purpose of this work since participatory tools are intended to be proved on their positive effectiveness on participants' motivation to be proactive. Moreover, individuals are driven by specific motives for action. Exploring those is also helpful at analyzing the motivation structure of individuals and for the finding of starting points for the stimulation of motivation.

Looking for the explanation of human motivation is a difficult task since cognitive processes (e.g. perceptions, memory, thoughts) determine activities as intermediate instances between stimuli (such as aspirations, needs or desires) and reactions which evoke decisions on activities/ behavior¹¹¹. Such mediating cognitive processes are personal and difficult to assess. Besides, there is also a lack of appropriate measuring tools to measuring motivational personality dispositions and situational effects on decision-making (RUDOLPH 2009: 9). However, at least it is common sense in motivational research that individuals can be motivated for activeness through situations which provoke needs or aspiration and through personal dispositions/ personality types. Behavior thus is conceptualized as a product of interaction between person and situation. (RUDOLPH 2009: 89ff.; RHEINBERG 2002: 15 and 61) Hence, motivational research is generally concerned with motives for goal-directed human behavior, the manifestations and intensities of motives, and it asks for underlying principles such as factors that make emerging desires attractive. Yet again, motivational research can be approached from different perspectives. In the context of this work we ask on the one hand for motives behind actions. Such motives often arise from unconscious individual desires or needs. Accordingly, motivation is understood as an accumulated force that often functions unconsciously and/ or mechanically. On the other hand, motivation is conceptualized as a process model of rational calculation for goal-directed action. This approach considers motivational processes as a result of equitable considerations and conscious decisions. (cf. ROTHERMUND & EDER 2011: 57; RUDOLPH 2009: 7f) The author of this paper considers both approaches as interrelated and continues illustrating them in the following as collateral processes.

¹¹¹ There are motivation theories which go beyond theories of sole *Stimuli-Reaction*-concepts where only observable behavior is regarded. Advanced so-called *S-C-R*-theories include intermediate cognitive processes. (RUDOLPH 2009: 13)

This chapter is far away from illustrating a comprising theoretical approach about complex psychological processes of motivation. It is rather intended to give a condensed notion about motivation and its role for participation on individual level. For this reason the following mathematical equations rather serve for illustration purposes, and the author foregoes the mathematical derivation of the used variables.

4.1 Motivation as an interplay of directed forces and as rational calculation

The psychologist KURT LEWIN was already marginally mentioned in the context of participation approaches. He is a renowned pioneer of experimental social psychology and gestalt psychology, and he shaped a concept of motivation as an interplay of directed forces¹¹². In his *field theory*¹¹³ LEWIN argues that explanation of human behavior is possible only if the forces that affect individuals in a given situation are regarded (LEWIN 1936). According to LEWIN, individual and group behavior (B) thus is a function between actual personality characteristics (P) and conditions of a situation/ environment (E) :

$$B = f(P, E)$$

Environment is linked with the person insofar as in the subjective perceived living space needs can emerge that cause innerpersonal tensions in a certain cognitive field of a person. A tension activates a process of motivation to effectuate an action. Objects which correspond to the tension(s) allow individuals to satisfy their needs or aspirations. For example, if someone feels cold there will be stimulated a cognitive field that causes a tension due to non-satisfaction of the need to feel warm. As a consequence, the person gets unbalanced. Warm clothing is the object to satisfy the need of feeling warm, and thus putting on a warm clothing appears as goal. Once the underlying need is satisfied the tension is eliminated. The personal variable influences the decisions about how fast a person feels cold and how quickly the person reacts with which means on the respective need. In LEWIN's theory needs do not exclusively refer to physiological necessities since the desires to complete a task or to solve a problem produces similar states of tension. (RUDOLPH 2009: 68ff.; GRAHAM & WEINER 1996: 69)

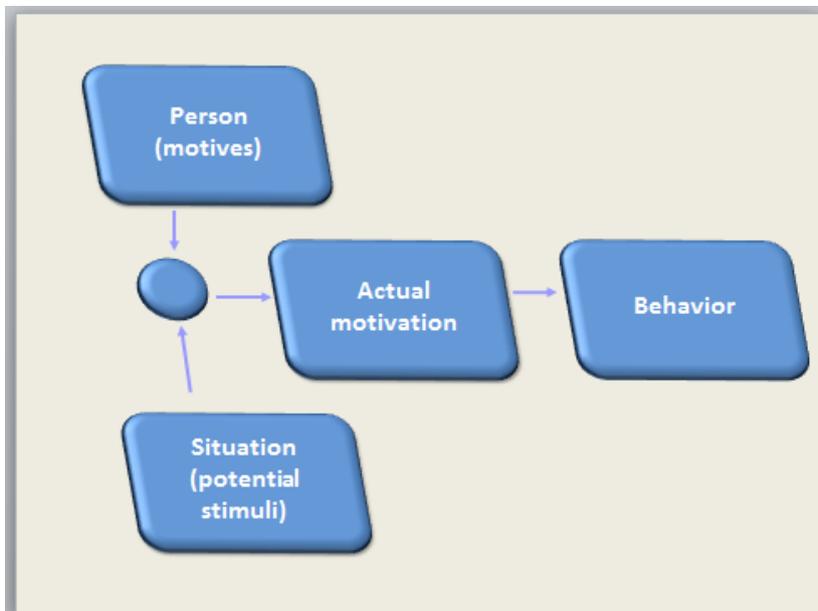
The following figure illustrates the synergy of person and stimulating situations that create motivation and influence proactive behavior. Both environment *and* personal motives are vital for the motivation process since the missing of one of these factors inhibits the

¹¹² In contrast to the concept of directed forces, drive theories conceptualize forces as undirected and nonspecifically applicable for any behavior. (ROTHERMUND & EDER 2011: 21)

¹¹³ *Field theory* is the concept which incorporates motivational phenomena in the broadest way (GRAHAM & WEINER 1996: 69). LEWIN designs individual personalities as constructs which consist of different fields, borderlines, and adjacency. Such fields represent different needs or goals of a person; adjacent fields signify similar needs or goals, distant fields signify different needs or goals. (cf. RUDOLPH 2009: 66ff.) The living environment with its forces represents a major influential factor for needs or goals of individuals, and consequently for their action and motivation for action.

Figure 14: Synergy of personal and situational factors during the originating process of motivation

emergence of motivation. Motivation represents an intermediate step between stimuli and behavior, and it works as accumulated force. (ROTHERMUND & EDER 2011: 92ff.)



Source: ZAHUMENSKY 2013, adapted from ROTHERMUND & EDER 2011: 93, own translation

This scheme approaches motivation from a motive-driven perspective and in a very general manner so that one gets the impression that the number of stimuli, needs, and reactions is unlimited. In social situations of interaction with other individuals motivation appears even more complex since the stimuli and interrelations of cognitive processes are multiplied due to the increased number of individuals and their specific motivation processes.

In order to retrace individuals' motivation more precisely the possible personal motives should be specified. Content theories of motivation reduce this complexity of motives, systematize fundamental motive forces and the differing motive structure of individuals. For the purpose of the case study of this paper focus is laid on motive theories as a form of content theories¹¹⁴ in social contexts. Fundamental specific social motives are power, relationships and achievement.¹¹⁵ These reactive and situational motives differ from

¹¹⁴ Besides, content theories of motivation involve topics such as goal setting or implicit and explicit goals. (cf. ROTHERMUND & EDER 2011) These aspects are also relevant for the case study.

¹¹⁵ For example, if a student decides to join a learning group he/ she can be motivated through a relationship motive and joins the group in the hope to make friends and with the prospect to achieve support. Content-oriented contributions for this type are less important than being accepted by other group members and preserving group peace. Students who are motivated by power motives are supposed to join the group in order to acquire a dominant position within the group and to test the own decisive power and control of group decisions. For this character content-related contributions are only relevant insofar they offer a means to exert influence. In contrast, the achievement motivated student is assumed to use the learning group as

more unconscious basic motives such as needs of hunger and cold although these also belong to the personal structure of an individual.¹¹⁶ Social motivation can be characterized as an active motivation state through which behavior is controlled rather consciously. (ROTHERMUND & EDER 2011: 91ff.) In sum, individuals' motivation and their chosen behavior can be reconstructed according to the underlying individual motive and its intensity of manifestation in specific situations. The critical question is how can be explained the driving force which determines the type of chosen behavior as an outcome of interaction between person(s) and situation. LEWIN offers an equation for the calculation of this motivational force:

$$F = f(t, G)/e$$

According to LEWIN, the motivational force (F) of a person to reach an environmental goal - be it the satisfaction of a physiological need or the desire to perform a task - is determined by the three factors tension (t) or the magnitude of a need; valence (G) or the properties of a goal object; and the psychological distance of the person from the goal (e). The motivational force is greatest the closer one is to the goal (i.e. (e) approaches 0) as well as the higher is the tension and the valence attribution. (GRAHAM & WEINER 1996: 69). To explain this by taking the example of the person who is feeling cold: if a person feels cold he or she reacts with the characteristic action of putting on warm clothes in order to eliminate the innerpersonal tension. If strain relief successfully happens through the respective objective (warm clothes) individuals attribute a positive valence to the object. The higher the probability of the best satisfaction of the need through specific conditions of the object the higher is the attributed valence of the goal object.¹¹⁷

In the context of this paper social motives and especially the achievement motive is of special relevance since it is related to professional knowledge and related skills¹¹⁸ which in turn, are determining factors for *Participatory Technology Development* (PTD). For this reason achievement motivation will be illustrated more detailed in the following. It serves as

platform to prove the own expertise and to compare it with the knowledge of other group members. For this type content-oriented contributions are the main benefit of joining a learning group. (ROTHERMUND & EDER 2011: 91ff.)

¹¹⁶ Basic motives are caused by physical deficit states that cause tensions which have to be eliminated. Hence, they evoke action more or less situation-independently (e.g. hunger is a innerpersonal need and independent from the situation). In contrast to the basic motives other specific social motives are restricted to be stimulated only in convenient situations whereupon individuals react with characteristic behavior according to their directing motive. (ROTHERMUND & EDER 2011: 91ff.)

¹¹⁷ As opposed to the general assumptions of the equation individuals can compensate a higher distance to the goal object through a higher valence attribution to the expected satisfaction degree of the goal object: the person can either prefer a simple piece of clothing that is immediately available and warms up quickly but only moderately or the person will delay the satisfaction of the need and spend more time f.i. to going home in order to look for another piece of clothing that warms up better. In the latter case high valence is attributed to the satisfying potential of the goal object despite the higher distance to the goal.

¹¹⁸ Achievement motivation is identified as the second achievement determinant besides professional knowledge and respective skills. (SCHULER & PROSCHASKA 2001: 7)

a conceptual basis for the reconstruction of stimuli conditions as well as for the derivation of a measurement procedure for individual variations in the manifestation of motives or motivation degrees that are relevant for empowerment and active participation. Furthermore, achievement motivation concepts consider inter-individual differences in contrast to most motivational theories where inter-individual differences in motivation are put aside in behalf of the objective to discover regularities and the claim for general validity.

4.2 Achievement motivation

According to SCHULER & PROSCHASKA, achievement motivation appears in any situation of aspiration for achievement. Hence, achievement motivation can be determined as a broad trait-oriented construct¹¹⁹ (SCHULER & PROSCHASKA 2001: 5). Substantially, achievement motivation characterizes a behavior that aims on the self-evaluation of competencies by means of quality criteria. These criteria are oriented on subjective perceived expectations of success or failure of behavior¹²⁰. More precisely, the criteria depend on the respective, individually attributed valence of usefulness of a goal/ task which in turn serves as variable of incentive for contemplable action. Positive valence is generally attributed to success while negative valence is attributed to failure. Whether and to what end the achieved goal is useful is not an exclusive question of achievement motivation but is highly relevant for achievement motivation as soon as performance-based pleasure emerges through one's own competency or efforts. (RHEINBERG 2002: 62f) "Achievement motivation is the endeavor to increase or at least to maintain the own competency as high as possible in all those activities in which one accounts a measure of quality as obligatory, and of which the execution therefore can succeed or fail." (HECKHAUSEN 1965: 604 as cited in ROTHERMUND & EDER 2011: 105, own translation). Thus, the decisive factor of achievement motivation is the quality of competency itself and less the associated consequences (e.g. recognition, compliments or critique) (ROTHERMUND & EDER 2011: 105).

The above equations of behavior and motivational force have been illustrated by using an example of a physiological need but they apply also to social needs or aspirations such as coping with difficult tasks. According to MURRAY (MURRAY 1938), the achievement of a goal or the accomplishment of a task is a general human desire: "To accomplish something difficult. To master, manipulate or organize physical objects, human beings, or ideas. To do this as rapidly, and as independently as possible. To overcome obstacles and attain a high

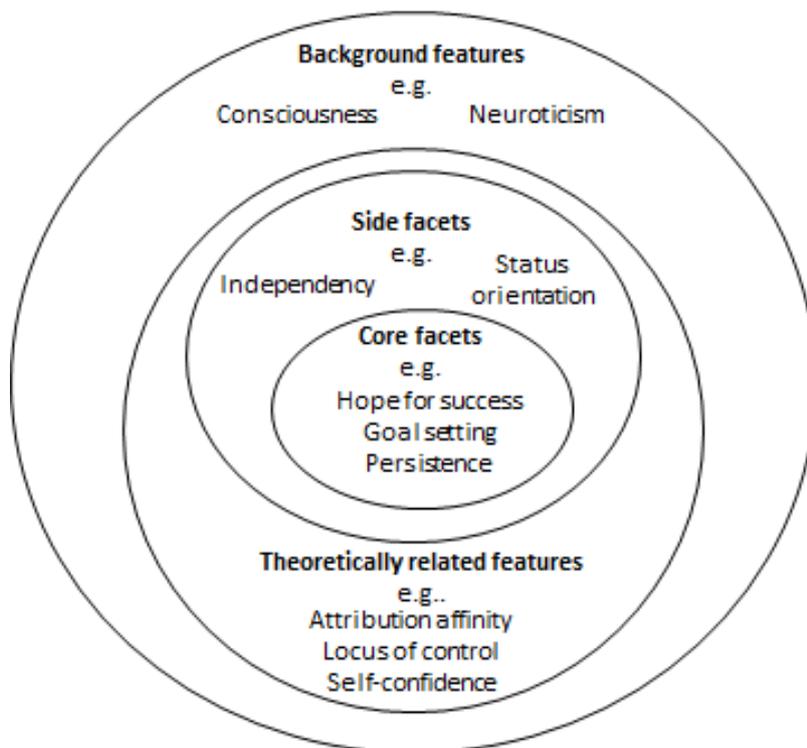
¹¹⁹ In contrast to SCHULER & PROSCHASKA dominating achievement theories and measurement concepts define achievement motivation as a relatively delimited feature. SCHULER & PROSCHASKA include in their definition diverse connections and blurred boundaries to personality traits. (SCHULER & PROSCHASKA 2001: 5)

¹²⁰ For the sake of convenience explanations about achievement motivation of different theoretical approaches will be presented in an eclectic way and therefore cannot be allocated to a single theory. But the author mainly follows the traditional and for a long time dominant school of MURRAY/ MCCLELLAND/ ATKINSON/ HECKHAUSEN (cf. for example HECKHAUSEN 1989), i.e. their postulate of emotional conflict between approximation to success and avoidance of failure as driving forces for motivation as well as other parameters of their pool of motives.

standard. To excel one's self. To rival and surpass others. To increase self-regard by the successful exercise of talent." (MURRAY 1938: 164). These ambitions represent the motives behind individuals' tendencies of behavior towards striving situations that promise success or rather avoiding situations that imply failure.

ATKINSON (ATKINSON 1964) assumes that the intensity of aiming at success or avoiding failure is a stable personal disposition but it can also be determined as dependent on situations. In scientific community lots of motive dimensions of achievement motivation are listed, and depending on the respective theory focus is laid on certain facets of motivation. SCHULER & PROSCHASKA illustrate the various relevant facets or dimensions integrating different layers of achievement motivation from behavior tendency (rather situation-dependent) perspective as well as from personality traits perspective (rather situation-independent) (see figure 15).

Figure 15: Onion Skin Model of Achievement Motivation



Source: SCHULER & PROSCHASKA 2001: 9, own translation

Figure 15 illustrates a categorization of selected nuances which are relevant for achievement motivation. These nuanced motivation facets differ in their degree of impact on motivational force(s) depending on whether they belong to core facets or marginal facets. In practice, there are much more dimensions that are influencing the motivation of an individual. For now, we keep in mind that motivationally influencing variables are

numerous, overlapping, and that they can influence approximation or avoidance behavior in various ways.

With respect to the satisfaction of tasks there is a thumb rule of achievement motivation: the more difficult a task is the higher is the psychological distance to the goal and the higher is the probability of failure to achieve the goal, and the lower the motivational force, respectively. Yet, in practice a reverse relation between difficulty and prospect of success can also occur. This is the case when the expected success serves as incentive variable for further efforts because the expected pride about succeeding in a difficult task is very high weighted. In that case a high outcome weight offsets a high probability of failure. From this can be followed that to pride oneself on having successfully finished a task is all the higher the more difficult the task appears. The incentive for difficult tasks can therefore be strong, even if the probability of failure might be estimated as high.¹²¹ Analogically, a negative incentive for failure (= avoiding failure) will be strong the less difficult the task is; and, vice versa, the more difficult the task is, the lower is the displeasure about failure. (RUDOLPH 2009: 94ff.) Both cases generate motivational force but on the base of differing motives. While the first driving force is the prospect of success the second driving force is avoidance of failure.

On the base of these insights a mathematical derivation follows which can determine the resulted force of motivation ($f_s + f_f$) as a function of valence of success (G_s)/ valence of failure (G_f) and probability of success (P_s)/ probability of failure (P_f). (RUDOLPH 2009: 83ff.)

$$f_s + f_f = (G_s * P_s) - (G_f * P_f)$$

This function clarifies parameters of the selection of tasks. The majority of individuals chose the task with the highest resulted force. It should be taken into account that extremely difficult or extremely easy tasks provoke very low resulted forces since an extremely positive valence of difficult tasks is offset by a low weighting of the probability of success; the reverse is valid for extremely easy tasks where a low negative valence is offset by a high probability of success. Tasks of middle difficulty are therefore preferred by most individuals though individual differences in aspiration levels and dominant motive(s) evoke deviant behavior. (RUDOLPH 2009: 84ff.) Weighing tendencies of success or failure in a task are not only related to motives but they are also influential on different elements of action such as latency, intensity, and persistence.¹²² Especially if people are imagined as being

¹²¹ This behavior is assigned mainly to success-motivated individuals in contrast to failure-motivated individuals who do not get motivated through difficult tasks. (RUDOLPH 2009: 94ff.)

¹²² There are to be distinguished different determinants of action in motivational research. Through specific features of these elements of action motivation becomes apparent. Those respective elements are the choice of alternatives for action (or choice of tasks), latency (start and end of a specific action), intensity of an action, and persistence (duration of a specific action). (RUDOLPH 2009: 5)

categorized into success-motivated and failure-motivated characters this becomes clear in situations where f.i. persistence of working on a task is addressed. Success-motivated individuals are assumed to be notably persistent in accomplishing their task successfully if continuous failure occurs in tasks that are subjectively perceived as easy. On the other side, failure-motivated individuals are assumed to be notably persistent in accomplishing their task successfully if continuous failure occurs in tasks that are subjectively perceived as difficult. (RUDOLPH 2009: 103ff.) Consequently, the motivational force depends in a large part on the individual source of impetus.

Motivational psychology delivers promising albeit controversial concepts which refer to the individual source of impetus. So-called 'intrinsic' (internal) and 'extrinsic' (external) motivation are multi-layered concepts. Since the common perception of this distinction is very diverse¹²³ the author restricts the definition on a very general level. Intrinsic motivation occurs when a person acts for one's own accord, i.e. the reward for the maintenance of an activity arises from the activity itself which is experienced as exciting, interesting and challenging (WILDE et al. 2009: 32). In contrast, extrinsic motivation involves external control (RHEINBERG 2002: 152). For intrinsic motivation the crucial point is not the occasion but the subjective effective emotion(s) of being able to control the activities by oneself, i.e. the perceived autonomy during the activity. Hence, intrinsic motivation can also occur if the stimulus for action is of exogenous nature. Extrinsic motivation is often illustrated as the opposite pole of intrinsic motivation since it does not arise from the joy at activities but it is determined through the intention to achieve a specific result. (WILDE et al. 2009: 32f)

In practice, both motivation concepts are difficult to separate but the distinction is mentioned since it is important to keep in mind that motivation can be stimulated both from inside as well as from outside. Considering these facts the author assumes that intrinsic motivation - be it auto-stimulated or externally stimulated - is more effective and more sustainable than extrinsically imposed motivation. SCHULER & PROSCHASKA confirm this assumption and highlight a positive relation between achievement motivation and intrinsic motivation. For the authors, the importance of achievement motivation is the greater the less external coercion to concentrate one's own action on achievement as target value is exercised. In turn, this means that there is particularly large interest in enlightenment about poorly structured and on self-initiative as well as on voluntariness based fields of activity where achievement motivation turns out to be a rather divergent phenomenon, f.i. artistic performance, inventions, voluntary social commitment etc. (SCHULER & PROSCHASKA 2001: 7) Hence, with regard to voluntary commitment and self-initiative, intrinsic motivation plays an important role in the case study of this paper.

¹²³ Particularly the understanding of what is meant by 'intrinsic' varies considerably so that the term might cause rather confusion than adjustment; for scientific purpose it is therefore problematic. (RHEINBERG 2002: 155)

4.3 Achievement Motivation Inventory (AMI) (SCHULER & PROSCHASKA 2001)

Achievement motivation is used for the explanation of variances in individual behavior in a range of daily life since it refers to the behavioral driving force. Due to its wide range of occurrence and interrelation with many variables achievement motivation has undergone vast number of research in different spheres of life. Several attempts have been made to measure achievement motives, motivation and different facets. Yet, the development of measurement tools lags far behind theoretical findings¹²⁴, especially in terms of influence on individual motivation. This is probably due to difficulties in measuring achievement motivation and its correlation with personal competencies and other variables. (SCHULER & PROSCHASKA 2001: 5 and 7) With their so-called *Achievement Motivation Inventory* (AMI) SCHULER & PROSCHASKA offer an innovative¹²⁵ and a very broadband diagnostic procedure that covers all dimensions that are assumed to be a part of achievement motivation¹²⁶. The objective of the AMI-test was to develop a technique which serves both for research on personality psychology as well as for practical application: "The entire test shall rather be affectively applicable in all spheres of life where the pursuit for achievement comes alive and where its effect is observable." (SCHULER & PROSCHASKA 2001: 11, own translation).

The procedure of the process development of AMI included first of all a selection of a motivationally relevant pool of measurement items, and, secondly, the reduced derivation of 17 dimensions of work-related achievement motivation¹²⁷ which were each subdivided into a scale length of ten measurement items. By means of arithmetic mean, standard derivation, and discrimination coefficient the dimensions could be validly separated from each other. In the end form, AMI consists of 170 items to be responded by interviewees on a 7-point LIKERT format. After a scoring of the responses for every respondent an individual profile can be drawn up that gives insights into an individual's achievement motivation structure and allows for a precise and reliable evaluation of all major aspects of job-related achievement motivation. The formulation of measurement items was conducted in such a way that they consistently have work-related relevance but their validity is not restricted on the professional context (SCHULER & PROSCHASKA 2001: 11). Despite the focus on work-related motivation the openness of application in AMI offers a profitable base for the development

¹²⁴ Even achievement motivation as theoretical construct is not scientifically confirmed regarding its homogeneity or generalizability. (SCHULER & PROSCHASKA 2001: 7)

¹²⁵ In German-speaking area until 2001 there has not been developed a diagnostic procedure for a differentiated measurement of professional achievement motivation. (SCHULER & PROSCHASKA 2001: 5)

¹²⁶ The test responds to all significant variables, partial constructs or dimensions to which trait-oriented research on achievement motivation is addressed. (SCHULER & PROSCHASKA 2001: 11)

¹²⁷ The dimensions are compensatory effort, confidence in success, competitiveness, dominance, eagerness to learn, engagement, fearlessness, flexibility, flow, goal setting, independence, internality, persistence, preference for difficult tasks, pride in productivity, self-control and status orientation. (SCHULER & PROSCHASKA 2001: 23ff., own translation)

of a measuring instrument for motivation degrees in the context of the case study of this paper. Besides its practical and scientific orientation, AMI's synthesis of the available state of knowledge about achievement motivation is another reason for its selection as model for the quantitative investigations in the case study about the motivation for participation in *Participatory Technology Development* (PTD).

Summary Chapter 4

In this chapter initially two general elements of motivation have been outlined. On the one hand, motivation contains an action-oriented meaning that refers to the effects of motivational forces. On the other hand, motivation refers to motive(s) as source of impetus or driving force for action that is associated with the origin of motivational forces. It was illustrated that motivation depends on both situations and personal dispositions while it represents an intermediate step between personal/ environmental stimuli and behavior. Additionally, motivation works as accumulated force of the both sources of stimuli. At looking for a specification of motivational forces and its modes of operation it was outlined that motivation can be stimulated through unconscious driving forces as well as through processes of rational calculation and conscious decisions about goal-directed actions. With regard to motivation in social contexts it was referred to the accomplishment of tasks as a very elementary human desire or need which can cause innerpersonal tensions. In the pursuit of satisfaction of the desire/ need to accomplish the task such tensions are assumed to prompt individuals to initiate a behavior of approximation to success or of avoidance of failure based on a self-evaluation of competencies and weighing up between probabilities of failure and success concerning the achievement of a goal objective. This is supposed to stop the tension and to satisfy the need once the goal is achieved. During this process the degree of motivation depends strongly on individual value attribution to the goal object, the distance to the goal and the intensity of the perceived tension. Despite the detailed insights into the multilayered functions of motivational forces motivation remains difficult to assess due to very individual, intermediate and often intransparent cognitive processes.

For the purpose of the following case study of this paper, achievement motivation was deduced as the most suitable social motive to approximate motivation and proactive social participation. It plays a vital role that achievement motivation can be stimulated from outside without representing an extrinsic motivation stimulus.¹²⁸ More precisely, stimulating individuals' intrinsic motivation from outside can take place through responding to respective types of motivation personalities (f.i. success-motivated or failure-motivated);

¹²⁸ The author of this paper holds the opinion that the legitimacy of external stimulation depends on how this stimulation occurs and that the stimulation has to be performed with intense sensitivity for possible biases in goal setting conditions. External stimulation of internal motivation thus should take place under extreme socio-cultural and methodological sensibility.

through challenging but not overcharging or demanding too little from individuals since this might inhibit the emergence of motivational force; and through creating spaces where individuals can act for their own accord, where they have full control over activities and autonomy during the activity. *Conscientization* about the causes and the importance of needs or aspirations as well as identifying opportunities of how to respond to them is one way to indirectly stimulate intrinsic motivation. Participatory tools prove to be predestinated instruments to promote *conscientization*, action, and intrinsic motivation. Thus, the promotion of positive valence attribution to participatory tools and the benefit of experimentation appears very meaningful for the increase of motivational forces amongst farmers in the case study. Only such achievement motivation involves the capacity to solve problems independently and efficiently as it is intended in PTD.

Despite numerous research about motivation and achievement motivation there is a lack of measuring motivation. The *Achievement Motivation Inventory* (AMI) developed by SCHULER & PROSCHASKA in 2001 offers a broadbanded diagnostic procedure of measurement that was built on a new concept of how a wide variety of facets of achievement motivation are interrelated with each other (including for the first time relevant social motives). AMI will serve as model for the quantitative evaluation of motivation for participation in the case study, and it will contribute to the evaluation of participatory tools in the FiBL/ bioRe PTD-project in India where the case study was realized. The case study will now be addressed in the empirical part of this paper.

(III) EMPIRICAL PART

5. Case study

The present case study investigates the effects of participatory methods on motivation degrees of organic farmers during a *Participatory Technology Development* (PTD) process by means of participatory workshops regarding the development of innovative agricultural techniques in organic (cotton) farming. These workshops were realized by the author in 2010 in the context of a PTD-project in central India which is part of a long-term experiment about the comparison of farming systems conducted by the Swiss RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL).

Two aspects of participation stimulated the realization of an evaluation study about PTD-tools. First of all, there is a lack of evidence about whether participatory approaches live up to the promise of empowerment and social transformation to the benefit of marginal peoples (HICKEY & MOHAN 2004: 3). This aspect raises the question if participatory workshops and participatory tools have visible impacts and how such impacts can be measured. Moreover, the aim of this research is to seek for deeper insights into parameters of participation on *individual* level. In this context, a connection between motivational psychology and participation in development research has been established. As it became obvious in the previous chapters the object of study is complex since natural and social science elements are involved. Hence, the case study within the scope of a diploma thesis can only be conceptualized as an attempt to explore possible connections between motivational psychology and participatory PTD-tools for information gathering.

5.1 Case Study Approach

This case study is an intrinsic and mainly exploratory one. It is intrinsic because the researcher is a rather subjective and participating observer who has a personal interest in the study¹²⁹. Although the author always strived for a maximum of objectivity participatory processes and results are rather observed from an insider position. Further on, the case study is exploratory since research is conducted to gather and analyze elementary data that can be used for further investigations. Since there are also addressed causalities it can be partially considered as explanatory case study.

The complexity of the research topic required a mixed methods and multi-strategy design of the research process. Hence the following case study will also mix quantitative and qualitative data for the purpose of increased reliability¹³⁰, validity¹³¹ and generalization, i.e.

¹²⁹ The author's main objectives during the case study were to initiate a process of *conscientization*, i.e. of awareness rising of *all* people involved in the research process; to increase self-confidence of respondents (farmers); to improve the collaboration between researchers, farmers and agricultural extensionists; to increase mutual acknowledgement of knowledge systems as well as to facilitate a mutual learning process that might lead to social change in the broadest sense.

¹³⁰ Reliability of the results can only partly be strived for since reliability implies the replicability of results under similar conditions. Yet, participatory tools generally base on ad hoc decisions due to the peculiarities of local

the scaling-up of findings. Of course, the author takes into account limitations of the scaling-up of findings from a case study. This problem is countered by complementary triangulation of findings, and the maintenance of the chain of evidence. (cf. HARDWICK 2009: 441f; ROBSON 2011: 161ff.)

5.2 Research region

5.2.1 Physical environment

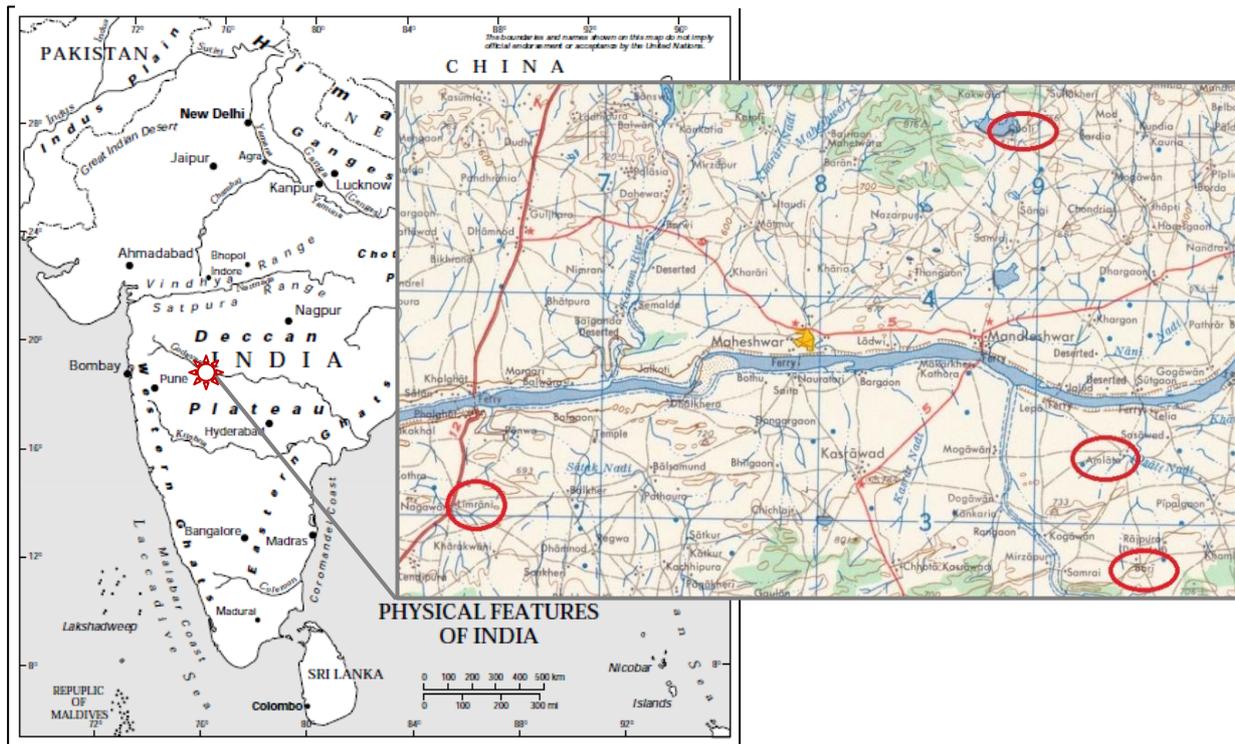
The research area encompasses four villages namely *Amlatha*, *Badi*, *Choli*, and *Nimrani* within a 10 - 15 km-radius linear distance around *Kasrawad*. *Kasrawad* is located 22°10' N and 75°40' E in the *Khargone* district (former name 'West Nimar', *Madhya Pradesh* State, West-central India). The region is situated in the *Nimar Valley* (200 - 500 m above sea level) that spreads southwestern of the *Narmada River Valley* which is bordered by the *Vindhya Range* to the North (Central Highland) and the *Satpura Range* to the South (*Deccan Plateau*). The regional climate is a semi-arid monsoon climate with an average annual precipitation of approximately 800 mm in one single peak monsoon season between June and September. The region is dominated by tropical dry forest and the seasonal temperature ranges from 15 - 49°C with the lowest temperatures in December - January and the highest in May - June. The length of the growing period in the region extends over a period of 120 - 150 days, and there are two main cropping seasons: the monsoon-season (*Kharif*) from June to October and the winter-season (*Rabi*) that lasts from November to March. (EYHORN 2006: 32; ICAR 1996; STANG 2002: 1ff.; GOVERNMENT OF MADHYA PRADESH 2009-10: 11; NAG 2001: 7ff.; CRIDA 2012)

Characteristic soils in the research area are medium (rd. 24%) to shallow (rd. 53%) black soils on elevations and slopes (inceptisols and entisols), and deep clayey black soils (vertisols) with medium to high available water capacity. Generally, the land capability in the referred region is limited. It is moderately suitable for cultivation at the riverbanks and partially suitable for grazing and forestry the more distant from the river (ICAR 1996; FiBL 2013a; NAG 2002: 200 and 221).

contexts. Hence, reliability in the context of the case study rather refers to the reliability of results *within* the case study for consistency and accuracy purposes.

¹³¹ Increased validity of the results of the case study is aimed at in order to ensure whether the obtained data actually serves for the depiction of the research question(s).

Figure 16: The villages *Amlatha, Badi, Choli, and Nimrani* in district *Khargone*



Source: UNITED NATIONS ORGANISATION 1992; US ARMY MAP SERVICE 1954

Due to the climatic conditions the Southwest of the *Narmada Valley* is vulnerable to droughts. Human practices such as deforestation for crop cultivation, excessive fuel-wood collection, shifting cultivation as well as slash and burn practice have contributed to soil erosion through sheet erosion that represents one of the major problems in the project region besides lowering of the ground-water table. Furthermore, the unbridled use of modern agricultural technologies such as chemical fertilizers, genetically modified seeds, and irrigation increased the pressure on local ecosystems and caused serious environmental degradation. (STANG 2002: 1ff; TIRTHA 2002: 54ff.)

5.2.2 Democratic culture

In many aspects India is a very diverse country. Often, specific aspects of diversity can be allocated to specific federal states or even to regions or districts. With respect to democracy issues in social life the allocation of a democratic culture to a small-scale geographic region appears difficult. Nevertheless, regional democratic culture is an important topic in the context of the case study about motivation for participation and thus it should be addressed. At doing so, democratic culture is approached by describing all India's democratic culture, and by looking on typical manifestations of democratic culture or democratic concepts according to social groups such as rural and urban population whereat the project region represents a rather rural poor region.

At large, India's democracy had flourished after the famous mass movement of resistance to British colonial rule and India's independence in 1947. After 65 years of independent rule, "Indian democracy is alive and - on the whole - well" (DRÈZE & SEN 2002: 376). "92% of the citizens of India consider that democracy is suitable for their country" (SETHI 2008: 3). In fact, in the international perspective India has a respectable democratic institutional structure in terms of elementary constituents of democratic practice such as equal voting rights. Universal adult suffrage was already adopted in 1935; much earlier than in other European countries. Furthermore, India's democratic culture has retained regular extensions and emendations such as the 73rd and the 74th constitutional amendments in 1993 that have consolidated the base for local democracy. (DRÈZE & SEN 2002: 349) As opposed to these advanced institutional democratic structures, there are also limitations of India's democracy that relate to public democratic practice such as public participation, public awareness, the vigor of opposition, distribution of power, etc.. In India, this democratic practice is mainly challenged by problems of diversity, poverty, inequality and human rights (SETHI 2008: 3ff.).

First of all, the religious and socio-economic diversity of India's population involves different democratic cultures and shows discrepancies in ideals and the target course of democracy. There are tendencies to attribute different objectives to democracy amongst a majority of non-elites and poor. The poor attribute to democracy rather the capacity to provide for basic necessities and the existence of equal rights; in contrast to elites who also stress power to change governments as a main attribute to (political) democracy. Since the majority of Indian citizens can be designated to rather poor population groups¹³² it seems natural that democracy as a form of government and as power to change generally appears to occupy a secondary meaning in India. As a matter of fact, the idea to *appropriate* democracy as a power to change varies across population groups according to their social status. A study that was conducted in 2007 by the *State of democracy in South Asia*-project (SDSA) and the CENTRE FOR THE STUDY OF DEVELOPING SOCIETIES (CSDS) gives examples for spaces of engagement as well as for variations in social and/ or political participation. According to the study, 11% of respondents in India reported being members of a trade union (this number is probably even less extensive amongst poor population groups). The average European proportion of employees in trade unions accounts for 24% (ranging from 74% in Finland to 8% in France) (EUROPEAN TRADE UNION INSTITUTE - ETUI 2013). The participation of Indian citizens in protests, demonstrations, struggles or related activities accounts for 15% (compared to 19% in South Asia). Only 6% of Indian respondents declare participating in NGOs, while 16% participate in women's organizations. The survey also discloses that besides democratic social or political movements popular movements based on religious issues appear to be significant spheres of individual engagement for participation: a whole

¹³² 75.6% of the Indian population lives below the international poverty line of \$ 2.00 a day and 41.6% lives below the international poverty line of having less than \$ 1.25 a day. (WORLD BANK 2011: 394)

24% of the population in India participates in a religious movement; this is the same proportion of employees' average engagement in trade unions in Europe. (SETHI 2008: 3ff.)

5.2.3 Social environment

In the following, the perspective will be stepwise narrowed from national to district level since social indicators of the research area are more convincing once they are compared to all Indian indicators. Additionally, getting a rough idea about selected social indicators of all India is helpful for understanding specific contradictions and problems that are characteristic for the country. In addition, these contradictions determine manifestations of motivation for participation.

Besides the above addressed diversity of democratic culture and attitudes India involves several consolidated structural socio-economic and regional inequalities with regard to an uneven distribution of opportunities, unequal power structures, disparities in income distribution, and gender inequalities especially between rural and urban areas. India's caste system is also assumed to have influences on forms and degrees of participation since it delimitates vertical and horizontal interaction or engagement and affects the scope of social privileges such as political participation or exercise of democratic power¹³³. Those distributive inequalities denote one of the major challenges for public participation and sustainable development in India.

India's GNI per capita almost tripled within the last three decades. The latest UNITED NATIONS HUMAN DEVELOPMENT REPORT (UN-HDR 2011) discloses that between 1980 and 2011, India's HDI value increased from 0.344 to 0.547. This is an increase of 59% so that India has been positioned in the 'medium human development category'. Life expectancy at birth has increased by 10.1% a year over the last two decades, and mean years of schooling increased by 2.5 years from 1.9 mean years of schooling in 1980 to 4.4 mean years of schooling in 2011. Despite the economic growth and progress in other categories India recently ranks a low 134 among 187 in HUMAN DEVELOPMENT INDEX (HDI)¹³⁴. In 2011, India's HDI is below the average of 0.630 for countries in the medium human development group and below the average of 0.548 for countries in South Asia. Furthermore, India has a GENDER INEQUALITY INDEX (GII)¹³⁵ value of 0.617, ranking it 129 out of 146 countries, and once again below South Asia's average of 0.601. With this value, India supersedes the GII of low-income countries such as Bangladesh (0.550) and Pakistan (0.573). The MULTIDIMENSIONAL POVERTY INDEX (MPI)¹³⁶ reveals

¹³³ The derivation of correlations between caste system and socio-political participation is debatable. Furthermore, in the past, India's special form of society surely had to serve many times as a proof for social problems. For this reason the caste systems' possible influences will not be explicitly considered but they are implicitly included in considerations about religious and socio-economic diversity.

¹³⁴ HDI assesses long-term progress in health, education and income indicators. (UNDP 2011: 168)

¹³⁵ GII reflects gender-based disadvantage in three dimensions: reproductive health, empowerment and the labor market. (UNDP 2011: 171)

¹³⁶ MPI identifies multiple deprivations at the individual level in education, health and standard of living. (UNDP 2011: 172)

that India also ranks not far from Bangladesh (MPI India (2005/ 06): 0.283 vs. MPI Bangladesh (2007): 0.292). The proportion of population in severe poverty in India is even higher than in Bangladesh (28.6% vs. 26.2%), and the percentage of population below the income poverty line of \$1.25 a day in both countries is similar (India: 41.6% vs. Bangladesh: 49.6%). (UNDP 2011: 144; DRÈZE & SEN 2002: 375f; SETHI 2008: 2ff.) Obviously, India still is "deeply compromised by the tension [between a certain political equality on the one side and socio-economic inequality on the other side; author's note]" (DRÈZE & SEN 2002: 376).

Social and economic inequalities are closely linked to the democratic practice of individuals since inequalities can be reinforced through powerful interest groups or inequalities of opportunities for participation can even undermine democracy and inhibit political equality (DRÈZE & SEN 2002: 376). This resulting reciprocity is highly relevant in Indian society where inequalities are also structurally conditioned by Indian tradition, i.e. the still predominantly rigid and impermeable caste system, as well as by an "inadequate use of functional democratic institutions on the part of the concerned persons or groups, often due to limited understanding or skill, and sometimes even limited motivation, given the tradition of unquestioning acceptance" (DRÈZE & SEN 2002: 352).

When assessing inequalities of opportunity, basic education is of great importance since it is a significant determinant of individuals' income, health and capacity to interact with others or for public action (WORLD BANK 2005: 34). Furthermore, democratic practice stands and falls directly by formal educational levels and media exposure that influence individual levels of social articulation. According to the NATIONAL FAMILY HEALTH SURVEY (NFHS-3), in 2005/ 06 a large proportion of India's population has little or no education with a much higher proportion for females than for males (see table 5).

Table 5: Levels of education in India in 2005/ 06 (NFHS-3) (Educational attainment of household population, % distribution)¹³⁷

Background characteristics	No education	< 5 years complete	Median # of years schooling completed	No education	< 5 years complete	Median # of years schooling completed
	Female			Male		
Urban	25.3	15.5	5.5	12.5	15.9	7.6
Rural	48.6	19.3	0.0	26.5	23.4	4.0
Total	41.5	18.1	1.9	21.9	20.9	4.9
Total NFHS-2 (1998-99)	44.4	20.9	0.6	21.7	24.3	4.5
Total NFHS-1 (1992-93)	54.7	14.6	0.0	29.2	19.3	4.0

Source: ZAHUMENSKY 2013, adapted from NATIONAL FAMILY HEALTH SURVEY (NFHS-3) 2005/ 06: 28

Among the population aged six and over 21.9% of males and rd. 41.5% of females have never attended school, and 20.9% of males and 18.1% of females have less than five years of completed education. The median number of completed years of schooling for women age six years and more is rd. two years (for men rd. five years). Similar trends apply to the relation between rural and urban areas. Almost half of the rural female population aged six and over have never attended school while the percentage of no education among females with urban residence is rd. 25%. Total rural non-education of males accounts for 26.5% in contrast to 12.5% of males with urban residence who never attended school. Main reasons for not attending school are low interest in studies, high costs, outside work for payment in cash (males), household work (females), repeated failure, work on the family farm or in family business (males), and marriage (females). (NATIONAL FAMILY HEALTH SURVEY (NFHS-3) 2005/ 06: 28ff.)

A comparison of data on education with former NFHS-Surveys in 1992/ 93 and 1998/ 99 show rather slow rates of change for the national population. Correspondingly, despite that the literacy rate in India increased by 9.21% since 2001, currently the total literacy rate accounts only for rd. 74% (2011). The gap of rd. 22% (2001) between male and female literacy rates could be reduced to rd. 12% in 2011. The rural total literate rate accounts for 68.9% in 2011 (urban literacy rate: 85%) and, hence, continues lacking behind the national average. (GOVERNMENT OF INDIA 2011a) The following table illustrates regional disparities and gender inequalities of literacy rates on different scales (see table 6).

¹³⁷ The following percentage shares refer to the respective population groups (total population, rural total, urban total, rural or urban female, or rural or urban male population). Due to the varying reference values (= varying population sizes) the percentage shares do not result in 100%. This applies to percentage shares of table 6, too.

Table 6: Proportions of literacy rates in nation state, federal state and district 2011 (in %)

Literacy rate in % of national, federal state or district population (rounded)	India			<i>Madhya Pradesh</i> (M. P.)			<i>Khargone</i> (<i>West Nimar</i>)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Urban	89.7	79.9	85	90.2	77.4	84.1	89.5	76.3	83
Rural	78.6	58.8	68.9	76.6	53.2	65.3	70.8	49.3	60.2
Total	82.1	65.5	74	80.5	60	70.6	74	53.7	64

Source: ZAHUMENSKY 2013, adapted from GOVERNMENT OF INDIA 2011b: 33ff.; GOVERNMENT OF INDIA 2011c; GOVERNMENT OF INDIA 2011d

As table 6 shows the proportions generally record adverse proportions for females and a decline in literacy rates the more rural the area. *Madhya Pradesh* state is the second largest and the sixth most populous state of India (6% of India's total population) with a higher growth rate than the average of all India (India's total population has increased by 408% between 1901 and 2011; the population of *Madhya Pradesh* increased by 473% within the same time frame). During the last 10 years, the urban population has increased by 25.6% with the result that out of the total population of *Madhya Pradesh* state 27.6% people live in urban regions. The other 72.4% live in the villages of rural areas. The average literacy rate in rural areas of *Madhya Pradesh* accounts for 65.3% and in urban areas for 84.1% (GOVERNMENT OF INDIA 2011c). The literacy rate for males and females in rural areas stood at 76.6% and 53.2%. Independently from residence, 80.5% of males in *Madhya Pradesh* are literate while only 60% of female population is literate. The gap of the median number of years schooling completed between females and males aged six and over with no education ranges from 0.1 (females) to 4.3 (males). (NATIONAL FAMILY HEALTH SURVEY (NFHS-3) 2005/ 06: 30) With a total literacy proportion of 70.6% *Madhya Pradesh* lies below the national average and ranks at the rather low-middle literate states (GOVERNMENT OF INDIA 2011e: 131).

About 2.6% of *Madhya Pradesh's* population lives in district *Khargone*, that means that out of 100 persons of *Madhya Pradesh* three are from the *Khargone* district (GOVERNMENT OF INDIA 2011f: 46). In the district about two third of the male and only slightly more than half of the female population is literate, the average low literacy rate in this district accounts for 64% in 2011 (10 percentage points below India's average) (GOVERNMENT OF INDIA 2011g: 183). Out of the total *Khargone* population for 2011 census, 84% lives in rural regions or villages of the district. Literacy rates of males and females with rural residence stick out since they are significantly lower than national or federal state averages. The female rural literacy rate in *Khargone* ranks almost 10 percentage points below India's

average in rural areas. The rural male literacy rate does not perform much better and ranks almost 8 percentage points below India's average. (GOVERNMENT OF INDIA 2011d)

Summarized, disadvantageous rural-urban as well as female-male ratios increase from national to district scale. The most significant discrepancy of literacy ratios is the negative average rural-urban ratio of *Khargone* district where the rural average literacy rate ranks 22.8 percentage points below the average urban literacy rate in the district.

Besides formal education parameters there are other general indicators which characterize the socio-economic structure and modest facilities of the project region (*Khargone* district). The majority of buildings in the area are made of mud and burnt or unburnt brick with a roof of handmade tiles, GI (corrugated Galvanized Iron) sheets, metal or asbestos sheets. Usually they have one or two rooms; only 10% of the households have more than two rooms available for a usual household size of 6-8 members which account for 30% of households in *Khargone*. Cooking takes place inside the house although more than half of households in *Khargone* do not have a kitchen but open-fire stoves on the floor (57.4%). The women primarily use firewood, crop residues and LPG (Liquefied Petroleum Gas) for cooking. A peculiarity of the project area is that there is a relatively elevated value of the use of biogas for cooking (1.3% for *Khargone* district in comparison to an average of 0.3% in *Madhya Pradesh* state). (GOVERNMENT OF INDIA 2010-11)

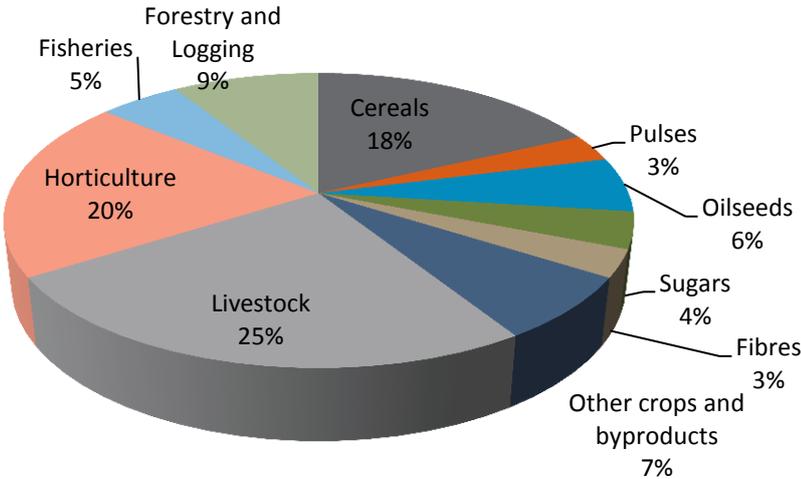
Despite a good average access to a power supply system for lighting (83% of *Khargone*'s households have electricity as source of lighting) drinking water facilities are limited. Only approximately half of the households in *Khargone* have tap water available from treated as well as untreated sources. For 12% of the households drinking water is only available from un-covered wells where people have to draw the water per hand pump. At least, a majority of households has its drinking water source available within the premises (30.1%) or near the premises (45.3%). For about one quarter of the households the drinking water source is away. A very peculiar but typical circumstance for *Khargone* and all rural India is the type of latrine facility. Less than one quarter of the households has a latrine facility available within the premises (22.4%, mainly flash latrine connected to a septic tank). Almost the rest (76.3%) uses open latrines (no public latrines) outside the premises since many households do not have bathing facilities at all (43.4%), and do not have any drainage (46.6%). (GOVERNMENT OF INDIA 2010-11)

Summarized, the project region is featured by predominantly plain living conditions, insufficient formal education and public infrastructure, strong traditional family structures, and a strong religious sentiment. From own experience one can state that local people are very hospitable, curious and open minded for foreigners, and content with the scarce resources they dispose. Due to the elementary life style, residents of the research area basically define democratic practice as a means for the satisfaction of basic needs since those are the most urgent topics of daily life of the majority.

5.2.4 Agricultural patterns

Given that India is still the country with the largest number of poor and malnourished people in the world agriculture is a critical sector in Indian economy. About 60% of India's land area is agricultural land (WORLD BANK 2013b); employment in agriculture accounts for 51% (2010) of total national employment (WORLD BANK 2013c), and despite a boom of urban population India's rural population raised by 58% between 1980-2011 (WORLD BANK 2013d). The proportion of rural population accounts for about 68.8% of the total population (2001: 72.2%) (GOVERNMENT OF INDIA 2011h: 8). Although agriculture's contribution to the Gross Domestic Product (GDP) has steadily decreased from about 30% in 1990-91 to 13.9% in 2011-12 primary sector is a mainstay of national economy and an important employment sector, as well as a source of livelihood and food security for a vast number of low income sections of the population (GOVERNMENT OF INDIA 2011-12: 3). Major crops are wheat, maize, rice, pulses, soybean, oilseeds, sugarcane and cotton which together constitute a proportion of 41% of the output from agriculture and allied sectors (see figure 17).

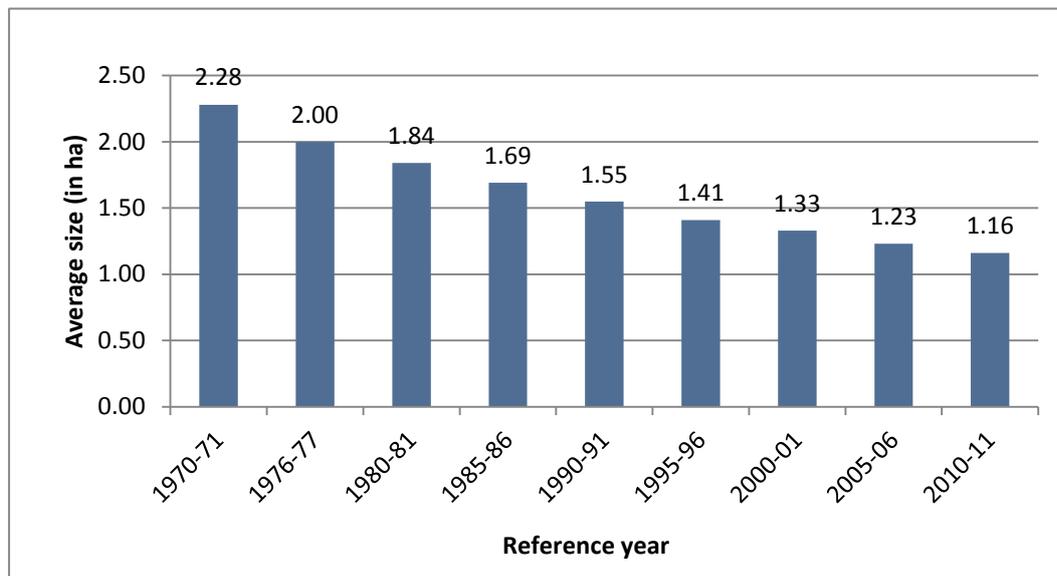
Figure 17: Output of agriculture and allied sectors 2009-10 (in %)



Source: GOVERNMENT OF INDIA 2011-12: 9

Indian agriculture has undergone significant structural transformations during the last decades. Besides the shift from a traditional agrarian economy towards a service dominated economy the structure of holdings has also changed. As figure 18 illustrates the average size of holdings has diminished steadily from an average holding size of 2.28 ha in 1970-71 to 1.16 ha in 2010-11.

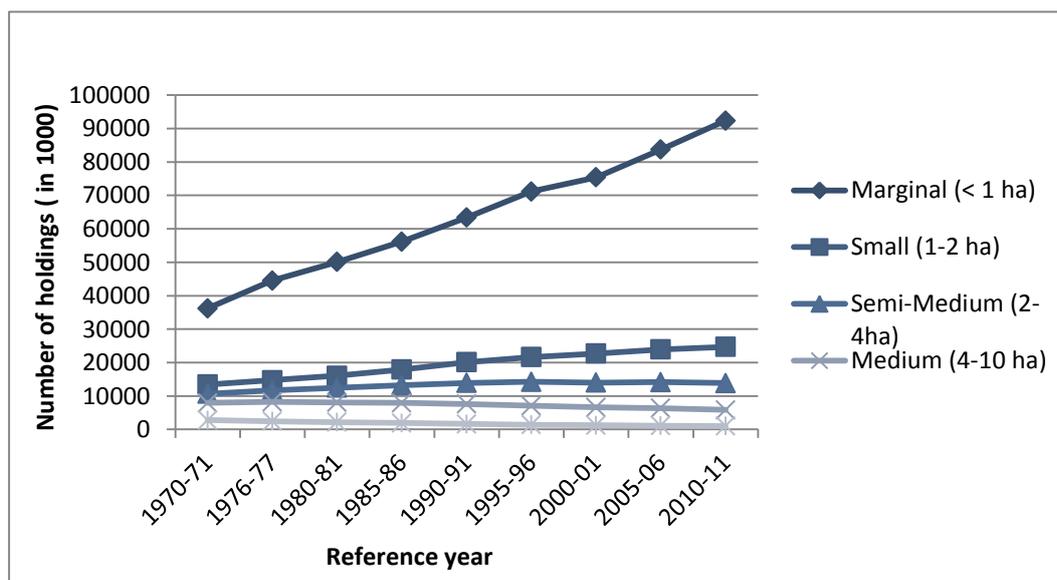
Figure 18: Average size of holdings as per different Agriculture Censuses 1970-2011



Source: GOVERNMENT OF INDIA 2012: 11

This trend arises from population increase in combination with continued divided inheritance of land. As per AGRICULTURE CENSUS 2010-11, the proportion of small and marginal holdings taken together (below 2.00 ha) constitutes 85% of total holdings. Since the 1970s the number of this category of holdings increased by 155% and indicates an increasing fragmentation of land holdings (see figure 19). Thus, the availability of cultivable land area per household decreases whereas the pressure of population on agricultural land increases.

Figure 19: Number of holdings as per different Agriculture Censuses 1970-2011



Source: ZAHUMENSKY 2013, adapted from GOVERNMENT OF INDIA 2012: 9

The political and economic answer to this trend were measures to increase agricultural productivity such as the introduction of high yielding varieties as in the case of Bt cotton¹³⁸ in 2002 and hybrid maize in 2007, intensified input use, the availability of quality seeds and improved farming techniques (GOVERNMENT OF INDIA 2011-12: 7f). Currently, the attention to organic farming as alternative cultivation method is increasing. India's recognition of organic agriculture for development and organic market potential emerged since the 2000s. With a percental share of 0.6% of total agricultural land in 2011 the area of organic agricultural land raised twentyfold since 2002 (0.03%) (FiBL & IFOAM 2013: 319; FiBL & IFOAM 2004: 16). Aside from its low share of organic agricultural land India is currently world wide leading in the number of organic producers. In 2013, the 547 591 organic producers in India represent about one third of the world's organic producers (FiBL & IFOAM 2013: 319).

Madhya Pradesh state is one of the primarily agricultural states. Agriculture and allied services contribute about 44% share in M. P. state's economy and 78% of its working force is directly engaged in agriculture. *Madhya Pradesh's* population as well as the population of *Khargone* district is depending mainly on agriculture since the majority of the total population lives in the villages of rural areas. (GOVERNMENT OF MADHYA PRADESH 2004a; NAG 2001: 51; GOVERNMENT OF INDIA 2011c)

As illustrated in table 7, since 2001, *Madhya Pradesh* state is the leading national producer of soybean, gram, oilseeds, and pulses, as well as it represents an important cotton producer. Conventional cotton farming usually involves the cultivation of short duration Bt cotton varieties. A typical regional cropping sequence is a crop rotation of cotton, chili, soybean and sorghum in *Kharif* season as well as wheat and chickpea in *Rabi* season. Yet, there is also grown maize, mung bean, pigeon pea and onions, as well as there is horticulture (CRIDA 2012).

Table 7: *Madhya Pradesh's* (M. P.) share in national agricultural production 2002/ 2010

Crop	% of shared production in proportion to all India		M. P.'s rank amongst all Indian states 2009/10 (2001/2)
	2001-2002	2009-2010	
Soybean	61.9	64.3	1 (1)
Gram	41.8	44.2	1 (1)
Oilseeds	21.4	30.7	1 (1)
Pulses	22.9	29.4	1 (1)
Cotton	3.9	3.6	8 (7)

Source: ZAHUMENSKY 2013, adapted from GOVERNMENT OF INDIA 2011i; GOVERNMENT OF MADHYA PRADESH 2004b

¹³⁸ Bt-cotton is genetically modified cotton. Genes of the soil bacterium *Bacillus thuringiensis* which improves the crop's self-defense against pests is transmitted to the plant.

In India, cotton has been the fastest-growing crop in growth rates of production during the last decade. Between 2001 and 2011 the growth rate of production of cotton (13.8% per annum) superseded the growth rates of production of any other crop. In 2010-11, *Madhya Pradesh's* share of production in proportion to all India already amounts for 6% ranking *Madhya Pradesh* as cotton producer on place six among all Indian states. (GOVERNMENT OF INDIA 2011i)

Cotton is also a very common commercial crop in *Khargone* district because it is relatively drought-resistant. The research region is regularly prone to moderate heat waves between May and June, and, sporadically it is moderately prone to droughts. Thus, cotton is even a very important regional crop as irrigation in *Khargone* district is predominantly rainfed. Moreover, due to its deep root growth cotton is able to reach deep water reservoirs of soils. During dry season, especially cotton, chili and wheat have to be irrigated partially or entirely (e.g. wheat). To the contrast, sporadically, the research region is also moderately prone to heavy rainfalls between August and September. Another advantage of cotton cultivation is that cotton can also tolerate excessive humidity. In addition, the regional prevalent clay-rich and thus retentive vertisols, so-called *black cotton soils*, are ideal for cotton cultivation. As a result, cotton is the crop with the highest specific land use in the research region. About 52% of the cultivable land of *Khargone* district is occupied by cotton.

Since vertisols generally have low phosphate, nitrogen and organic matter contents there is also a widespread use of synthetical fertilizers such as N-P-K compounds, urea, di-ammonium phosphate (DAP) or muriate of potash (MOP) in the research area. Severe sucking pests, bollworm pests and crop diseases occur periodically mainly due to the heat waves or due to heavy or unseasonal rains. They are usually coped with insecticide or fungicide spray. (CRIDA 2012) Besides, organic techniques such as green manuring, mulching, application of cow urine or cow dung, composting and intercultural operations are practiced for increasing soil fertility and for pest defense. Recently, the cropping intensity of *Khargone* district could be increased by these means so that it accounts for 131.8%. That means that the net cropped area is being cultivated more than once during one agricultural year. (NAG 2001: 31; CRIDA 2012)

Given the significance of agriculture, the dominance of the rural population and the continued multifaceted deficiencies in Indian villages (poverty, malnutrition, poor standards of public health and infrastructure, illiteracy, etc.) the economy of India included special attention to agrarian sector and rural development in its economic budgeting planning, the so called *Five-Year Plans* (FYPs), almost from the beginning of the republic. Already during the first *Five-Year Plan* of 1951-56 community development became an integral part of the plan and ambitious community development prospects were launched. Increasing agricultural production, improvements of rural health and hygiene, investments in rural communications systems, and in rural education have been mainly intended besides the initiation of processes of continuous social, economic and cultural change in communities that

on the one hand aimed for transforming social and political life in the villages and on the other hand on integrating "communities into the life of the nation, and to enable them to contribute to national progress" (DURGADAS 2010: 19). A special and unique characteristic of the community development program was the functioning of democracy as a prerequisite of the program's success and the call for popular participation at different levels. (DURGADAS 2010: 16ff.)

After 60 years of *Five-Year Plans*, and various course corrections one has to admit that community development or integrated rural development efforts failed in India since they had and still have difficulties in meeting the needs of (poorer) communities and in enabling them in exercising the necessary powers. Villagers remained passive recipients with the result that a variety of activities made little impact on the core problems. The shift of development focus on the increase of agricultural productivity during the food crisis in the 1960s, a decelerated prioritization between small or marginal farmers on the one side and agricultural laborers or women as target groups on the other side, little publicity of programs, and low rates of people's participation were shortcomings for a sustainable rural development in India. (DURGADAS 2010: 24ff.) Key challenges that all India is still facing are improving agricultural productivity in the face of climate change, enhancing input use, and ensuring efficiency of nutrients, water and land use (GOVERNMENT OF INDIA 2011-12: 145).

Against this backdrop of diverse challenges attention to agricultural research and development (R&D), education and extension remains critical in India. Therefore a science-led path was adopted by the INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR) that advocates greater investments in R&D efforts for the purpose of productivity growth, attainment of self-sufficiency and exports, as well as for increasing use efficiency of natural resources. There is empirical evidence that technology generation such as hybrid maize and Bt cotton, and their dissemination through the public extension system have been the main drivers for rapid agricultural transformation in India that is not apparent only in the crop sector but also in allied sectors. It is worth mentioning that the private sector significantly contributed to agricultural transformations and that public-private sector partnerships are common in agricultural R&D: "Technology would be the prime mover of agriculture growth in future and it is observed that the private sector particularly, the multinationals have invested heavily in R&D" (GOVERNMENT OF INDIA 2011-12: 143). With respect to the enhancement of nutrient use efficiency more research attention is given to conservation agriculture, research on soil fertility (enhancing nutrients acquisition and availability, fertilizer recommendations tailored to the farmers' resources availability), water use efficiency, and integrated farming systems (combination of trees, crops and livestock for risk reduction especially of small resource-poor farmers). (GOVERNMENT OF INDIA 2011-12: 145f)

In the project region the SWISS RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL) and the organic cotton producer company bioRe India Limited (bioRe) are jointly conducting a research project for long-term farming systems comparison and technology development.

Thereby, organic farming systems are surveyed as alternative to conventional farming systems and as a form of sustainable agriculture since the principles of organic agriculture are based on the efficient use of locally available resources and adapted technologies which can better address the problems of local production systems.

5.3 FiBL/ bioRe research in India

Already in 1978, FiBL started a still running *Long-Term Farming Systems Comparison Experiment* (LTE) in Switzerland comparing organic and conventional farming in order to survey potentials and advantages of organic farming in terms of resource efficiency, ecosystem functioning and soil fertility conservation, while maintaining a high production level. Results of the experiment suggest the assumption that organic agriculture could be a promising option for sustainable agricultural intensification in other countries, especially in the global South (cf. MÄDER et al. 2002).

Since 2005, similar research projects in form of long-term field trials for the comparison of farming systems were started by FiBL, its financing partners¹³⁹, as well as together with FiBL's local partners¹⁴⁰ in developing tropical countries in three different climate zones, i.e. in Kenya (since 2005), in India (since 2006) and in Bolivia (since 2008). FiBL's aim is to establish a network of farming systems comparison field trials, to gather solid scientific agronomic and socio-economic data on the performance of agriculture production systems on the one hand, and on-farm research, awareness creating, and political debates about risks and benefits of organic farming in developing tropical countries on the other hand. Enhanced know-how about different agricultural production systems and their potential contribution to sustainable agriculture is intended to be reached by accomplishing not only data collection through the LTE but also through the development and dissemination of new locally adapted agricultural technologies for major organic production systems. The latter was implemented through *Participatory Technology Development* (PTD) as one keystone of FiBL's *Farming Systems Comparison in the Tropics*. (FiBL 2011a; FiBL 2011b)

FiBL's main research cooperation partner and local project implementer in the Indian LTE project is bioRe India Association which has engaged a research team on joint activities with FiBL in the field of LTE field trials. BioRe Association was set up in 2003 as a farmers' association with the vision to empower organic and biodynamic farmers and

¹³⁹ Donors of the *Long-term Farming Systems Comparison* experiment are BIOVISION FOUNDATION, the SWISS AGENCY FOR DEVELOPMENT AND COOPERATION, the LIECHTENSTEIN DEVELOPMENT SERVICE, and the COOP SUSTAINABILITY FUND.

¹⁴⁰ FiBL established networks of main and associated partners at the local level (i.e. in the country of each project site) as local steering committees. These committees make strategic decisions, conceive the various project parts, decide on and plan activities, monitor project progress, and develop a common communication strategy at the local level. (FiBL 2013b)

communities by facilitating education and promoting infrastructure, and by addressing local needs that lead to a holistic and sustainable development. The association is linked to the organic cotton trade company bioRe India Ltd. which was founded in 1991 with the base in *Kasrawad, Khargone* district, state of *Madhya Pradesh*. BioRe India Ltd.'s objective is to improve small farmers' livelihoods through certified organic cotton trading whereby farmers are treated as partners. BioRe Ltd. gives agricultural advice, extension and support for the purchase of organic means of production. Furthermore, the company delivers organic cotton to the Swiss eco-textiles trading company REMEI AG. Under the registered trademark bioRe® REMEI AG produces organic cotton threads/ yarns and textiles/ clothing. The bioRe® quality label represents REMEI AG's socially and ecologically compatible chain of production in which organic cotton is processed into fashion items for brand manufacturers and trading companies. REMEI AG's corporate objective is sustainable development and corporate management focusing on principles such as product ecology (certified organic cotton farming), fairness and social compatibility throughout the whole production chain, allowing for innovations such as carbon-neutral cotton production and/ or compensation through biogas plants at the manufacturing base, quality control of products and an internal management control system, as well as transparency and traceability of bioRe® products.

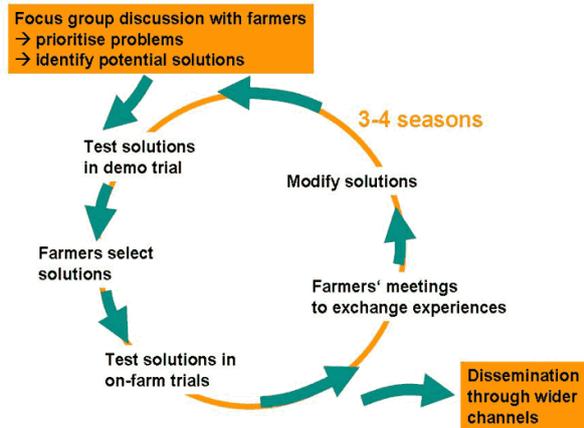
Despite of recently massive declines in the production of organic cotton REMEI AG could record an annual turnover of 16 Mio. Euros and produced altogether 3337 Mio. tons of organic cotton (lint) in the business year 2011/ 2012. The contribution of cotton production of the two production sites Tanzania and India are similar (Tanzania: 1840 t lint vs. India 1537 t lint) while the registered farmers participating in bioRe's organic cotton production is almost the double in India (Tanzania registered bioRe farmers: 2808 vs. India registered bioRe farmers: 5533). Altogether, in 2011-2012, REMEI AG could integrate 8341 Indian and Tanzanian organic cotton farmers in its production cycle and in this way provided an alternative and sustainable agricultural perspective to many local small-scale farmers. (REMEI AG 2012: 10f; bioRe INDIA LTD. 2012; bioRe ASSOCIATION 2013a)

5.3.1 The FiBL/ bioRe PTD-project in India

Specifically, the FiBL/ bioRe research project in India intends to observe and compare four different farming systems in cotton, wheat and soybean cultivation. Farming practices are compared under biodynamic, organic, and conventional conditions as well as the performance of genetically modified organisms (GMO) is compared. The main intention is to gather information on performance and potential of the organic production system while testing different soil treatments for improvements in production and sustainability of the farming practice. The various research activities that are carried out by FiBL and bioRe are on-station LTE-trials, on-farm validation trials and participatory development of agricultural technologies (PTD) that take place on famers' fields (on-farm). (bioRe ASSOCIATION

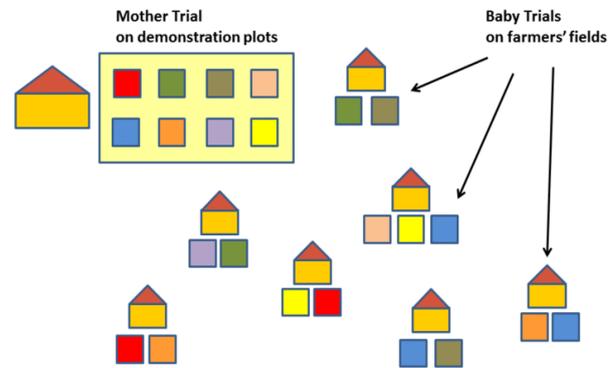
2013b) The PTD component in the research project follows the innovation cycle approach and uses the mother-baby trial design as experimental basis (see figures 20 and 21).

Figure 20: Innovation cycle



Source: FiBL 2013c

Figure 21: Mother-baby trial



Source: FiBL 2013c

The participatory research element was introduced in 2009 additionally to FiBL's non-participative on-station research line. The purpose of the participatory on-farm research process is to disclose local *Indigenous Technological Knowledge* (ITK), to train farmers' observation skills and experimental spirit as well as to stimulate early and active participation of the registered bioRe organic farmers in the overall LTE-research process, in project planning, implementation and evaluation. BioRe farmers' active participation is considered as both as a condition as well as goal for a sustainable *Participatory Action Research* (P(A)R).

In 2010, PTD-activities in the research area took place in form of (i) evaluation of phosphate rock as an additional source of phosphorus for the organic cotton - soya - wheat crop rotation and (ii) as probing of the possible introduction of nitrogen fixing crops (e.g. *Sesbania*, *Crotalaria*, *Gliricidia*) into the local farming system. For this purpose, an on-station mother trial was set up close to the bioRe Association area in a way that allows visiting farmers to validate crop performances under different treatments (see annex 1 for treatment details in the phosphate rock experiment of 2010). Either phosphate rock or phosphate rock in combination with other organic fertilizers (compost) and/ or ingredients such as *Phosphorous Solubilizing Bacteria* (PSB) and/ or tamarind solution were applied to cotton, soybean and wheat. The treatments have been suggested by the research team and/ or by farmers themselves as in the case of acid tamarind solution that was assumed to facilitate the solution of phosphorous deposits in local soils. The participatory component included that farmers participated in similar small-scale on-farm baby trials, where they observed a treatment of choice under their own field conditions. Additionally, farmer exchange visits provided an insight into the neighbor's fields and the exchange of

experiences. At the end of each cropping season, farmers gathered information as well as experiences were discussed with others in participatory workshops. The same mother-baby procedure is intended to be accomplished regarding the plantation of nitrogen fixing plants or green manure for intercropping or alley cropping experiments. (FiBL 2013d)

5.4 Research questions, methodology and hypotheses of the case study

Under FiBL's instruction the author of this paper conducted a field study in the form of an action research in the bioRe training center in *Kasrawad* and in four nearby villages from 15th May 2010 to 30th October 2010. The participation of farmers in FiBL's PTD-experiment to that date was at the very beginning. Farmers were functionally participating in the PTD-project, but their active contribution in form of delivering 'innovative ideas' was in need of improvement as well as the dialog between researchers and farmers was considered as having to be improved.

The overarching research question of the case study refers to the impact of the FiBL/ bioRe PTD-project on product level and even more on process level: a distinct evaluation emphasis is laid on observations about participatory processes. More precisely, two questions were intended to be answered in the first instance:

- 1. How can bioRe organic farmers be motivated to participate in the PTD-project? (Which methods are most suitable?)**
- 2. How can bioRe organic farmers' ideas be integrated more systematically into the research process of the *Long-Term Experiment*?**

In the first instance, the field study encompasses intense capacity building, i.e. the communication of participatory tools and philosophy, as well as training in their application within the bioRe research team in order to create a base for further participatory practice on local level. Secondly, the author conducts a standardized survey about the motivation degree of farmers who are participating in the PTD-on-farm research line. Finally, the author realizes PTD-workshops and carries out a participatory evaluation of applied participatory PTD-tools during the workshops. Furthermore, semi-structured expert interviews serve for the discussion of results against the backdrop of post-development criticism. With regard to participatory tools and farmers' motivation for participation two aspects can be hypothesized:

Hypothesis 1

The PTD-tools which were used during the PTD-workshops affect farmers' basic motivation and motivation for participation in the FiBL/ bioRe participatory research about

farming systems comparison. The selected PTD-tools at least influence the degree of motivation or affect farmers' attitudes or their willingness to get pro-active.

Hypothesis 2

The degree of farmers' motivation for participation is measurable via achievement motivation. The psychological test inventory *Achievement Motivation Inventory* (AMI) from SCHULER et al. (2002) serves as a basis for a standardized ad hoc questionnaire which allows for the scientific comparison of data about farmers' motivation before and after the implementation of PTD-workshops, i.e. before and after farmers are exposed to participatory tools.

Hypothesis 1 leads to the third research question that is posed by the author for scientific purposes in contrast to the previous questions that rather refer to practical aspects:

3. Do participatory tools evidently have effects on motivation degrees of participants of participatory workshops? And if so, which effects are measurable?

Further Assumptions

The field study is a snap-shot of conditions in the research area and can only be understood as an attempt to outline potential starting points for further and advanced PTD-activities. The evaluation of PTD-impacts on product level generally appears easy since new technologies or innovative farming practices can be identified easily. Yet, results on this level are difficult to obtain in the referred field study because the experimentation with new technologies can be considered as an advanced PTD-result that requires advanced skills of all people involved or at least it requires a notion of participatory philosophy and practice of the involved target groups. Capacity building is thus a precondition of advanced experimentation with new technologies. At the time of the field work experimentation with new technologies, i.e. PTD on product level, was at the very beginning; hence field work activities took place predominantly in form of capacity building (PTD on process level). Therefore, the evaluation on process level is given more attention. Likewise, the evaluation of PTD-impacts on process level appears even more subtle and challenging since the impact of capacity building is difficult to measure. However, long-term effects on farmers' participation such as e.g. active participation in local groups cannot be measured within the short time of the survey. Thus, the survey's focus lies on the measurement of individual and group-wise degrees of motivation: the aspect which is supposed to be best measurable during the short field stay in relation to the variety and intensity of requirements.

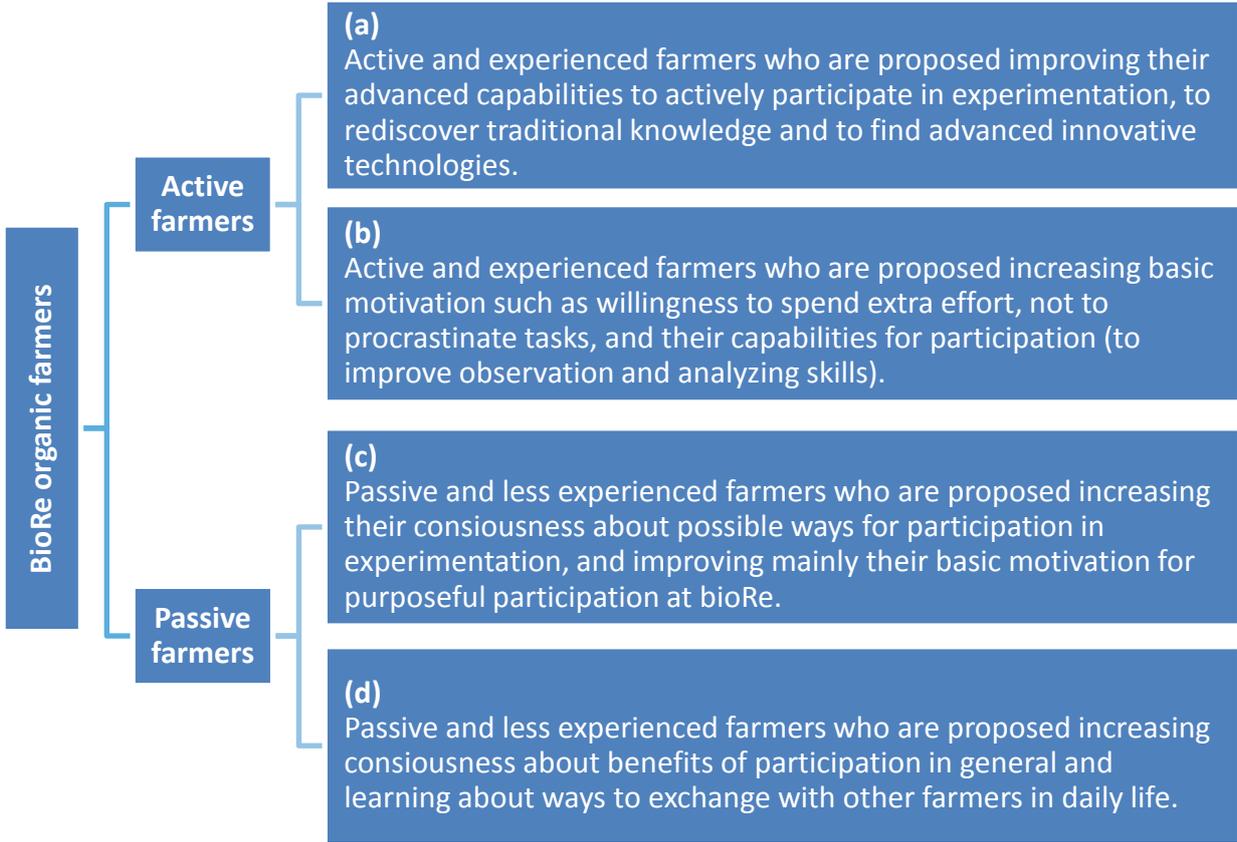
After consultation of local experts such as agricultural extensionists (consultants) and bioRe researchers it is assumed that categories of farmers can be built according to their forms of motivation and deficits in motivation, respectively. A categorization signifies a

simplification of reality but it is necessary in order to reduce complexity as well as for the offering of custom-made participatory workshops for each group with selected participatory tools that are appropriate to the target group. The especially developed standardized motivation questionnaire can reveal driving forces of motivation of individuals, as well as the intensity of motivation. Group-wise motivation profiles can be reconstructed and be used to categorize farmers according to their motivation type.

5.5 Target groups of the case study

In the first instance, four major motivation types can be derived theoretically by crosswise combination of specific presumed attitudes of bioRe organic farmers. The below categorization was worked out jointly with local experts of the FiBL/ bioRe research team:

Figure 22: Theoretical categorization of bioRe organic farmers according to motivation degrees



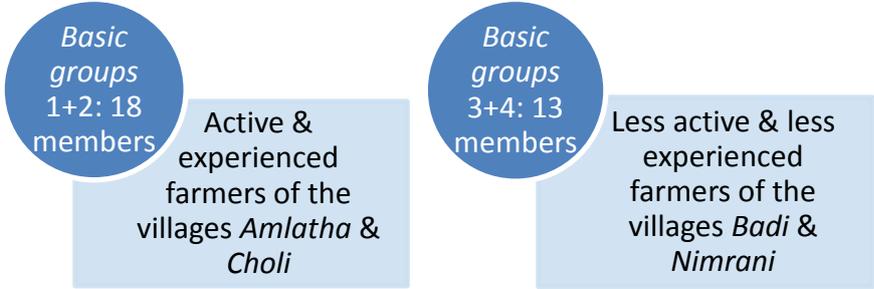
Source: ZAHUMENSKY 2013

The classification is illustrated hierarchically according to assumed declining degrees of motivation and accompanied increasing difficulties in stimulating the category's degree of motivation. Category a) is assumed to have the highest degree of motivation while category

d) is assumed to have the lowest average motivation degree. Furthermore, it appears more feasible to stimulate farmers' capabilities or skills where a basic willingness for participation already exists. Besides, this potential of external stimulation of motivation for participation generally appears more successful and feasible with active farmers than with passive farmers. Thus, the opposite poles of the hierarchy are on the one hand active farmers who are principally motivated and may just be encouraged to participate. On the other hand, there are passive farmers who are assumed to neither command skills nor to have a high willingness or motivation to participate.

The initial survey sample size consists out of 39 bioRe organic cotton PTD-farmers who participate in the on-farm experiment about the improvement of soil phosphate content by application of phosphate rock. These farmers are considered as more active per se in comparison to other bioRe organic farmers, since participation in the PTD on-farm experiment takes place on voluntary base. The sample is composed of all PTD-farmers from the villages *Amlatha*, *Choli*, *Badi*, and *Nimrani*. They were, at first, divided into four groups according to their residence. During the survey out of 39 individuals 31 could finally be included into the statistical evaluation about motivation degrees¹⁴¹. For the purpose of the highest possible contacts and possibilities for exchange the 31 PTD-farmers have been subdivided into two workshop groups. Nearby villages have been grouped for logistic reasons.

Figure 23: Ad hoc categorization of bioRe organic PTD-farmers



Source: ZAHUMENSKY 2013

Active and experienced farmers (*basic group 1* and *basic group 2*) can be understood as advanced and more active since they are participating for the second time in the PTD-cycle, while the less experienced and less advanced farmers (*basic group 3* and *basic group 4*) can be understood as less active since PTD is a new experience for them. Due to the logistic practicability it was difficult to form workshops groups according to the highest homogeneity of motivation degrees. If homogeneity of participants would have been

¹⁴¹ Reasons for the loss of members in the sample of the group of investigation (PTD-farmers sample: -20.5%) as well as in the control group (non-PTD-sample: -28%) were missing data in the standardized questionnaire, disaccording interviewees in Pre- and Post-survey of the standardized questionnaire, and non-participation in one or more participatory workshops.

prioritized workshop groups probably would have been composed of PTD-farmers from different and distant villages with the accompanied logistic efforts to unite them. Therefore a certain degree of group heterogeneity was unavoidably accepted. Problems of this heterogeneity will be discussed in chapter 7.

For the purpose of a better validation and a clearer visualization of expected differences in the motivation degrees a control group of 25 bioRe organic non-PTD-farmers was built additionally (*basic group 5* and *basic group 6*). Farmers of the control group are assumed to be the least experienced and least active farmers since they are not participating voluntarily in the PTD-experiment. Out of initially intended 25 individuals in this random sample 18 turned out to be valid cases for statistical evaluation. The 18 non-PTD-farmers were planned to be divided into two groups, but due to low participation of those group members in the first workshop, it has been decided to put them together to one workshop-group. For the statistical evaluation they have been again divided into two groups:

Figure 24: Ad-hoc control group of bioRe organic non-PTD farmers



Source: ZAHUMENSKY 2013

5.6 Objectives of the case study

Several objectives are expected to be achieved during the field study. Some represent desired practical results of the internship¹⁴² but the most refer to scientific investigations of the field survey. Most of the objectives focus on creating a basis for further advanced participatory research and PTD in the research area. Other objectives pay more attention to scientific outcomes such as the attempt to test hypotheses.

Objective 1: Data about motivation

Through the standardized questionnaire as well as through the participatory evaluation of applied PTD-tools both formal and informal data about motivation degrees and driving forces for motivation of a sample of bioRe organic farmers are gathered. It is assumed that the obtained data allows for the selection of such methods which are most probably

¹⁴² The case study was conducted during an internship at bioRe India Association on behalf of FiBL. Conducting the survey about motivation was the major task of the internship but it was not the only one.

accepted by the farmers and which seem to be most effective on their motivation for participation due to their high acceptance among farmers.

Objective 2: Methods guide

A methods guide with the most suitable participatory tools can be developed. This guide serves as a training manual for the local participation agents/ research team and is designated for internal use at FiBL.

Objective 3: Farmers' empowerment and capacity building

The participatory workshops increase the farmers' awareness about their potential in experimentation, their influence on the generation of locally adapted and self-made solutions for agricultural problems and their active participation in the PTD-project.

Objective 4: Capacity building of the FiBL/ bioRe research team

At least one local participation agent of the FiBL/ bioRe research team (the main responsible for the PTD) is profoundly trained in participatory methods and enabled to methodically train the bioRe extensionists. By this way, the basis for a multiplicatory effect of PTD in the research area is provided.

Objective 5: Basis for PTD-follow-up

Once the farmers and bioRe research staff are familiar with participatory philosophy and the implementation of the respective methods, they can advance to the self-reliant implementation for *Participatory Technology Development* without external support. A basis for the bioRe PTD-follow-up is built.

Objective 6: Evidence for PTD-impact

Finally, evidence for the impact of PTD-workshops at least on process level is provided. The outcomes of the PTD-workshops, as well as the results of the standardized motivation questionnaire deliver data with regard to the question whether participatory workshops affect individual motivation degrees or not, and how this causal relationship can be evaluated.

5.7 Methodology of the case study

Since various empirical research methods have been used during the field study triangulation is envisaged for the cross-checking of interpretations of the case study results (cf. HARDWICK 2009: 441f; ROBSON 2011: 161ff.; see also Introduction: research approach). The applied research methods are participatory appraisal and evaluation methods that have been realized during PTD-workshops, participant field observations, semi-structured expert interviews as well as a standardized questionnaire about motivation degrees, including methods of descriptive statistics.

5.7.1 PTD-workshops, workshop groups, and applied participatory tools

The specific participatory tools which have been applied during the PTD-workshops are *Historical Diagram*, *Impact Diagram*, *Direct Matrix Ranking*, *Pairwise Ranking*, *Expectations Matrix*, *Scenario*, *Transect Walk*, *Field Observation* with observation sheet in small groups, *Field Observation* in the plenum (= in the complete workshop group), *SWOT Analysis*, and the points method for evaluation purposes. Emphasis was laid on tools which foster the analyzing and discussing skills of farmers. For the implementation of PTD-workshops three workshop groups were built and for every of the three workshop groups there was conducted one *workshop 1* (WS 1), one *workshop 2* (WS 2), one *final workshop* (FWS) for workshop groups 1 to 4 (with separation of workshop groups 1+2 and workshop groups 3+4 during the final *points evaluation*), and one FWS for each workshop groups 5+6 that corresponds to *basic groups* 5+6 (see table 8).

In WS 1 mainly introduction and analysis methods have been applied, while in WS 2 focus was laid on experimentation and evaluation methods. In the FWS mainly evaluation tools have been realized. Each WS contained at least 2 different participatory tools. In sum, nine workshops have been conducted with the shortest possible time gaps between each WS on the one hand, and between the pre- and post-survey of the standardized questionnaire on the other hand.

Table 8: Sequence of applied participatory tools during the PTD-workshops

Farmers basic groups	Workshop Group (WSG)	Workshop (WS)	Applied participatory tools
Basic group 1 Amlatha PTD's	WSG 1+2	WS 1	1. SWOT-Analysis of current PTD experiment with phosphate rock 2. Pairwise Ranking of parameters of agricultural production 3. Points evaluation of applied methods in WS 1
Basic group 2 Choli PTD's		WS 2	4. Exchange Visit/ Field Visit on farmers' fields in <i>Choli</i> and <i>Amlatha</i> with resulting Observation Matrix about performance of PTD-treatments 5. Impact Diagram of two selected most promising treatments 6. Points evaluation of applied methods in WS 2
Basic group 3 Badi PTD's	WSG 3+4	WS 1	7. Expectations Matrix (visual) of desired and undesired agricultural development in the region 8. Matrix Ranking of parameters of agricultural production 9. Points evaluation of applied methods in WS 1

Basic group 4 Nimrani PTD's		WS 2	<p>10. Group Field Observation (with observation sheet for scoring of treatment performance)</p> <p>11. Calculation Matrix Summary with scores about pos. /neg. observations of crop performance under different treatments and Matrix Ranking of treatments</p> <p>12. Points evaluation of applied methods in WS 2</p>
Basic groups 1-4 All PTD's from all villages under investigation	WSG 1-4	Final workshop (FWS)	<p>13. PTD-Exposition about general PTD-results and with crossword puzzle of elements of the FiBL/ bioRe research that served for a broad exchange of all PTD-farmers of the four villages in the research area</p> <p>14. Points evaluation of all applied methods in order to observe evaluation variances in comparison to single evaluation of applied methods after WS 1+2¹⁴³</p>
Basic group 5 Choli non-PTD's	WSG 5+6	WS 1	<p>15. Historical Diagram of (agricultural) development in the region</p> <p>16. Scenario/ Expectations Matrix of parameters of agricultural production in the region</p> <p>17. Points evaluation of applied methods in WS 1</p>
Basic group 6 Nimrani non-PTD's		WS 2	<p>18. Transect Walk on FiBL/ bioRe trial about performance of different cotton varieties</p> <p>19. Impact Diagram FiBL/ bioRe on-station trial and comparison conv. vs. org. farming systems</p> <p>20. Points evaluation of applied methods in WS 2</p>
Basic group 5 (Choli non-PTD's)	WSG 5	FWS¹⁴⁴	<p>21. Points evaluation of all applied methods in order to observe evaluation variances in comparison to single evaluation of applied methods after WS 1+2</p>

¹⁴³ The *points evaluation* of applied methods was realized separately in each *workshop group*, i.e. one in *workshop groups 1+2*, and one in *workshop groups 3+4*.

¹⁴⁴ For logistic reasons the FWS of non-PTD-farmers were realized separately in each village.

Basic group 6 (Nimrani non-PTD's)	WSG 6	FWS	22. Points evaluation of all applied methods in order to observe evaluation variances in comparison to single evaluation of applied methods after WS 1+2
---	--------------	-----	---

Source: ZAHUMENSKY 2013

5.7.2 Participatory evaluation of applied PTD-tools (qualitative evaluation)

The participatory evaluation - or qualitative evaluation - of PTD-tools took place at the end of each workshop and in each workshop group. At this, the farmers were given 5 adhesive evaluation points for each tool that was to be evaluated. The farmers were asked to allocate the points according to their individual preference of tools by estimating advantages and disadvantages as well as according to their intuitive pleasure during the application of the method. The author decided to provide an uneven number of points with the objective to provoke decisions on preferential tools. By the end of the field work, all *points evaluations* were reviewed, analyzed and interpreted under consideration of participant observation.

5.7.3 Field observations

Whenever possible informal field observations were made and discussed within the participation team. The participation team is composed of the members of the research team with responsibility of the participatory component of the PTD-project. The interdisciplinarity of the team served for the cross-checking of observations and interpretations since it was composed of members of the local bioRe research team (science) and local bioRe agricultural extensionists (agricultural consultancy), insiders and outsiders (local bioRe staff vs. the author and FiBL supervisor), as well as female (the author) and male team members (all the others).

5.7.4 Standardized questionnaire about farmers' motivation degrees (quantitative evaluation)

Since any human behavior is premised on specific psychological incentives the general question of the case study with regard to motivation is not if somebody is motivated but rather how and how much an individual is motivated. In order to measure typical behavioral patterns and the effect of participatory tools on farmers' attitude concerning general motivation and motivation for participation a standardized multidimensional personality test has been developed including an external assessment with two subtests as well as a self-evaluation of farmers about the motivation intensity of basic motivation facets (questionnaire see annex 2). Thereby, the theoretical concepts of intrinsic motivation (self-determined behavior) and extrinsic motivation (incented by request; expected remuneration

is driving force of conducted action) served as a basis. For the case study both forms of motivation are relevant since it was intended to explore as much potentials of farmers' motivation as possible in order to compile adequate participatory workshop tools.

The motivation questionnaire was conducted twice; once before and once after the participatory workshops (pre- and post-survey). This happened for the purpose to compare motivation degrees before and after farmers have been exposed to participatory tools which are supposed to positively affect motivation degrees. Initially, the obtained data about motivation degrees served as an entry point for the participatory workshops as they allowed for the identification of categories of farmer motivation types and farmer groups. Subsequently, the comparison of pre- and post-survey results clarified the motivation structure of the sample as well as they visualized presumed impacts of the participatory workshops.

The setup of the standardized motivation questionnaire is based on the *Achievement Motivation Inventory* that was developed in 2001 by the German psychologists SCHULER and PROSCHASKA. The questionnaire encompasses a first part for the external assessment of basic motivation facets, a second part for the external assessment of motivation for participation in participatory research, as well as a third part for the self-assessment of the motivation intensity of basic motivation facets. Following psychological process theories of the 1960s, and especially SCHULER & PROSCHASKA'S array of motivation facets that they had developed in their *Achievement Motivation Inventory (AMI)*¹⁴⁵, the author selected only facets of basic motivation that are relevant for the case study. Additionally, facets of motivation for participation were developed. All facets were intended to be assessed through an ad hoc developed item pool of behavioral indicators.

The selection process encompassed three discussion groups about possible motivation facets, their definition and adequacy or relevance for the target groups. The discussions were realized within the local bioRe research team and the FiBL-supervisor as well as with the management of bioRe association and executive staff of bioRe Ltd. At this selection process the item pool of behavioral indicators has finally been composed according to the presumed highest differentiation capability for manifestations of the assessed motivation items within and between different farmers groups (cf. '*external or criteria oriented strategy of test design*' according to MOOSBRUGGER & KELAVA 2012: 37). The finally selected general motivation facets of the external assessment part are *Confidence in Success, Goal Setting, Self-Control, Eagerness to Learn, Flexibility, Fearlessness, Competitiveness, Pride in Productivity, and Compensatory Effort*.

The selected facets of motivation for participation in participatory research were built ad hoc and by intuition¹⁴⁶. They have been added as part two to the AMI-oriented part

¹⁴⁵ AMI is a measuring tool for the assessment of professional achievement motivation.

¹⁴⁶ During test design the author did not follow one single strategy of test construction but has chosen a mixed and multileveled procedure of rational (deduced from elaborated test items according to SCHULER & PROSCHASKA

one. Thereby, motivation for participation was defined as motivation for participation in participatory agricultural research processes, i.e. participation in alternative methods of planning and research that involve farmers as active creators of information and knowledge. Context-dependently, knowledge creation refers mainly to the creation of location-specific technologies and the acquisition of knowledge or competencies of self-management. The latter can also be denoted as capacity building or empowerment. Given that empowerment is understood as a form of the individual potential for developing analyzing capacities and skills (observing, selecting, manipulating with plants, tools, and environment) as well as mobilizing potentials (group formation, mutual exchange) there have been sorted out three key facets of empowerment: *Decision Making*, *Ownership*, and *Capacity Building* in form of measures offered by FiBL/ bioRe with the aim to enhance participants' skills in experimentation and communication. In view of the fact that PTD bases on experimentation the interest in *Experimentation* was also selected to be assessed, as well as the *Valorization of (traditional) Indigenous Knowledge* as expertise that is equal to scientific knowledge. Finally, *Identification with the new Role as Researcher* was also included to be assessed in order to gather information about the willingness to cooperate with outside researchers and the readiness to spend extra effort for scientific working. All these facets are intended to be assessed through the second part of the motivation questionnaire. The second part bases on the first part, and hence, various general motivation facets are included in the more complex motivation facets of part two. For a detailed description of all selected facets see annex 3.

The questionnaire encompassed only judgment tasks with gradual response mode. In part one and two usually two questions for each motivation facet were asked¹⁴⁷ where the interviewee was asked to specify his degree of agreement or disagreement on a verbal bipolar 7-point rating scale with a neutral medium category¹⁴⁸ (from '*I strongly agree*' over '*undecided*' to '*I strongly disagree*')¹⁴⁹ (see figure 25). In the third part of motivational self-evaluation the interviewee was asked to rate the estimated intensity of driving forces of the nine basic motivation facets on a 5-point scale (with five points representing the maximum intensity of driving force of the respective facet).

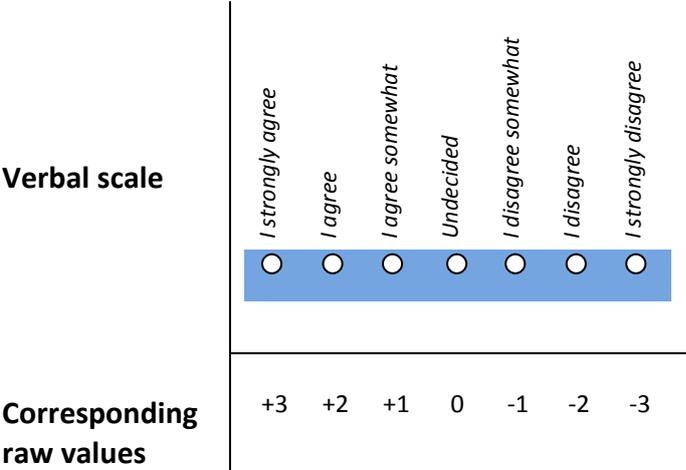
2001) and intuitive (ad hoc) item construction. Especially during the construction of the test battery of part two (motivation for participation) the author could not refer to theoretical backgrounds or empirical experiences. (cf. MOOSBRUGGER & KELAVA 2012: 36)

¹⁴⁷ The facets *Ownership* and *Experimentation* were assessed only by one question that will be statistically double-weighted in the evaluation.

¹⁴⁸ The neutral middle category in form of '*undecided*' was chosen in order to explicitly offer a fallback option. Since there is the qualified presumption that some interviewees in the case study don't have a distinct opinion about the object of study the neutral middle category can avoid 'misuse' of the category (choosing the middle category due to difficulties in task comprehension or exhaustion of long test duration, etc.), and hence validity problems of the questionnaire results can be minimized. (cf. MOOSBRUGGER & KELAVA 2012:54)

¹⁴⁹ In practice and especially with illiterate farmers the questionnaire was often conducted verbally and hence, there was also used an appropriate bipolar symbol scale.

Figure 25: Codification of the response scale of the standardized questionnaire about motivation



Source: ZAHUMENSKY 2013

In the analysis stage, the interviewees obtained either low or high raw values according to their answers. The rating scale has been coded in the above categories (question number 9 was coded reverse and served as a catch question for the estimation of response coherence). The total motivation score per person was calculated by summarization of all item raw scores. Facets that were assessed only by one item were double-weighted. On the basis of item-scores individual motivation polygons could be developed which allowed for the identification of individual and group-wise low-score and high-score facets, and the categorization of farmer groups with similar total scores. This classification served as starting point for the PTD activities in the case study since it revealed low-score facets which were desired to be stimulated during the participatory workshops.

5.7.5 Semi-structured expert interviews

In addition, two semi-structured interviews have been conducted in order to triangulate observations and results about the impacts of participatory methods and in order to discuss participatory practice in the research region against the backdrop of post-development criticism (see annex 4 & 5 for guiding questions of the interviews). The interviews were conducted with:

- Organic cotton pioneer: Mr. PATRICK HOHMANN (CEO at REMEI AG, Switzerland)
- Local expert: Mr. VIVEK RAWAL (CEO at bioRe Association India and at bioRe India Ltd.)

6. Results

6.1 Capacity building

Capacity building of the Indian research staff members was challenging and time consuming since there was no experience with *Participatory (Action) Research* (P(A)R) amongst the team members and partially little experience with scientific working, especially a lack of experience with qualitative social-scientific research methods. The capacity building aimed on training especially one colleague in the self-confident application of a variety of PTD-tools. First of all, the individual training envisaged to enable the colleague to take over responsibility for any participatory research activity within the FiBL/ bioRe research project with the objective to contribute to the PTD-follow-up and thus to the sustainability of the PTD-component of the FiBL/ bioRe research project. Moreover, training at least one local member of the FiBL/ bioRe research staff in the application of participatory tools was indispensable for the practicability of participatory workshops since this local colleague's task field encompassed among others to assist the main facilitator (the author) during the workshops primarily for translation purposes.

After a first theoretical introduction into guiding principles of participation, the role of insiders and outsiders, background, development and idea of *Participatory Technology Development* the author trained the local future participation expert, Mr. MANDLOI, in participatory tools through 'learning by doing'. For this purpose two half day *test workshops* have been realized. Besides its capacity building function the first *test workshop* served for a probing of the stage of knowledge and the familiarity with participatory tools within the local PTD-research team, of local workshop culture, possible group dysfunctions, and ways of communication among farmers. Image 1 illustrates the application of a kind of *Historical Diagram* during the first *test workshop* with elderly farmers in *Choli* village.

Image 1: Test workshop 1 with elderly farmers of Choli village



Source: ZAHUMENSKY 2010

During this first *test workshop* there could be made some important observations. First of all, it proved to be very advantageous to test the intensity and the form of teamwork between the main facilitator and co-facilitator. Both had to feel their ways towards the other, and they initially had to find their position and check out codes and ways of (non-verbal) communication that remained unnoticed for the workshop participants. Furthermore, during the *test workshops* it became clear that participatory capacity building should focus on training how to avoid suggestive questions.

Another observation was that the local PTD-research staff selected mainly elderly village residents to be participants of the first *test workshop* since they were assumed to have the most knowledge. In addition, they were assumed to best inform the research team about local conditions and developments. This idea illustrated the hitherto one-sided rather 'extraction-of-knowledge'-oriented definition of participatory workshops. Hence, the test workshop excellently served to address the benefit for participants during the workshops and the non-extractive and process-oriented approach that was intended by the author. Besides, for the author it was also very suitable to test the own participatory skills and leading competencies, to work in an unusual ambition, to show a self-confident manner, to simultaneously facilitate and train, to wait and listen for answers which were not understood by the author, and to finally depend on signals from the co-facilitator to lead the workshop in English language without being able to adequately respond to answers that were given from participants in Hindi language. Based on these insights, the author and co-facilitator agreed on a translation mode according to the motto 'as much translation/information as necessary and as less as possible'.

Methodologically, the facilitators jointly preselected and practiced the application of several participatory methods that seemed to be suitable in order to lead to their creative

application during the workshops. An increased security in methods application was therewith obtained. By the end of the author's stay, it could be observed that this way of cooperative team work was internalized by the local participation expert, as well as a change in active interaction from the Indian side became apparent. Besides, the local participation expert and co-facilitator soon showed much more self-confidence due to the granted responsibility of being chief participation agent on the one side as well as due to the associated increased position of esteem amongst farmers and amongst other research team members on the other side. There was also a change in attitude towards the farmers during the workshops: local and external researchers recognized the value of farmers' knowledge and started or intensified considering them as coequal research partners. Objective 4 was reached successfully, as well as important steps with regard to delivering a base for a PTD-follow-up were observable (objective 5).

The second *test workshop* was implemented as a training workshop with the intention to reach a broader clientele of persons responsible who generally are in close and frequent contact with farmers as well as for the purpose of an increased spreading of participation agents. Therefore, a participatory workshop with local bioRe agricultural extensionists (consultants) was additionally conducted. Those were primarily desired to get in touch with participatory philosophy, to discuss its potentials and constraints, and to train skills in conducting participatory tools. Moreover, the author sought for the opinion and advice of local experts, for estimations about local knowledge, for the discussion of difficulties in applying participatory tools with bioRe farmers, as well as for indications with respect of the general dealing with farmers. Finally, it was also envisaged to positioning the participation agent of the research team (Mr. MANDLOI) as bioRe's chief participation agent amongst bioRe agricultural extensionists. Both the gathering of informal information about local conditions as well as the positioning of the chief participation agent can be reported as having been successful. Image 2 shows the enthusiasm of bioRe extensionists during the second *test workshop*.

Image 2: Test workshop 2 with bioRe agricultural extensionists (consultants)



Source: ZAHUMENSKY 2010

During this *test workshop 2* there could also be made some relevant observations. In the first instance, the degree of pro-active participation amongst bioRe extensionists was very high. The participants informed that the high interest arose from the realization that participatory tools have a high potential for innovations in consolidated modes of communication between extensionists and farmers. In informal conversations the extensionists lamented a certain fatigue of farmers with regard to the consultants' agricultural advice and their repeated controlling of farmers' organic practices. They all were already well before interested in alternative ways of communication in order to re-attract farmers' attention. Accordingly, the realization of participatory tools during the workshop took place under high attention on discussing them on meta level, i.e. discussing strengths and weaknesses on process level, as well as the practicability of selected participatory tools with bioRe farmers. One very helpful advice from extensionists' side was for example not to conduct a *Flow Diagram* with farmers in order to avoid an overcharge and thus a possible lack of outcomes. At the same time, the extensionists principally judged participatory tools as very suitable for the target groups of the case study even though the tools tend to demand much effort from farmers. Furthermore, the extensionists ensured that farmers would enjoy the tools and utilize them for their benefit once they would have had figured out the tools' advantages.

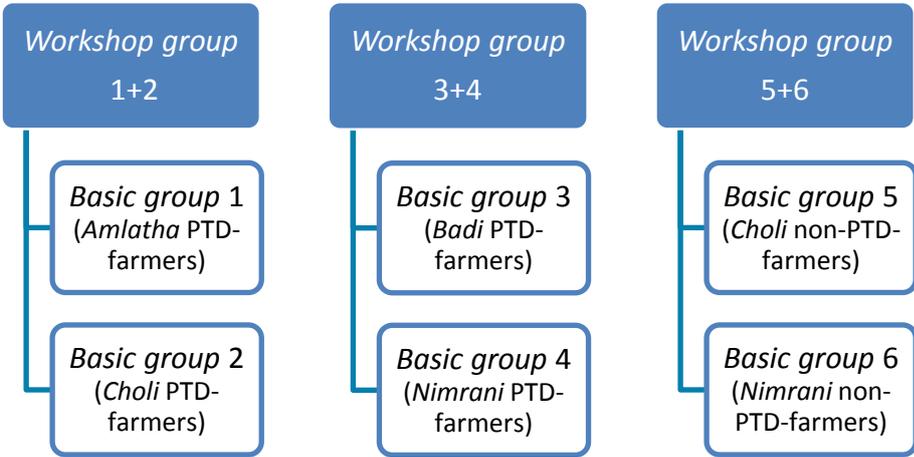
At the end of the second *test workshop* the extensionists reported that they left with the impression of having learned something, of having contributed to the success of a survey, and of having received training in methods to retrieve farmers' attention. Finally, the demand for further training workshops was voiced.

6.2 Participatory evaluation of PTD-tools (qualitative evaluation)

The evaluation of PTD-tools was approached from two perspectives for triangulation purposes and thus for the increased validation of findings. On the one hand, group-wise participatory evaluations of the tools were realized in order to obtain information about bioRe farmers' *group-specific* preferences of PTD-tools. On the other hand, the possible indirect impacts of PTD-tools on *individual* motivation degrees were measured by help of a standardized questionnaire. From the first evaluation approach the most likely preferences of PTD-tools according to farmer groups will be worked out. From the second evaluation approach variances in motivation degrees before and after having been exposed to participatory tools can be derived.

The participatory evaluation of PTD-tools took place in the context of participatory workshops that were realized in the research area. Since the participation team who realized the workshops consisted only of two facilitators (the author and the Indian chief participation agent of the FiBL/ bioRe research team) the number of workshops had to be reduced to a manageable number within a time frame of three weeks between 09/21/2010 and 10/11/2010. Moreover, short intervals between the workshops prevented a receding memory of the applied tools from the farmers' side. Besides, a condensed schedule was also in every farmer's interest due to the pending harvest season. For an additional reduction of efforts and due to logistic reasons the farmer *basic groups* were grouped to *workshop groups* that were assumed to be the most homogeneous as possible. The categorization was effected according to the participants' status of knowledge, PTD-experience, eagerness to learn, flexibility and estimated degree of active participation among others. Finally, during the application of participatory workshops the participating *basic groups* of PTD-farmers and non-PTD-farmers of the four villages of investigation were grouped to the three following *workshop groups* (see figure 26):

Figure 26: Grouping of *basic groups* of investigation to de facto *workshop groups*



Source: ZAHUMENSKY 2013

There were finally realized nine differing participatory workshops in the field:

- Three *workshops 1* (one in each *workshop group*)
- three *workshops 2* (one in each *workshop group*)
- and three *final workshops* (one in *workshop groups 1-4* and one each in *basic group 5* and *basic group 6*)

Two participatory tools were conducted in each of the *workshops 1* and *workshops 2*. The *final workshops* (FWS) of *workshop groups 1-4* (where all PTD-farmers were grouped to one *workshop group*) methodologically differed from the FWS in *workshop group 5* and *workshop group 6* insofar as the FWS of all PTD-farmers encompassed a final PTD-exposition in addition to the obligatory final *points evaluation* at the end of each FWS. The FWS in the control group of non-PTD-farmers (*workshop groups 5* and *6*) only consisted of the final *points evaluation* of applied participatory tools.

In the following, the most significant observations of all workshop tools as well as the most general results of the respective *points evaluations* will be illustrated systematically. For reasons of clarity and comprehensibility, results and observations of all tools of all workshops (*workshops 1* to *final workshops*) from *workshop groups 1* to *6* will be described one by one and in the sequence as the tools have been introduced in table 8. Due to logistic reasons this chronology does not correspond to the sequence of the actual application in the field. But the sequence of workshops (WS 1, WS 2, FWS) was always the same with all farmers groups and it was paid attention to keeping similar time intervals between all workshops in order to guarantee equal conditions of evaluation.

For reasons of a systematical presentation of all case study results the results of the standardized questionnaire (pre- and post-survey) will be illustrated separately in the following chapter 6.3. Debatable findings of the evaluations will be addressed in chapter 7.

6.2.1 Workshops 1 (WS 1)

Tools during the *workshops 1* emphasized on introducing and analyzing tools while the aspiration level of the tools varied according to the estimated level of knowledge, status of experience with the PTD-project as well as according to the willingness for active participation amongst participants of the respective *workshop group*.

6.2.1.1 Workshop 1: *workshop group 1+2* (Amlatha and Choli PTD-farmers)

SWOT-Analysis and *Pairwise Ranking* were applied during *workshop 1* in this *workshop group*. In the following their main outcomes will be briefly addressed. Moreover, general observations of group dynamics will be outlined as well as the results from the *points evaluation* will be visualized.

– **The SWOT-Analysis of PTD-experiences**

This group of the most advanced and most experienced PTD-farmers was already challenged during the first workshop tool since *SWOT-analysis* was used as a tool for the analysis of strengths, weaknesses, opportunities and threats of the project on meta level. Image 3 illustrates the result of the *SWOT-Analysis* of the activities and the experiences of the ceasing first PTD-project cycle.

Image 3: SWOT-Analysis - WS 1 in WSG 1+2 (Amlatha and Choli PTD-farmers)



Source: ZAHUMENSKY 2010

The below-mentioned translation of the *SWOT-Analysis* reveals that the analysis of PTD-activities took place on an advanced level and that the farmers reflected the PTD-process critically. In this group participation is considered as PTD-strength and it is judged as precondition since PTD fails without farmers' participation. It is very interesting information that the workshop participants mind about their duty to deliver innovative technologies. At the same time they critique the restriction of PTD to organic techniques (see illustration below):

Strength <ol style="list-style-type: none"> 1. Increased soil fertility 2. Observation of compost 3. Active participation that allows for more information 4. Improved crop quality 	Opportunities <ol style="list-style-type: none"> 1. Participants get more information 2. Use the time 3. Increased quantity and quality of compost 4. Planning means better results 5. Gathering scientific information
Weaknesses <ol style="list-style-type: none"> 1. No timely (!) information/ advice 2. PTD weak if there is no participation of farmers 3. Observations should be taken promptly (!) 4. Trial layout is challenging 5. There is no soil testing 6. Difficult for illiterate farmers 7. Poor awareness amongst farmers 	Threats <ol style="list-style-type: none"> 1. PTD fails if farmers don't participate 2. Through PTD farmers can suggest new topic of research to researchers that may be more relevant to the farmers 3. Restriction to organic techniques. What happens if we don't generate new techniques?

Since the focus of the qualitative evaluation does not lay on outcomes on product level but rather on the evaluation of processes in relation with the applied tools the most significant observations with regard to the tool's judgment by farmers is listed in the following. These observations base on informal participant observation.

– **Positive observations with regard to *SWOT-Analysis***

- This tool was conducted in the plenum and thus, all farmers' participation was asked. Especially the most experienced PTD-farmers of the village *Amlatha* intensely participated and carried other farmers.
- There was an animated and ambitious discussion about the local PTD-project on meta level. The comparison of potentials and limitations of PTD pointed out PTD-specific controversies.
- The analytical character of the tool was judged very favorably.
- The farmers appreciated the intention of the research team to consult farmers' opinions by means of this tool.
- Farmers recognized that dialog is one crucial element in PTD and that both famers and researchers are intended to cooperate as coequal partners. The farmers informed that they experienced the recognition of farmers' traditional knowledge from researchers' side.

– **Negative observations with regard to *SWOT-Analysis***

- This tool visualizes on a high level. The use of symbols or pictures is limited. Therefore, farmers with lower education levels behaved more reserved due to the lack of illustration by help of symbols or drawings.

- *SWOT-analysis* is an advanced tool and thus it is rather suitable for PTD-experienced farmers who already command analytical skills and abstract imaginative power.

In general, *SWOT-analysis* was accepted very well by the participants of this *workshop group* since it was considered as adequate in the aspiration level and as meeting the farmers' desire for the consultation of their perception of the first PTD-cycle.

The second tool of *workshop 1* in *workshop group 1* and *2* was *Pairwise Ranking*.

- ***Pairwise Ranking of aspects in agricultural production*** (application of micro nutrients, farming practices such as dry mulching, pest control, seed varieties, or quantity and quality of crops)

Pairwise Ranking is a tool that allows for the ranking of topics or parameters and that helps identifying participants' priorities with respect to the importance of topics. During the elaboration of this tool farmers are asked for relevant topics that, according to their view, relate f.i. to agricultural production. At finding group consensus about the selection of main topics criteria for the selection come to light as a side effect. In *Pairwise Ranking* the topics are listed on two axes so that a matrix can be created. After that, the topics can be systematically weighed against each other and the respective weightier topic is written in the empty fields of the matrix. By the end, it is counted how often each topic has been mentioned whereupon a ranking can be made (the more often a topic was recorded the higher the rank).

Image 4: *Pairwise Ranking* - WS 1 in WSG 1+2 (Amlatha and Choli PTD-farmers)



Source: ZAHUMENSKY 2010

The most relevant observations of the tool's judgment by farmers as well as observations of group processes are listed below.

– **Positive observations with regard to *Pairwise Ranking***

- This tool was conducted in the plenum. Thus, all farmers' participation was asked.
- There was animated discussion about organic farming techniques.
- Farmers gave the feedback that *Pairwise Ranking* is a simple tool that can be conducted even with illiterate farmers.
- At the same time it is suitable for literate or advanced farmers since, according to the farmers, there are two levels of the tool. At first, each farmer had to decide individually about his award for points for each topic. Afterwards, the plenum had to build a consensus of the scoring that represents the opinion of all participating farmers.
- This group perceived the tool as new method for the consultancy of farmers' opinions. The innovative character was judged favorably.

– **Negative observations with regard to *Pairwise Ranking***

- The procedure of the tool was conceived rapidly. Therefore, the almost mechanic process of comparing elements was perceived as time consuming, long-winded and boring. Only after the ranking of parameters had become apparent interest reemerged within the group.

– **General observations**

There was an animated discussion of PTD-results and processes during both tools as well as a high exchange rate of experiences and opinions between the farmers of both villages. The farmers created the impression that they were very motivated and active. By the end of the workshops the farmers even continued comparing the PTD-results from their on-farm trials. In this group with the presumed most advanced members the group cohesiveness was strong and there was a distinct disposition for innovations in farming techniques amongst the participants.

After the workshop evaluation the participants were asked to suggest an item for the agenda of the following *workshop 2* in this group. The farmers expressed their interest in discussing a new PTD-topic (e.g. variety testing). Additionally, the participants asked for the possibility to make a *Field Exchange Visit* in order to observe experiences of other PTD-treatments in farmers' fields. Very favorably it was judged that the farmers were given the platform to communicate desired PTD-topics and that they were given the chance to actively control the PTD-process in this way.

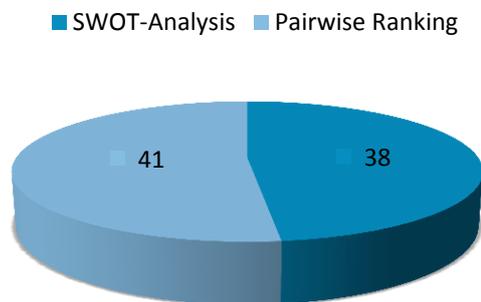
For evaluation purposes of PTD-tools in the context of the case study it was intended to obtain semi-quantitative data from the participatory evaluation of the applied

PTD-tools during the workshop phase. Therefore, a *points evaluation* was realized at the end of each workshop in each *workshop group*. At this, the participants were asked for their judgment of tools and their preference through sticking adhesive points (= evaluation points) on the sheets where the respective tools have been visualized. Finally, the points were counted.

– **Points evaluation in workshop group 1+2 at the end of workshop 1**

Through participant observation during the workshops a first impression about the judgment of tools was received. The *points evaluation* reassures this notion through semi-quantitative data. In the case of *workshop group 1+2 SWOT-Analysis* and *Pairwise Ranking* were judged similarly with a difference of only 3 evaluation points. That means that the farmers did not prefer one of the tools that were applied during *workshop 1*. This evaluation form was very useful since the case study strives for the evidence of the judgment of PTD-tools from farmers' side. The result of the *points evaluation* is visualized below (see figure 27).

Figure 27: Points evaluation - WS 1 in WSG 1+2 (Amlatha and Choli PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

6.2.1.2 Workshop 1: workshop group 3+4 (Badi and Nimrani PTD-farmers)

During *workshop 1* in *workshop group 3+4* there was applied an *Expectations Matrix* as well as a *Matrix Ranking* which are addressed in more detail below. The *points evaluation* of the both tools will also be illustrated.

– **Expectations Matrix** of local agriculture

This tool was designed as matrix in combination with illustrations. Yet, the facilitators rapidly noticed that conducting a matrix in small groups as introduction tool would demand too much from the participants of this workshop group. One reason for the assumed overcharge was the realization that the participants from the different villages did

not know each other. Hence, they first were assumed to be in need of getting to know each other since the small groups intended to mix the participants from the different villages for exchange purposes. The objective of exchange and creating a base of mutual trust were judged as more important than the (probably inadequate) strict adherence to the tool instructions. To this, a more ludic situation had to be created through a tool with a lower aspiration level. Therefore, the Matrix was reduced in situ to the drawing of the status quo and the desired status of agricultural production in future in order to reflect the deficits of the present agricultural situation (see image 5). Additionally, this tool sensitized for the reflection about starting points for change.

Image 5: *Expectations Matrix* - WS 1 in WSG 3+4 (*Badi and Nimrani* PTD-farmers)



Source: ZAHUMENSKY 2010

– **Positive observations with regard to *Expectations Matrix***

- This tool was conducted in small groups where participants of the different villages intentionally were mixed for the purpose to increase exchange and cooperation. Starting with an icebreaker tool was especially relevant in this group since participants of the villages did hardly know each other. This objective could be achieved as well as exchange and cooperation were observable.
- There was the impression that these farmers could participate actively in a content-related discussion for the first time. Amid the applause of other participants group members could present their drawings in the plenum. Applause was eagerly given and gladly accepted.
- Discussions in the small groups were predominantly active.
- In the main, this tool was very suitable as it clearly contrasted undesired and desired developments in agricultural production.

- **Negative observations with regard to *Expectations Matrix***
 - The working steps of the tool had to be explained repeatedly in all small groups.
 - Many participants had scruples to draw and to use the pencil while only some few enjoyed it.
 - Exchange between farmers of the same village was more intense than exchange between farmers of different villages.
 - One participant had difficulties in integrating into the group process and repeatedly reassured his working steps with the workshop facilitators instead of discussing them with other group members. A light degree of insecurity or lack of fearlessness was characteristic for this participant group.

The second tool that was applied in *workshop 1* of *workshop group 3+4* was the *Matrix Ranking* which will be addressed in the following.

- ***Matrix Ranking*** of different parameters of production

The *Matrix Ranking* was chosen as second tool since it allows for the ranking of different parameters of production (yield, water storage capacity, soil fertility) on the basis of criteria such as quantity of compost, quality of compost, irrigation, soil organisms, and farmers knowledge increase. The parameters and criteria are to be inquired during the development of the tool. After the collection of topics and criteria a matrix can be created where the criteria have to be judged with regard to the importance of criteria in relation to the topics on a predefined scale (f.i. 5 points = very important; 1 point = not relevant). By the end of the scoring, there row and column sums can be calculated whereupon high-score criteria and high-score topics can be identified at a glance. Image 6 shows the matrix ranking where f.i. a high relevance of the compost quality for all parameters of production can be noted (row sum of the fifth row).

Image 6: Matrix Ranking - WS 1 in WSG 3+4 (Badi and Nimrani PTD-farmers)

	3000 Yield	1000 Litter size	Score				
कंपोस्ट खाद Compost	5	5	2	3 3	2	5	22
मिथाई डी कार्ड Leads Farming	3	5	5	3	3	5	24
मसालेदार Leads Farming	1	2	5	2	3	5	18
सुखी खाद Leads Farming	5	5	1	5	4	5	25
कंपोस्ट खाद Compost	5	5	4	5	5	5	(29)
मिथाई डी कार्ड Leads	4	3	5	2	1	5	20
Score	23	25	22	20	23 16	(30)	

24.3.10
Badi + Nimrani PTDs
Matrix Ranking

Source: ZAHUMENSKY 2010

The most important observations of group processes during the application of the *Matrix Ranking* are listed below.

– **Positive observations with regard to *Matrix Ranking***

- This tool was conducted in the plenum and thus it required consensus-building capacities in a group where participants rather tended to be reserved.
- Soon there was a bargaining of scorings initiated that the farmers enjoyed a lot. At the same time they deployed their capabilities of consensus-building.
- All farmers participated and at least gave one voting during the application of the tool.
- There was an animated discussion about the different PTD-treatments which the farmers to date experimented with. There was even an unexpected and very advanced discussion about which treatment had achieved the best results with regard to the matrix criteria.
- The farmers also developed a list of observation which should help the participants to consciously observe the treatment performance on their on-farm experiment trials (home task for the purpose to train the observation skills). This observation list was developed on farmers' request.

– **Negative observations with regard to *Matrix Ranking***

- Participants got impatient because they were not used to work for a longer time on abstract tasks. They explained that they would have preferred to spend the time for working on their fields.

- The working steps of looking for and arranging criteria was quite unclear; even for the facilitators the differentiation between criteria and items was difficult to convey.

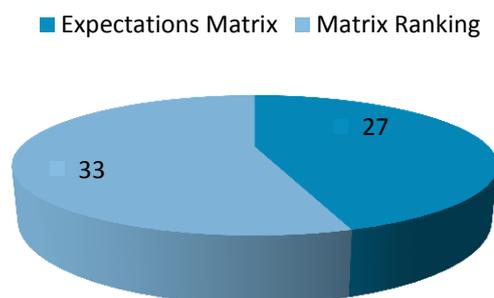
– **General observations**

The participants agreed on the fact that all treatments performed better than the usual local low-input-practice of 'zero treatment'. The farmers revealed that to date they did not have a notion about the experimental character of the PTD-research and they pursued even less knowledge about their role for experimentation. They conveyed rather the impression that they understood PTD as a kind of *Farmer Field School* (a practice they already have known from bioRe Ltd. extension) where they are trained in new organic farming techniques. Developing new technologies or techniques by themselves was not a present idea in their minds. This is due to the lack of PTD-experience of the members of *workshop group 3+4* since they are participating for the first time in the PTD-project cycle. However, the farmers informed that they believe that anyway they will have a crop-related benefit through the PTD-project experimentation (especially the expectation to increase crop yield) even if this expected benefit remained vague.

– **Points evaluation at the end of workshop 1**

Again, the *points evaluation* was realized in order to reassures the perceptions of farmers' judgments of PTD-tools through semi-quantitative data. The detailed result is visualized below (see figure 28).

Figure 28: Points evaluation - WS 1 in WSG 3+4 (Badi and Nimrani PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

With a difference of 6 evaluation points the scoring points of *Expectations Matrix* and *Matrix Ranking* in *workshop group 3+4* are also almost equally distributed. The farmers slightly preferred the *Expectations Matrix*. Apparently, the procedure of *Matrix Ranking* was experienced as boring but in comparison to the *Expectations Matrix* the advanced content-related outcome of *Matrix Ranking* was appreciated.

6.2.1.3 Workshop 1: workshop group 5+6 (Choli and Nimrani non-PTD-farmers)

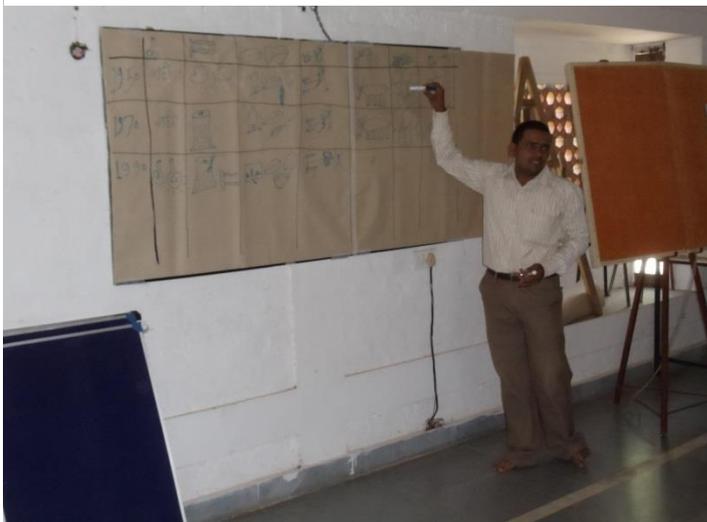
In this *workshop group* a *Historical Diagram* and a combination of *Scenario/Expectations Matrix* were realized during *workshop 1*. There could also be made some important observations of processes and outcomes during their application.

– *Historical Diagram*

By help of a *Historical Diagram* the development of different topics during a certain timespan can be visualized. Therefore, a matrix is drawn with an axis where different time intervals are listed. On the other axis topics of interest are lined up. For each time interval there can be drawn the respective status quo of the topic. By the end of the tool the developments as well as the quality of changes (improvement or deterioration) can be identified at a glance.

On the basis of different parameters of living conditions that were chosen by farmers historical developments in the region between 1950 and 2010 were visualized only by means of symbols. Those parameters were electricity, water availability, seeds, farming practice, mechanization of agriculture, compost/ farmyard manure (FYM), and application of pesticides (see image 7). At the end of the diagramming the workshop facilitators asked also for the estimation about further developments until 2030 in order to initiate a discussion about a possibly deteriorated agricultural situation in future. This discussion was intended to serve as a base for the tasks in the small groups.

Image 7: *Historical Diagram* - WS 1 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

The most important observations during the realization of the *Historical Diagram* are the following.

- **Positive observations with regard to *Historical Diagram***
 - This tool was conducted in the plenum and thus consensus-building was addressed.
 - There could be observed an animated discussion about living spaces where agriculture changed a lot during the last 60 years. Active exchange about degrees and modes of changes was also observable.
 - The exchange among farmers was enthusiastic since everyone enjoyed being able to contribute a statement. The most participants appreciated having to explain what and how the facilitators should draw on the sheet because this transferred control over the process to the participants.
 - As a result the diagram visualized clearly that there was intense positive change and advancement until the 1990s. Afterwards, the diagram revealed that in many spheres until today negative developments were reported. The farmers realized this with surprise.
 - The tool was very suitable for awareness-rising, for the increase of consciousness about complex interrelations, and for the critical reflection of potentials and threats of modern/ Western technologies.

- **Negative observations with regard to *Historical Diagram***
 - Due to a high number of illiterates in this *workshop group* it was necessary to draw the developments although they theoretically could have been written. For the farmers with a higher level in formal education this was judged as time consuming and boring since the facilitator had to be instructed what to draw and how to draw it. Therefore consensus building in the plenum was required. This procedure additionally prolonged the drawing process.

The second tool that was applied in *workshop 1* of *workshop group 5+6* was the combined *Scenario/ Expectations Matrix* which is described in the following.

- ***Scenario/ Expectations Matrix*** about soil fertility, seed production and farmyard manure (FYM)

The procedure of this tool was similar to the *Expectations Matrix* but with a different time horizon. The participants were separated into small groups and were asked to draw the status quo of the respective topic in future according to their estimation as well as to draw the desired status of the same topic in future (see image 8). This allowed for the comparison of two different scenarios that aimed on the sensitization for the necessity of initiating change. The three above topics for the group work (soil fertility, seed production and FYM) were selected by farmers.

Image 8: Scenario/ Expectations Matrix - WS 1 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

– **Positive observations with regard to *Scenario/ Expectations Matrix***

- This tool was conducted in small groups with medium average exchange between group members.
- In each group soon one member assumed the leadership of the group. One group leader even moved from group to group helping with drawings and comments. This made the participants feel that they are well able to solve problems of comprehension within the groups and without the help of workshop facilitators. Hence, the group's self-confidence could be strengthened.
- The participants judged the tool as an advanced method since the discussion went more into detail. A sensibility for sustainability issues could be observed during the discussion of results of the group works in the plenum.
- Some drawings were funny (with intention by the creator) and caused laughter so that a very relaxed group ambience was created.

– **Negative observations with regard to *Scenario/ Expectations Matrix***

- The working steps had to be explained repeatedly in the small groups.
- At own request one group was given the opportunity to treat the topic 'seed production'. But this topic turned out to be very abstract and difficult to visualize.
- Some farmers shunned taking in hand a pencil and to draw, especially illiterate farmers.

– **General observations**

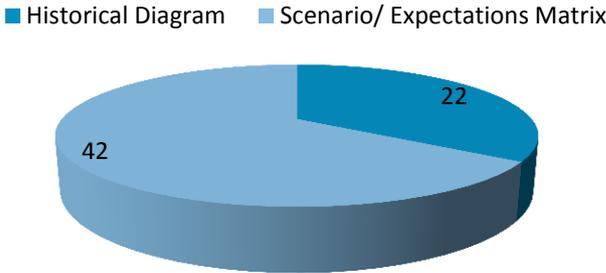
The *Historical Diagram* proved to be a suitable starting tool since every participant was animated and able to give a contribution. The complex causalities and interrelations of

developments in different spheres could be didactically reduced and important issues stuck out clearly (aha-reaction). This was especially the case when the group realized that many developments first improved the livelihoods of 19950s until the 1990s but afterwards, they contributed to a deterioration of today's livelihoods in comparison to livelihoods of the 1950s (e.g. chemical fertilizers or mechanization that decreased today's soil fertility which, in the 1950s, was still estimated as very high even without modern often externally introduced agricultural achievements). It became obvious that today's farmers do not only face more problems but also more severe problems than in former times. This recognition led to an animated discussion about sustainability issues and necessary course corrections in agriculture. In addition, participants could disclose elements which are relevant for agriculture but which are in principle out of farmers' influence (e.g. climate change). On the other side spheres where direct influence is possible stuck out as well (e.g. preserving soil fertility). As a result, the group internalized the individual responsibility for a sensitive human interference with nature.

The proceeding to a discussion of details by working in small groups about scenarios and expectations was appreciated as the participants could directly contribute their own perspective to the debate. The following *points evaluation* illustrates the effects of this potential for individual contribution on the tools' evaluation (see figure 29).

– **Points evaluation at the end of workshop 1**

Figure 29: Points evaluation - WS 1 in WSG 5+6 (Choli and Nimrani non-PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

The group work (*Scenario/ Expectations Matrix*) was definitely judged more positive than the plenary tool (*Historical Diagram*). The participants voiced that this was to be attributed to the potential to contribute one's individual perspectives to the discussion. Content-related causes were not stated.

6.2.2 Workshops 2 (WS 2)

The tools during the *workshops 2* emphasized on experimenting, observing, and evaluating tools. Hence, the tools were arranged with an increasing aspiration level between *workshop 1*, *workshop 2* and *final workshop*¹⁵⁰ as well as according to an advanced familiarity with participatory tools amongst the workshop participants.

6.2.2.1 Workshop 2: workshop group 1+2 (Amlatha and Choli PTD-farmers)

The tools that were realized during the *workshop 2* in *workshop group 1+2* were *Exchange Visit/ Field Visit* with *Observation Matrix* and *Impact Diagram*. In the following, the both tools are more specifically referred to.

– *Exchange Visit/ Field Visit with Observation Matrix*

The Field Visit is a very simple tool since it represents the meeting of participants in the field. It aims on broad exchange of experiences and mutual learning. For the purpose of improving the systematical observation skills of farmers the *Field Visit* was extended with an in situ developed *Observation Matrix* for the evaluation of crop performance. During the visit of a randomly selected farmer's field the participants developed the *Observation Matrix* on the basis of criteria that they had chosen themselves (e.g. color of the plant, growth, pest attack, number of cotton bolls, etc.). The observation matrix was developed by asking open questions. At this, the facilitators started to organize criteria that emerged during the informal discussion of field observations in a matrix according to the treatment sequence. The Matrix developed stepwise and was successively co-developed with the farmers. By help of the *Observation Matrix* different soil treatments of the phosphate rock PTD-research line could be observed and the treatment's performance on crops could be judged. FiBL's phosphate rock PTD-experiment allowed participating farmers to install baby trials on their fields with four equally measured segments. There, out of six possible treatments four treatments of choice were applied for the purpose of directly comparing the performance of crops (see annex 1 for all possible treatments). In the present farmer's baby trial the treatment sequence was **T3** (simple compost) – **T10** (farmer's practice = zero treatment) – **T4** (compost + phosphate rock) – **T6** (compost + phosphate rock + PSB = *Phosphorous Solubilizing Bacteria*)

Once the development of the *Observation Matrix* was finished the farmers went individually from one baby trial segment to the other and evaluated the performance of the crop according to the listed criteria (see image 9). After a break, the results were carried together in the plenum and observations could be visualized. A positive performance with

¹⁵⁰ This applied to the PTD-farmers group, i.e. to *basic groups 1-4*. The control group of non-PTD farmers did not experience an additional more advanced tool during the *final workshop* since the *final workshop* of the non-PTD farmers encompassed only the summarized evaluation of all applied tools during *workshop 1* and *workshop 2* by means of *points evaluation*.

regard to a specific criterion was marked with an addition symbol, negative performance with a minus sign (at the right margin of the matrix). In this way the treatment that was judged best with regard to the crop performance stuck out clearly since it recorded not a single minus sign. Additionally, the plus and minus signs were counted and contrasted in numbers (left margin of the matrix). At a glance, it became clear that **T6** (compost + phosphate rock) performed best, followed by **T4** (compost + rock phosphate). The zero treatment practice (**T10**) was evaluated as worse treatment with the less beneficial effects on the crop performance (see image 10).

Image 9: Exchange Visit/ Field Visit - WS 2 in WSG 1+2 (Amlatha and Choli PTD-farmers)



Source: ZAHUMENSKY 2010

Image 10: Observation Matrix - WS 2 in WSG 1+2 (Amlatha and Choli PTD-farmers)



Source: ZAHUMENSKY 2010

Other observations refer less to the outcomes but rather on the evaluation of processes during the tool's application. These observations are listed below.

- **Positive observations regarding *Exchange Visit/ Field Visit and Observation Matrix***
 - This tool was conducted in the plenum, thus participants could make observations individually and/ or discuss them with other farmers. The farmers' participation and exchange were partially very high.
 - The participants appreciated a lot being on the field and being able to make direct observations.
 - The participants showed excellent specific and detailed observation skills. They enjoyed being able to display their professional knowledge in front of researchers. The research staff could also learn from farmers' skills since the researchers' attention was called on observation criteria that to date have not been considered by them.

- **Negative observations regarding *Exchange Visit/ Field Visit and Observation Matrix***
 - Conducting the tool was challenging for the Indian co-facilitator. Hence, the visualization was confused. Once the co-facilitator had a more precise notion of the matrix it became also clearer for the farmers. At the end, everybody understood the matrix so that it could be used efficiently.
 - Due to the lack of practice and difficult imagination of the matrix's systematic it was difficult to ask *open* questions in order to collect observations without giving direction.
 - During the individual field observation some farmers did almost not participate. This was also attributable to the blazing heat on the field (farmers informed that they felt very uncomfortable due to the heat).

Subsequent to the *Field Visit* there was conducted an *Impact Diagram* that aimed on the summarization of impacts of the observed treatments.

– ***Impact Diagram***

The *Impact Diagram* is a simple tool that contrasts positive and negative impacts of a topic. The participants can work in small groups and are asked to list positive and negative impacts. The length of the list clearly visualizes whether the positive impacts outweigh the negative impacts or vice versa. This tool was also selected in order to offer a group work after the plenary tool since the case study's evaluation of PTD-tools included the evaluation of tool forms.

For the implementation of the *Impact Diagram* in *workshop group 1+2* the participants were split into six small groups and each group was asked to contrast advantages and disadvantages of a specific PTD-treatment. In the below presented case (image 11) the treatment was compost with rock phosphate, PSB and acid tamarind solution.

The listing on the positive side prevailed as in the most cases since all treatments proved to have better effects on crop performance than the usual farmer's practice ('zero treatment').

Image 11: Impact Diagram - WS 2 in WSG 1+2 (Amlatha and Choli PTD-farmers)



Source: ZAHUMENSKY 2010

Further positive and negative observations during the tool's application are summarized in the following. The *points evaluation* at the end of *workshop 2* in *workshop group 1+2* discloses a clear tool preference.

– **Positive observations with regard to *Impact Diagram***

- This tool was conducted in small groups. Yet, there was little exchange and discussion within the groups. From the beginning the participants were mainly busy with writing. Upon request they explained that there was immediate consensus about the advantages and disadvantages of the respective treatment, and hence, there was no need for discussion.
- In this group there were only literate participants so that the tool could be realized by writing.
- The participants enjoyed much more the presentation of the results of the small groups than working out results. They realized that the tool served as synopsis of the previous tool and that the workshop was going to be finished. During the group work presentations the participants valued their today's performances under exhausting field conditions with enthusiastic applause.

– **Negative observations with regard to *Impact Diagram***

- Very soon the working steps have been clear for the participants with the result that they felt unchallenged and bored

– **General observations**

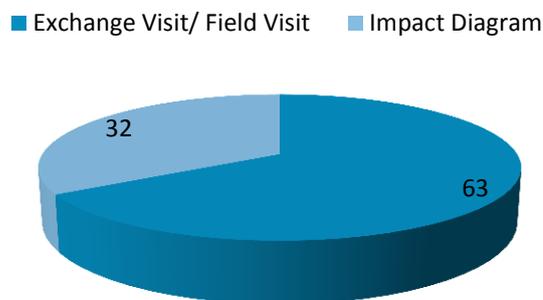
During the *Exchange/ Field Visit* the participants compared their observations of the crop performance with observations on their own PTD-baby trials. There was a very high demand for visiting the own field with all the other farmers in order to discuss the own observations and to exchange specific manifestations of crop performance on the own field. The *Field Visit* disclosed that farmers cherish practical learning and exchange in the field, as well as it disclosed different observations which the members of the research team would not have had observed.

The *Impact Diagram* led to a general discussion about future possible PTD-treatments with which the following PTD-cycle could continue experimenting. The basis for a PTD-follow-up was built as well as the experimenting character of the PTD-project in general stuck out very clearly. The participants could be successfully sensitized for their pro-active role and responsibility as researchers and agricultural experts, as well as they could discover a scope of influence on the PTD-research design.

The *points evaluation* at the end of *workshop 1* gives evidence to the popularity of *Field Visits*.

– **Points evaluation at the end of workshop 2**

Figure 20: Points evaluation - WS 2 in WSG 1+2 (Amlatha and Choli PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

The participants definitely gave preference to the *Field Visit* with *Observations Matrix*. The farmers voiced that in the field they feel free and thus they are able to relax and open their minds even for difficult tasks. Moreover, the participants had a strong demand on immediately visiting all farmers' fields since some farmers interposed observations in comparison to own crop performances. This made other farmers very curious as they wanted to see and compare the reported observations. Some kind of competition could be felt regarding who is going to have the best performing crops among all PTD-farmers. In

contrast, the *Impact Diagram* was judged boring since there was nothing new to discover or to observe. This tool rather served for the summarization of results.

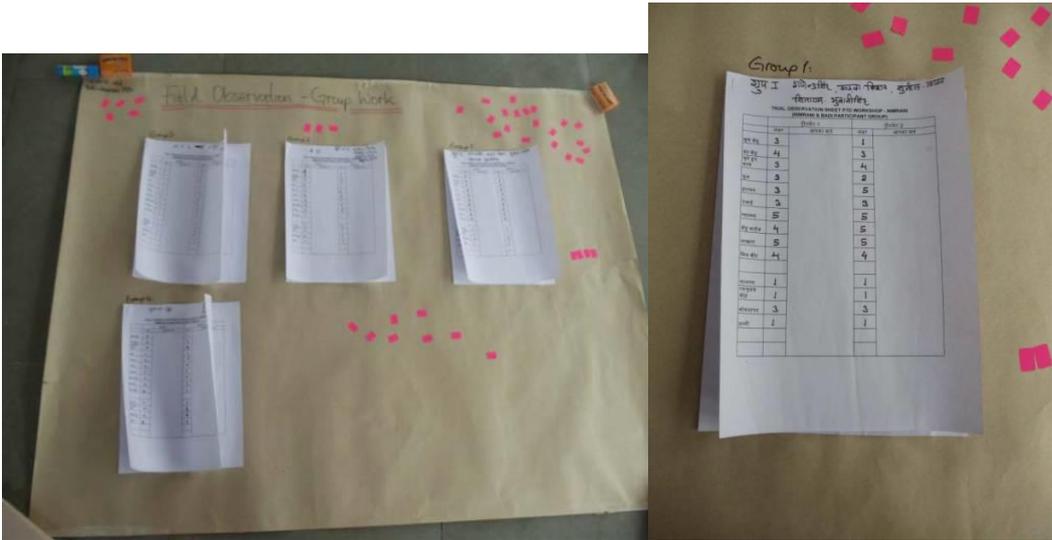
6.2.2.2 Workshop 2: workshop group 3+4 (Badi and Nimrani PTD-farmers)

The *workshop 2* of *workshop group 3+4* encompassed also a *Field Visit* that was conducted in small groups (*Group Field Observation*). Furthermore, a *Matrix Ranking* was realized in the plenum.

– **Group Field Observation (with Observation Sheet)**

During *workshop 1* in this *workshop group* criteria for the observation of crop performances were developed for the purpose to work out an observation check list during an upcoming *Field Visit* in the course of *workshop 2*. The criteria have been elaborated and extended by the facilitators in consultation of the Indian FiBL/ bioRe research coordinator (Mr. VERMA). Afterwards, the criteria were listed in a tabular form. In the field the participants were asked to judge the crop performance of each treatment according to each criterion on a scale between 1 and 5 (with 5 being the value for the best performance) (see image 12). Therefore participants were split into small groups in order to discuss their observations. With this tool a quantitative evaluation of treatments on the present baby-trial could be made. These treatments were **T3** (compost) – **T4** (compost + phosphate rock) – **T10** (farmers' practice/ zero treatment) – **T11** (compost + phosphate rock + tamarind acid).

Image 12: Group Field Observation - WS 2 in WSG 3+4 (Badi and Nimrani PTD-farmers)



Source: ZAHUMENSKY 2010

The observations of group dynamics as well as informal information about the evaluation of tools are listed below.

– **Positive observations with regard to *Group Field Observation***

- The tool was conducted in small groups and there was an animated exchange.
- The evaluation of performances in numbers proved to be adequate given that the group featured some illiterate farmers.
- The tool was judged as a practical tool and thus as a suitable method for farmers.
- The participants approved of the observation sheet and could handle it quickly. They enjoyed the process of observing and evaluating very much. Some working groups walked for a long time through the trial segments, evaluated the occurrence of pests, and leaf quality, etc., in every detail, as well as in some working groups there was an animated discussion about the observations. It took some time to bring all working groups together again.
- There was a high satisfaction degree of having contributed to individual judgments and observations about crop performances. The farmers could present their professional observation skills.

– **Negative observations with regard to *Group Field Observation***

- None

The subsequent tool was a *Matrix Ranking* on the base of the data that was assessed shortly before in the field. The objectives of the ranking were to summarize the group works and to rank the treatments according to their effects on crop performance. In the following the *Matrix Ranking* is addressed in more detail

– ***Matrix Ranking***

The general procedure of a *Matrix Ranking* was already explained elsewhere. In the present case the observed treatments were lined up in columns and the observation criteria in rows whereupon a matrix was drawn, i.e. the observation sheet was transformed into a matrix. Afterwards, the respective group scores were inquired, summarized and entered into the empty spaces of the matrix. Image 13 shows the results of the *Matrix Ranking*

Image 13: Matrix Ranking - WS 2 in WSG 3+4 (Badi and Nimrani PTD-farmers)

	T1	T2	T3	T4
सुपुके	8	5	8	10
जद डोड	18	14	13	15
दुने काले	10	14	12	11
फुन	6	5	6	8
हरापन	11	14	11	12
अचडे	14	16	18	19
स्वारथ्य	15	17	17	14
वेड साईज	15	17	14	15
शाखाए	16	19	19	19
मिन्कोट	8	7	7	7
जोलापन	6	6	8	6
रसचुम्ब	7	4	6	6
कोकडापन	11	9	7	8
इन्गी	4	4	4	4

$4 = 132$ $4 = 151$ $4 = 125$ $4 = 154$

Source: ZAHUMENSKY 2010

The positive and negative observations with respect to the *Matrix Ranking* are addressed below. The *points evaluation* after *workshop 2* in this *workshop group* delivers also clear results which are illustrated afterwards.

– **Positive observations with regard to *Matrix Ranking***

- This tool was conducted in the plenum and therefore all participants were addressed.
- By means of the quantitative judgment (total scores) it was possible to identify the treatment that was supposed to influence the crop performance the most intensively.
- This tool is an advanced tool where treatments could be directly contrasted according to a variety of criteria; the results could be discussed on a high level.
- The farmers appreciated the visualization of the results of their observations through the tool.

– **Negative observations with regard to *Matrix Ranking***

- The summarization of scores from small groups turned out to be very time-consuming and boring for the farmers.
- From time to time a certain leveling of scorings that varied in the small groups became obvious but farmers accepted this generalization as main tendencies in the scoring have not been distorted. The local research coordinator suggested improving the tool through weighing specific criteria differently in order to avoid a distortion of results by simple summarization of scores. Yet, making the tool more complex is accompanied with the risk to turn it less comprehensible. For the researchers it was

more difficult to accept the scientific vagueness of the tool in favor of the procedural outcomes during its application.

– **General observations**

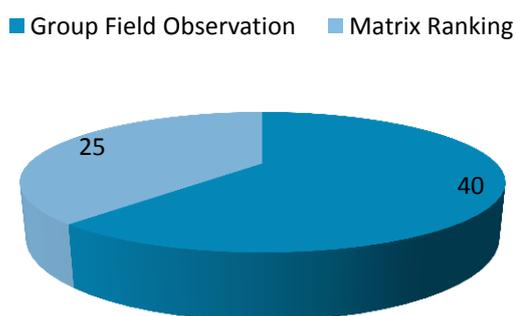
Partially, aha-reactions could be observed once the farmers realized that, at the end, some criteria which they had considered as less important turned out to be important criteria with high total scores. Furthermore, two additional criteria for the observation of treatments were suggested: 'cotton weight' and 'variety'. Starting the workshop with the observation criteria list that had been worked out during *workshop 1* in this *workshop group* was positive because the participants remembered their observation list and identified with the tasks of *workshop 2*.

– **Points evaluation at the end of workshop 2**

The participants definitely gave preference to the *Field Observation* (see figure 31). This tool was very well prepared and elaborated within the PTD-research team as well as it was intensely discussed whether it matches with farmers' thinking. The participants took the observations very seriously and appreciated to contribute their own sight.

During the *Matrix Ranking* farmers voiced that they were indeed interested in a calculation of results and these results have indeed been partially surprising but they preferred the process of observing their crops. This may be due to the security and professionalism they have in observing crops since this is their daily habit.

Figure 21: Points evaluation - WS 2 in WSG 3+4 (Badi and Nimrani PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

6.2.2.3 Workshop 2: workshop group 5+6 (Choli and Nimrani non-PTD-farmers)

In the course of *workshop 2* in *workshop group 5+6* there was applied a *Transect Walk* and an *Impact Diagram*. From methodological viewpoint the tools were selected in

order to offer a plenary tool as well as a method that was applied in working groups for comparison reasons. The both tools are illustrated below

– ***Transect Walk***

The *Transect Walk* is a systematic walk along a defined route (transect) across a selected area together with local people. It serves for exploring local conditions by observing and producing a transect diagram that visualizes the major observations. First of all, the facilitators selected the *Transect Walk* due to the demand of the participants who during *workshop 1* voiced an interest in covering the topic 'cotton varieties'. The tool was intended to serve as a form of *Field Visit*. As the non-PTD group didn't have baby-trials at their disposal the informal PTD-experiment trial about cotton varieties on the bioRe farm was alternatively used. The observation skills in this group were estimated as less experienced since the participants are not participating in the PTD-project. On the informal variety trial equal plots have been sowed with different cotton varieties in order to observe parameters of crop performance such as plant health, yield, and degrees of pest resistance/ pest attacks according to each variety and under equal treatment conditions.

Methodologically, the facilitators initially asked for observation criteria of the first plot. On the basis of the criteria a transect draft was developed in the plenum (see image 14). Afterwards, the following plots were observed and criteria were judged. The *Transect* encompassed drawings of the five trial segments that visualized crop performances (height, color of leaves, weakness of leaves, pest attack and diseases, boll size, number of bolls), as well as the most important observations have been noted (see image 15). This mixture of visualization and writing was chosen due to the mix of literate and illiterate farmers in this group and in order to simplify the comparison of the treatments by the end of the workshop.

Image 14: *Transect Walk* - WS 2 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

Image 15: Outcome of the *Transect Walk* - WS 2 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

During the application of the *Transect Walk* some relevant observations could be made that are listed in the following.

– **Positive observations with regard to *Transect Walk***

- This tool was conducted in the plenum. Hence, consensus building competencies were asked.
- It could be observed that the co-facilitator and participation agent of the local research team showed a high familiarity with participatory methodology. He facilitated this tool confidently.
- The participants disclosed very good observation skills. Every farmer could contribute something.
- Through this tool participants obtained new and specific information about the crop varieties.

– **Negative observations with regard to *Transect Walk***

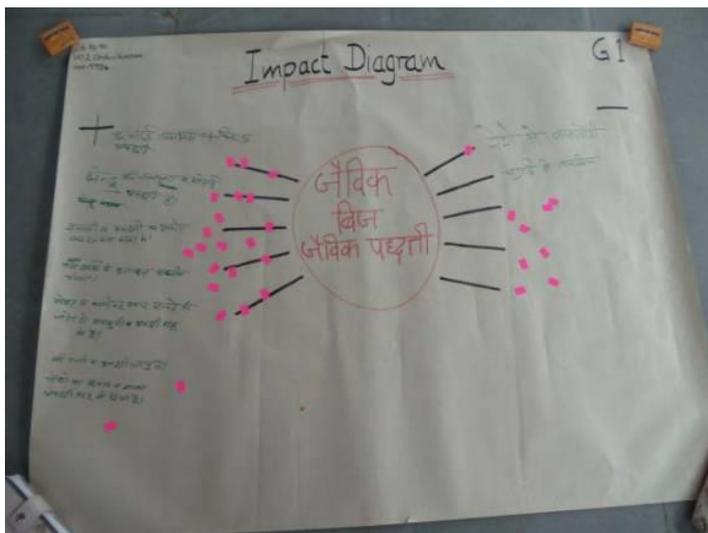
- In the plenum no participant was willing to draw. Thus, the facilitators had to draw even of repeated requesting and encouraging.

The second tool of *workshop 2* in *workshop group 5+6* was the *Impact Diagram*. Its general procedure was already described. Thus, in the following, there will be addressed more detailed and specific observations during its application.

– **Impact Diagram**

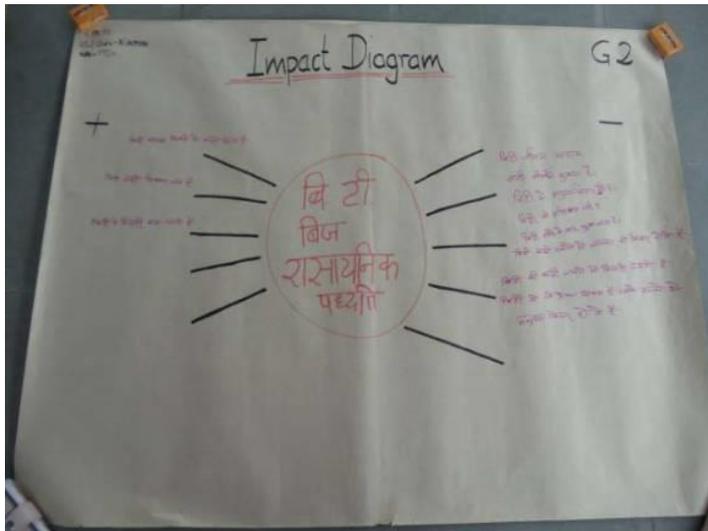
After the *Transect Walk* the group visited the FiBL LTE (*Long-term Farming Systems Comparison Experiment/ Field Trial*) that is situated near the bioRe farm. On the FiBL LTE trial equal trials are located where the performance of different crops are scientifically evaluated under different farming system conditions (biodynamic vs. organic vs. conventional vs. genetically modified). After the participants had been split into small groups they were asked to figure out impacts of conventional and organic cultivation. At first, the small groups were asked to inspect their assigned plot similar to the preceding *Transect Walk*. Later, the groups were asked to discuss positive and negative impacts of the farming system, and to put the results systematically on the paper, respectively. The resulting *Impact Diagram* served for the comparison and clear visualization of differences between the opposing farming systems. Additionally, the predominance of either positive or negative impacts could be captured at a glance as image 16 and 17 illustrate.

Image 16: Impact Diagram 'organic farming' - WS 2 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

Image 17: Impact Diagram 'conventional/ GMO farming' - WS 2 in WSG 5+6 (Choli and Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

– **Positive observations with regard to *Impact Diagram***

- This tool was conducted in small groups. In this way shy participants could also contribute something.
- The participants confirmed that this was a method which the farmers could handle easily. They appreciated contributing their own opinion about conventional and organic farming.
- There was a very animated discussion in the working groups.
- During the presentation of the results of the working groups some participants turned out to be very shy but finally even a very shy illiterate farmer presented the results of his group in one sentence and gained lots of applause for that.

– **Negative observations with regard to *Impact Diagram***

- Some farmers in this group were illiterate what made them shy away from presenting. Obtaining their confidence and encouraging them was very difficult.

– **General observations**

The differences in the performance of cotton varieties according to the observation criteria stuck out clearly during the *Transect Walk* with the result that crop performances could be contrasted and discussed. A basis for the spirit of experimentation and the way of observing experiments was built among the farmers.

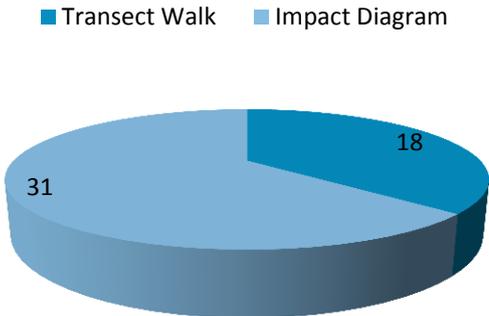
The *Impact Diagram* visualized very clearly the negative impacts of conventional and positive impacts of organic farming. The listing of positive and negative impacts showed distinct results on the respective listing side (plus and minus signs). The *points evaluation* at

the end of workshop 2 in *workshop group* 5+6 revealed a clear tool preference as it is illustrated in figure 32.

– **Points evaluation at the end of workshop 2**

Although the requested topic of cotton varieties was addressed in the *Transect Walk* participants preferred the *Impact Diagram* (see figure 32). This group voiced that they generally prefer working in small groups discussing the topic with which they are more familiar, i.e. the comparison of conventional and organic farming systems. Besides, every single farmer was asked to actively note results and to draw during the work in small groups. This aspect was judged as positive. As opposed to this, in the plenum the participants remained shy and unwilling to draw.

Figure 32: Points evaluation - WS 2 in WSG 5+6 (Choli and Nimrani non-PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

6.2.3 Final workshops (FWS)

The *final workshops* rounded out the workshop phase. For the PTD-farmers there was applied one final tool that intended to summarize PTD-relevant topics, to increase the overview about components of the PTD-research and their interrelatedness, as well as to offer a platform for broad exchange of all PTD-farmers (see PTD-exposition). For the non-PTD-farmers there was not conducted an additional final tool. Yet, all investigated farmers (PTD and non-PTD) were asked to evaluate the experienced PTD-tools a second time. This served for the cross-checking of evaluations and the identification of possible variations in the scoring.

6.2.3.1 Final workshop: workshop groups 1 - 4 (all PTD-farmers)

– PTD-Exposition

The exposition served for the meeting of all PTD-farmers of the four villages under investigation. Through the PTD-exposition it was intended to offer a platform for broad exchange and discussion about experiences across all village borders as well as for the purpose of increasing the team spirit amongst PTD-farmers. Through the meeting they were ought to realize that they are quite a large number of farmers who together can move an issue forward once they show commitment.

For the exposition four tables with information boards were arranged in a roofed common area of the bioRe farm. The farmers had time to bat around the exposition and to stop at the table of interest or to discuss exhibits (see image 18). On the information boards motives, components and milestones of the PTD-research were illustrated in a summarized form (problems of monoculture, sustainability issues, organic techniques such as herbal pesticides, the comparison of organic and conventional farming practices, comments on the comparison of the PTD-on-farm experiment component and the PTD-validation trial component; additionally the boards addressed participatory philosophy and knowledge in the context of the PTD-on-farm research).

Image 18: PTD-Exposition - Final workshop in WSG 1 - 4 (all PTD-farmers)



Source: ZAHUMENSKY 2010

For the purpose of illustrating monoculture and the resulting decrease in soil fertility, yield and crop quality a table was arranged with small mung bean bags from the FiBL-LTE field trial that have been treated with the different PTD-treatments. This information board aimed at conveying the idea of being able to directly and visibly influence soil fertility and crop quality by application of locally, self-developed organic soil treatments. Actually, one could recognize distinct variances in the seed quantity and quality of the mung bean packages according to the different organic PTD-treatments. Another table showed different bags of cotton bolls. Their performance could also be analyzed according to

different farming systems (conventional vs. organic farming systems). Visible differences in boll quality, size, number and fiber quality became apparent.

Moreover, the farmers were ought to recognize and to internalize specific PTD-key concepts that have been addressed and discussed during the preceding workshops. Thus, a crossword puzzle was developed in order to sensitize farmers for the interrelated key words (1. monoculture, 2. sustainable, 3. comparison, 4. experiment, 5. participation, 6. knowledge). The crossword puzzle had to be solved in small groups where farmers of the both villages *Choli* and *Amlatha* have been separated by intention since they already used to have a great affinity to each other during the previous workshops. Hence, a mixture of the more distant villages *Choli/ Nimrani* and *Amlatha/ Badi* was intended during the group work in order to expanse the exchange among all PTD-farmers. This was also meant to mix PTD-experienced farmers of *Amlatha* and *Choli* with PTD-inexperienced farmers of *Badi* and *Nimrani*.

– General observations

Already before the beginning of the exhibition most farmers were very curious about the 'final tool'¹⁵¹. According to them they accepted the exhibition excellently since it based on a voluntary participation base and everybody could select the topic of individual interest. The farmers even voiced that they felt stronger when they met other peers. Moreover, they appreciated very much the platform of exchange with a large number of peers.

In general, the group dynamics and exchange were very intense in this *final workshop* with all PTD-farmers. The participants even forgot about lunch during an animated group discussion and they showed a very high interest in cotton varieties: they virtually absorbed information about this topic that was given by the co-facilitator upon request. Furthermore, discussing tangible PTD-results at the exhibition tables and summarizing key information on the information boards (observations of crop performances of mung bean and cotton bolls, as well as information about organic techniques of pest defense such as herbs or leaves) turned out to be very good means for carrying the group as well as for giving an impulse for sustainable awareness rising and motivation for more committed participation in the PTD-experiment.

Furthermore, it proved to be appropriate to have had prepared an information board that compared the validation component with the PTD-on-farm experiment

¹⁵¹ Basically, the PTD-exhibition can be considered as a form of group discussion that could have been evaluated in the context of the case study. In order to maintain equal numbers of tools in both the group of investigation (all PTD-farmers) and the control group (all non-PTD-farmers) the exhibition as a participatory tool was ignored in the participatory *points evaluation*. The other option of also realizing an exhibition for the control group was supposed to be inappropriate. Actually, it was apparent that the application of an additional final tool in the control group would not have been successfully since the interest in a *final workshop* within this group was low.

component since the majority of farmers did not know of the validation-trials. Meanwhile, those are very important for the dissemination of a critical reflection and the comparison of organic and conventional farming systems on conventional farmers' fields.¹⁵²

One unexpected observation was that the planned mixture of PTD-experienced and PTD-inexperienced farmers did not take place in the desired manner. Actually, participants of the villages *Badi* and *Nimrani* (PTD-inexperienced) showed a very high interest in information gathering as well as critical awareness. However, while the *Choli* and *Amlatha* farmers (PTD-experienced) were very keen on active exchange the PTD-inexperienced farmers behaved rather quiet and listening probably due to their higher interest in information gathering.

Apart from that, the co-facilitator excellently passed this last practical participatory training test. He had the control over the processes, showed a high familiarity with participatory methodology, had a very clear position and voice in front of the farmers and one could observe that he was definitely accepted as the chief participation expert of the FiBL/ bioRe PTD-research team. By the end of the *final workshops* it was clear that his basic training in participatory working was successfully finished.

As already mentioned above, the *final workshops* closed with a second *points evaluation* of the applied participatory tools. The *points evaluations* after each *workshop 1* and *workshop 2* ('separated' *points evaluation*) were intended to be compared to the final *points evaluation* of all tools ('summarized' *points evaluation*). In the following, the both evaluation forms will be compared.

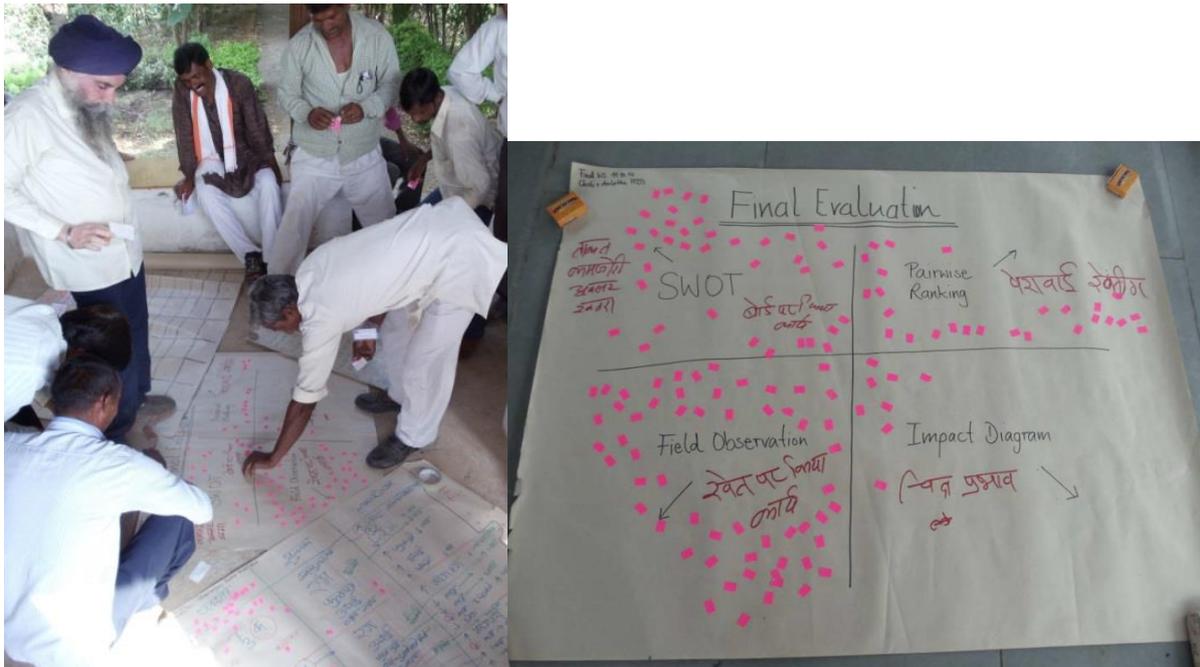
– **Comparison of 'summarized' vs. 'separated' *points evaluation* at the end of the FWS (workshop group 1+2: *Amlatha* and *Choli* PTD-farmers)**

By the end of the *final workshop* of all PTD-farmers (PTD-exhibition) a summarized evaluation of all applied tools was realized. With this repeated evaluation the author aimed at retracing possible scoring variances due to the synoptic overview and the enlarged basis for comparison of the tools. It is assumed that the evaluation can take place more distinct with an increased experience in participatory tools. Above all, it was assured that only the *workshop groups* who had experienced the tools of the respective evaluation round gave their voice. Hence, the big group of the *final workshop* of the PTD-farmers was separated again into the respective *workshop group 1+2* and *workshop group 3+4*. Afterwards, the

¹⁵² Validation trials are small trials that are located on conventional farmers' fields. In the baby trials, organic techniques are used. The crop performance under organic farming techniques can be directly compared to the surrounding crop performance under conventional farming management. The validation trials are non-participative since the conventional farmers only provide a part of their parcel. Yet, they can stimulate observing crop performances under different treatment conditions and thus, they can initiate a process of critical awareness and the reflection whether organic techniques can be an alternative to conventional techniques.

evaluation sheet was laid down on the floor while the sheets of all four tools that have been applied during WS 1 and WS 2 (in the case of group work there was chosen one sheet as representative) were arranged at the four corners of the evaluation sheet. Similar to the previous evaluations the participants gave their voting by sticking self-adhesive points on the evaluation sheet (*points evaluation*) (see image 19).

Image 19: Points evaluation and results - Final workshop in WSG 1+2 (Amlatha and Choli PTD-farmers)



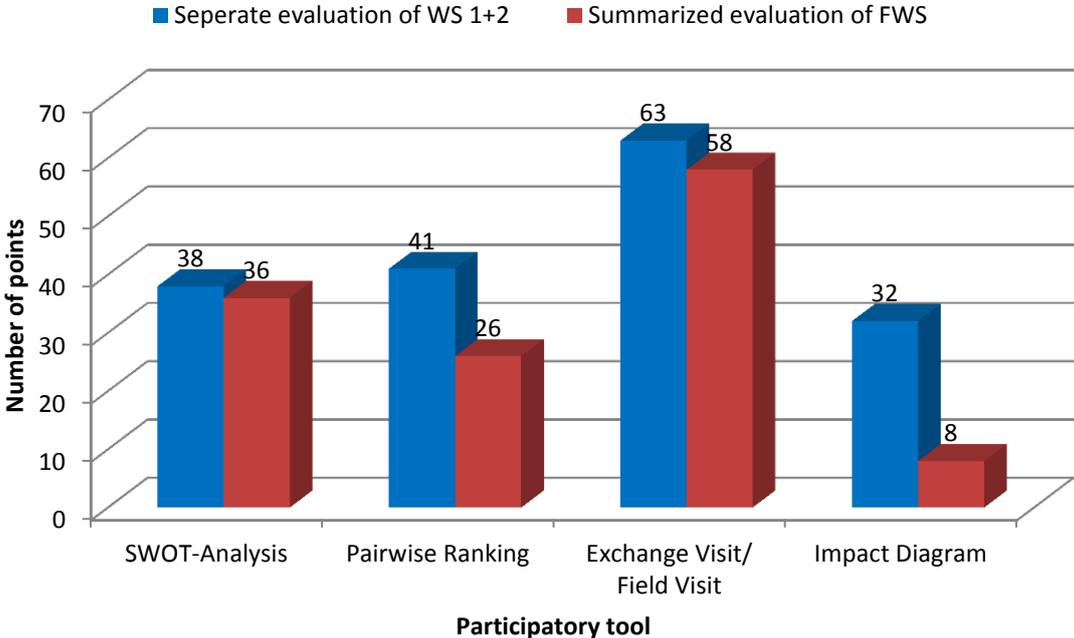
Source: ZAHUMENSKY 2010

At a glance, the *Field Observation/ Exchange Visit* and *SWOT-Analysis* were dominant favorites in the group of *Choli* and *Amlatha* PTD-farmers. The practical (*Field Visit*) and more abstract-analytical tool (*SWOT-Analysis*) were judged as more appropriate to this farmers group that was assumed to be the most active, most advanced, and most PTD-experienced group. The already indicated disadvantages of *Pairwise Ranking* (exhausting and boring procedure of comparing) and *Impact Diagram* (mental underload and already known findings) prevailed in the final summarized evaluation of this group.

The high scoring and high appreciation of advanced tools are confirmed through informal observations during all workshops that underline rather a mental underload than overcharge in this *workshop group*. This is also indicated by the fact that discussions amongst the *Choli* and *Amlatha* farmers generally have been very animated, intense exchange has taken place, lots of questions have been asked and critical questions came up, as well as an advanced experimenting spirit among the participants could be observed. Besides, the observation skills of the farmers in this group were excellent.

Summarized, there cannot be reported huge variances in the 'separate' scoring after each *workshop 1* and *2* and in the 'summarized' scoring after the *final workshop* (see figure 33). Although a significant loss in total points has to be reported at the final summarized evaluation (-46 in number) the main scoring tendencies persisted while the participants only showed more decisive favoritism of the practical and analytical tools. The most losses of evaluation points had to be reported for *Impact Diagram*, the tool that has been judged as boring and demanding too little from the participants

Figure 33: Comparison of points evaluations - Final workshop in WSG 1+2 (Amlatha and Choli PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2013

– **Comparison of 'summarized' vs. 'separate' points evaluation at the end of the FWS (workshop group 3+4: Badi and Nimrani PTD-farmers)**

In this group the final *points evaluation* took place in exactly the same way as it was realized with the *Choli* and *Amlatha* PTD-farmers. The evaluation sheet was laid down on the floor while the sheets of the tools were arranged at the four corners of the evaluation sheet. Afterwards, the participants were asked to give their voting while comparing preferences and dislikes of the tools that have been applied during WS 1 and 2 (see image 20).

Image 20: Points evaluation and results - Final workshop in WSG 3+4 (Badi and Nimrani PTD-farmers)

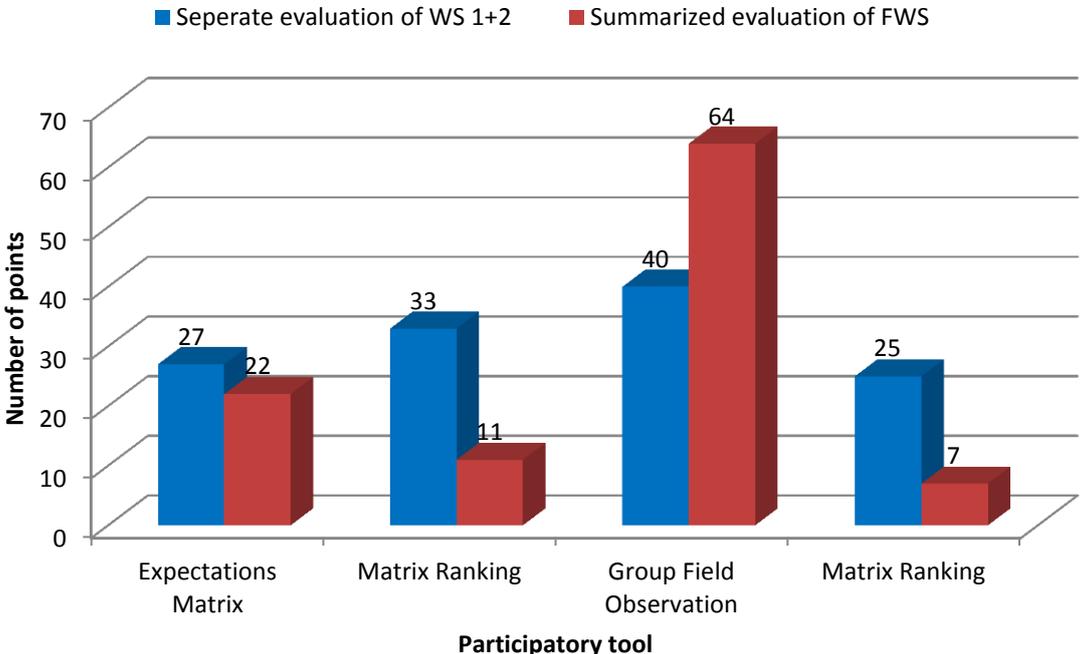


Source: ZAHUMENSKY 2010

At comparing the total points of the *points evaluations* in WS 1 and 2 and in the FWS in this group (see figure 34) a decrease in total points (-21 in number) had also to be reported. In sum, there can be observed more distinct scoring variations during the separated and summarized evaluation with the result that the preference of one tool stuck out even more clearly than in the summarized evaluation of *Choli* and *Amlatha* PTD-farmers. By far, the *Group Field Observation (Field Visit)* was definitely preferred from most participants. During the *Field Observation* it became clear that the observation and analyzing skills of the farmers from *Badi* and *Nimrani* villages were as excellent as the observation skills of the farmers from *Choli* and *Amlatha* villages. This explains the high appreciation of the observation tool that remained almost without alternative regarding the tools' aspiration levels.

The both *Matrix Rankings* experienced negative judgment and showed the most absolute losses of points at the summarized evaluation (-22 points and -18 points). Furthermore, in this group a shift in the preference of one tool can be reported. During the separate evaluation *Matrix Ranking* was still the second-placed tool with regard to the popularity rating. In the summarized evaluation the tool that was conducted in working groups (*Expectations Matrix*) was ranked in the second place instead.

Figure 34: Comparison of *points evaluation - Final workshop* in WSG 3+4 (Badi and Nimrani PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2013

– **General observations at the end of the *final workshop* (all PTD-farmers)**

Summarized, it can be stated that among all PTD-farmers of the four villages and in both evaluation forms, 'separated' and 'summarized' evaluation, *Field Visit* was the clear winner. The second-placed tools on the scale of popularity were the analytical tool on meta-level (*SWOT-Analysis*) as well as the tool that emphasized working on future visions and individual needs of the farmers (*Expectations Matrix*).

With regard to the evaluation of PTD-tools in the context of the case study there can be made some final recommendations regarding the selection of adequate tool for the purpose to increase PTD-farmers' motivation for participation in the PTD-project. If the stimulation of motivation for participation of the PTD-farmers is strived there should frequently be conducted practical PTD-tools that take place on farmers' fields since farmers feel most comfortable in the field. The more comfortable the participants feel the more honestly they will participate and actively contribute to the generation of innovative organic farming technologies. In addition, the participatory practice in the FiBL/ bioRe PTD-project should try to unite all PTD-farmers in regular intervals in order to offer a platform for broad exchange of all PTD-farmers. Besides, the meeting of peers increases the group cohesion and can be motivating per se.

Furthermore, it should be avoided to underrate the PTD-farmers' observing and analyzing skills since unchallenging tools will bore the participants and thus they will have negative effects on farmers' motivation for participation. Retrospectively, it can be stated that a *Flow Diagram*¹⁵³ would surely not overcharge farmers' skills although it might overcharge the facilitator's skills at applying the tool. Hence, another crucial recommendation is to train more participation agents because only skilled facilitators can recognize if a tool is inadequate and can spontaneously react by modifying the tool.

Finally, with regard to the tools' topics it seems to be crucial to work on farmers' individual needs and desires in order to stimulate their pro-active participation. Thereby, forward-looking issues are by no means uninteresting topics for farmers. Hence, local sustainability issues are indeed topics that can and should frequently be addressed for stimulation purposes. Furthermore, *Rankings* should only be applied if they are short and if they are really necessary in order to obtain criteria and less for the purpose of ranking topics per se. In general, the procedure of a *Ranking* is rather perceived as waste of time.

The starting points for the motivation for participation of non-PTD-farmers differ from the above starting points. The final workshop and results of the non-PTD-farmers groups are addressed in the following.

6.2.3.2 Final workshop: workshop groups 5+6 (control group of Choli and Nimrani non-PTD-farmers)

The control group of non-PTD-farmers was built for cross checking purposes primarily with respect to the *points evaluation* as well as for contrasting results of the standardized questionnaire about motivation. Hence, gaining detailed insights into group properties of the control group was not explicitly pursued. For this reason as well as due to an estimated low acceptance of an additional final tool, it was not foreseen to apply an additional tool beyond the *points evaluation* in the *final workshop*. Due to statistical reasons the final *points evaluations* took place separately in each village although all non-PTD-farmers had experienced the same tools.

In general, the participation in the control group was disrupted. It was already mentioned that before the beginning of *workshop 1* the facilitators already reacted on a general low participation degree within *workshop group 5* and *workshop group 6* by merging the non-PTD-farmers *workshop groups* of *Choli* and *Nimrani* to one group during *WS 1* and *WS 2*. In the *final workshop* very few farmers of each village theoretically could participate in the final *points evaluation*. Reasons for that were that some participants absented one of

¹⁵³ *Flow Diagrams* are used to visualize activities, processes or inputs and outcomes in order to describe stepwise solutions of a problem, workflows, or movements, etc. This kind of diagram can become very complex while demanding abstract imaginative power. Hence, it can be considered as a very advanced participatory tool that requires a skilled facilitator.

the workshops or missed at least one tool. In the end, only two farmers of each village were present at the final evaluation and fulfilled the criteria to give a valid scoring of tools. Thus, the following *points evaluations* and remarks on them cannot be representative but rather give an idea about methodological preferences in the control group.

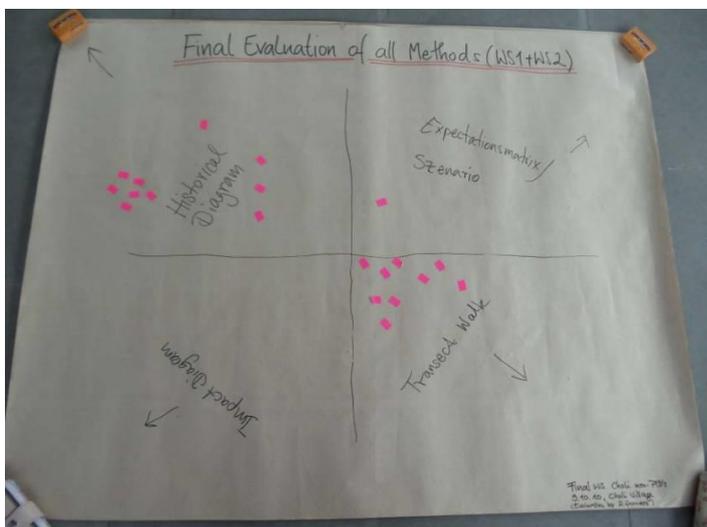
– **Comparison of 'summarized' vs. 'separate' *points evaluation* at the end of the FWS (workshop groups 5+6: Choli and Nimrani non-PTD-farmers)**

Similar to the previous final evaluations all tools were arranged in the corners of the evaluation sheet in order to recall the procedure and results of the tools. The present participants were asked to stick self-adhesive points in the region of the tool of individual preference. As in the previous evaluations the workshop facilitators asked the participants to judge the tools as objectively as possible according to the tools' process and outcomes.

– **Workshop group 5: Choli non-PTD-farmers**

The scoring showed a clear preference of the tools that were conducted in the plenum; those are namely *Historical Diagram* and *Transect Walk*. (see image 21) The other tools that took place in working groups (*Expectations Matrix/ Scenario* and *Impact Diagram*) lack far behind.

Image 21: *Points evaluation* - Final workshop in WSG 5 (Choli non-PTD-farmers)



Source: ZAHUMENSKY 2010

The two participants of the evaluation round informed that they preferred the plenary tools because those treated more complex topics and included a variety of thoughts of the other participants. They liked that on the base of diverse topics of the plenary tools they were able to select the topics of most interest. As a consequence, they estimated the degree of control about the tool's outcome as elevated in comparison to the tools that were

applied in working groups. The participants admitted that the latter have not been boring but they stated that there was less exchange during the tools that were conducted in small groups.

Especially the *Impact Diagram* was judged negatively because one participant did not like the treated topic. He informed that since he is a convinced organic farmer he did not like to be concerned with advantages and disadvantages of conventional or genetically modified farming techniques. As a result he disliked the tool.

– **Workshop group 6: Nimrani non-PTD-farmers**

Ultimately, the evaluation in this participant group is also not representative, but as will be illustrated in the following particular observations of participant behavior and decision-making are insightful and very helpful for the general assessment of the participatory evaluations of PTD-tools in all participant groups. Image 22 illustrates the evaluation process in *workshop group 6* as well as the results of the final summarized *points evaluation*.

Image 22: Points evaluation and results - Final workshop in WSG 6 (Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2010

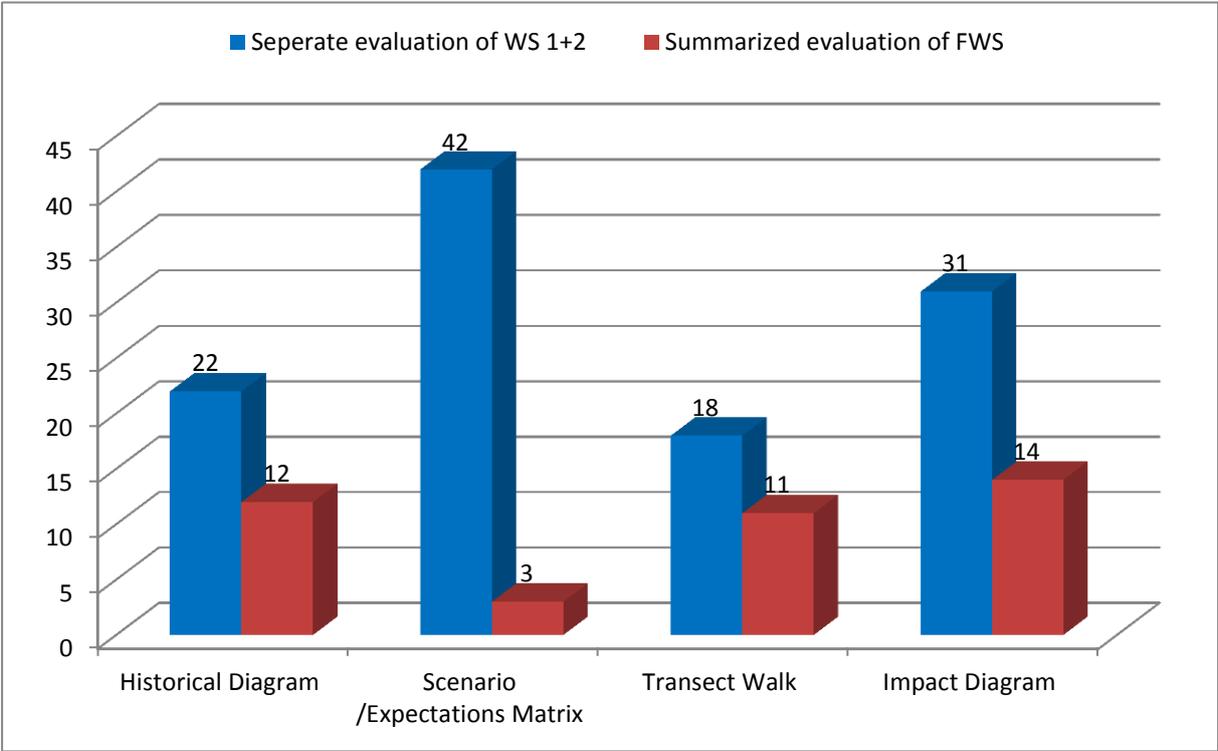
The evaluation of the two farmers of this participant group differed from the previous evaluation of *Choli* non-PTD-farmers. Here, the *Impact Diagram* that remained without a single score amongst the *Choli* non-PTD-farmers received the highest score amongst *Nimrani* non-PTD-farmers while the remaining tools were each given equivalent evaluation points (see image 22). The facilitators could observe that one participant gave all available points to the *Impact Diagram* while the other one gave four points to the *Impact Diagram* and two to each of the other tools. Hence, the evaluation behavior differed much so that a representative interpretation seems impossible to be done.

– **General observations**

There is one point of reference for the interpretation of scorings in the non-PTD-farmers group. In contrast to the PTD-group the valuation standard for the preference of tools seems to refer less to the level of advance of the tools and the respective content-related aspiration level within the farmers group but rather to the question whether the non-PTD-farmers prefer working in small groups or in the plenum. The *Choli* non-PTD-farmers group seems to prefer the plenary tools for the already mentioned reasons of increased diversity and exchange through the inclusion of more complex topics and the variety of thoughts. The *Nimrani* non-PTD-farmers that were present at the final evaluation informed that they preferred working in small groups and that they liked the presentation of group results in the plenum. According to the latter, they obtained the most information during the *Impact Diagram*.

The both final *points evaluations* of *Choli* and *Nimrani* non-PTD-farmers that took place separately for logistic reasons were added up again and are illustrated in the following (see figure 35). Since the final evaluation reported an enormous loss of participants and evaluation points (-93 points in number) the summarized evaluation is hardly interpretable and hence, the derivation of general tendencies remains difficult.

Figure 35: Comparison points evaluation - Final workshop in WSG 5+6 (*Choli* and *Nimrani* non-PTD-farmers) (Number of points)



Source: ZAHUMENSKY 2010

In sum, the non-PTD group showed a reverse scoring with reference to one tool (*Expectations Matrix/ Scenario*) (see figure 35). While this tool was clearly preferred during the separate evaluation it was ranked the lowest in the summarized evaluation. As far as general statements can be made the main tendencies of scoring of the other tools prevailed although there can be observed a certain leveling of scores.

All non-PTD-farmers accentuated that they would like to continue with working with participatory methods in order to intensify and to strengthen the communication between researchers and practitioners. The participants enjoyed presenting results of the group work in the plenum since they consider this as personal benefit. They accept the disadvantageous time-consumption of participatory tools for exchange purposes with other farmers. The participants additionally informed that after having experienced participatory tools for the first time they worked up curiosity about the PTD-project and experimentation with organic techniques as well as they are all the more interested in receiving more information about organic farming techniques in future. The final evaluation gives no evidence about a preference of the *Field Visit* since the *Transect Walk* as a form of *Field Visit* was judged rather negatively in both separate and summarized evaluation.

Nevertheless, in the non-PTD group there could also be observed an increased awareness of complex causalities and interrelations between agriculture and various living spheres, as well as there could be discussed sustainability issues.

Summary Chapter 6.2

In the forefront of the case study, there was the request to select those tools which are most attractive for the target groups and which increase farmers' motivation for participation in the FiBL/ bioRe PTD-project. More information about the preferred tools of farmers could be gathered through the participatory evaluation (*points evaluation*) while more detailed information about motivation aspects will be addressed in the following chapter 6.3.

On the basis of the participatory evaluation of applied tools during the workshop phase of the case study there can be made the following statements. In general, the participating farmers conveyed the impression that they appreciated very much working with participatory tools despite the intense time consumption. Accordingly, the farmers voiced that they would like to continue with participatory practice at bioRe. Likewise, the bioRe extensionists were emphatic about the suitability, acceptance, and the prospect of success of participatory tools for their consulting activities. Actually, it could be observed that the awareness about the experimental character of the PTD-project increased among the target groups as well as the workshop participants recognized the necessity and desirability of their pro-active commitment for experimentation with innovative organic techniques. A sense of ownership as well as a general recognition of the scope of possible control over the PTD-project amongst the participants can be reported.

Considering the estimated potential and definition of participatory tools, the PTD-farmers rather understood the applied methods as tools for exchange and for analysis than as tools for mere information gathering. This notion corresponds to the received information that the PTD-farmers preferred the more voluntary form of information gathering during the PTD-exhibition where they were able to select their topic of interest and the intensity of information. Furthermore, the PTD-farmers repeatedly accentuated the appreciation of possible exchange among peers that they were offered during the workshop phase. In contrast, the non-PTD-farmers accentuated rather the information and content-related learning aspects of the participatory tools. Hence, they rather defined participatory tools as information platform.

With regard to the preference of specific tools it can be stated with certainty that all PTD-farmers by far preferred the *Field Observation/ Field Visit*. Since observing crops is their daily habit the farmers have a high security and professionalism in this regard. Hence, the preference of this tool seemed natural. During the *Field Visits* high exchange rates between peers can be reported. The PTD-farmers generally showed strong group cohesiveness, especially during the final tool of the *final workshop* (PTD-exhibition) even though the mixture of PTD-experienced farmers and PTD-inexperienced farmers did not occur in the desired intensity. Furthermore, the overall valuation standards of the PTD-farmers can be characterized by a high attention that they have given to content-related outcomes which have been worked out by farmers themselves (e.g. findings from the *SWOT-Analysis* or generating a new PTD-topic). Apart from that, the PTD-farmers judged the tools also according to the outcomes on process level (e.g. being given the platform for exchange, recognizing scopes of control and ownership). The control group of non-PTD-farmers rather judged the tools according to the preferred form of application (in the plenum or in working groups).

At comparing the separate with the summarized *points evaluations* there has to be reported a more decisive favoritism of practical tools (*Field Visit*), abstract analytical tools (*SWOT-Analysis*), and the tool where small groups worked on future visions and individual needs of farmers (*Expectations Matrix*). Variances in the both scoring forms (evaluation of participatory tools after each workshop vs. final summarized evaluation of all applied tools) became more apparent in the group with the PTD-inexperienced PTD-farmers of *Badi* and *Nimrani* village. While the separate *points evaluations* in this group revealed a rather balanced scoring the summarized evaluation disclosed a clear dislike of the *Matrix Rankings* that got only distant third and fourth places.

The summarized *points evaluation* of the control group (non-PTD-farmers) is not representative since the separate and the summarized *points evaluations* reveal opposite results. During the final *points evaluation* one participant group stated that they generally prefer working in small groups while the other participant group stated that they definitely preferred the plenary tools. However, there can be highlighted some general tendencies.

The separate evaluation of workshop tools also disclosed a preference of the tools where the farmers had to work in small groups (*Expectations Matrix* and *Impact Diagram*). This adverts to a de facto preference of group work in contrast to plenary tools among the farmers of the control group. Another general observation is that the willingness for participation in this group actually was significant lower than in the group of PTD-farmers since there was a very low number of participants in the *final workshops* of the control group.

Altogether the comparison of separate and summarized *points evaluation* proved to be beneficial since it revealed a more decisive ranking of tools. Hence, the repeated participatory evaluation contributed to the validity of findings¹⁵⁴.

Be the end of the qualitative evaluation of participatory tools there was referred to motivation aspects with regard to an increased participation in the PTD-project. The following chapter 6.3 addresses the quantitative evaluation of participatory tools with a distinct focus on the measurement of motivation degrees.

6.3 Evaluation of motivation degrees (quantitative evaluation)

The participatory evaluation envisaged to gather information about which tools are the most attractive participatory tools for the farmers of the case study. The obtained information about methodological preferences intends to allow for an adequate selection of tools for the PTD-target groups in future participatory processes during the PTD-project. With regard to the case study the participatory evaluation component aimed at answering the concrete aspect of the second research question: which methods are suitable to motivate the farmers for participation in the PTD-project?

The second methodological mainstay of the case study and the complement to the qualitative participatory evaluation is the group-wise measurement of motivation degrees among participants of the participatory workshops with the objective to retrace possible effects of participatory tools on individuals' motivation degrees. This measurement refers to the more general aspect of the second research question: how can farmers be motivated to participate in the PTD-project at all? This aspect implies to go into the matter of whether participatory methods in general have (positive) influence on degrees of general motivation and degrees of motivation for participation in the PTD-project. In connection with this question the quantitative evaluation of participatory tools builds a bridge to the discussion of participation against the background of *post-development* that fundamentally questions the suitability of development efforts. Since participation represents one development paradigm manifestations of participatory practice can be fundamentally questioned as well. Hence, the case study intends to measure whether PTD-tools as representatives of one form

¹⁵⁴ This increased validity does not remedy deficiencies in reliability due to the small sample size, arbitrary group composition, variety of applied tools and problems of comparison, lack of repeatability, etc.

of participatory research practice have effects on the target groups, and if so, which kind of effects they have.

This measurement was undertaken by using a standardized questionnaire that was developed especially for the case study and that can best be characterized by basing on the design of a personality test (the design process of the questionnaire was already illustrated in chapter 5.7.4, for the questionnaire see annex 2). The questionnaire allowed for the calculation of motivation degrees by summarization of scores per question. Variations in motivation degrees were supposed to emerge through the comparison of the measurement of group-wise average motivation degrees before and after the targeted *basic groups* have been exposed to participatory workshops (pre- and post-survey). For the preparation of a data matrix and for general calculations of descriptive statistical values the statistical software IBM SPSS® Statistics Version 19 (2010) was used. The graphic representation of results in form of spider charts happened by means of MICROSOFT EXCEL (2007).¹⁵⁵

In the following the results of the standardized motivation measurement will be presented for each *basic group* and in the sequence the *basic groups* have been arranged in table 8. For each *basic group* the results of the pre- and post-survey will be illustrated and compared in order to disclose group-specific motivational deficits (= low motivation scores in specific motivation facets) and for the revelation of variations in motivation degrees. At doing so the external assessment (questionnaire parts I and II) will be treated at first. The self-evaluation part about basic motivation (questionnaire part III) will succeed and serves for the cross-checking of results of questionnaire part I 'basic motivation'.

6.3.1 External assessment of motivation degrees (questionnaire part I and part II)

The external assessment has been effected through questions about 15 motivation facets during questionnaire part I ('basic motivation' = nine facets) and part II ('motivation for participation in participatory research' = six facets) (for details on the definition of motivation facets see annex 3). While answering the questions it was not evident for the respondents which kind of motivation facet was inquired at the moment. Insofar, this can be designated as external assessment of motivation degrees. In the third questionnaire part ('self-evaluation') the nine facets of basic motivation were briefly explained and a conscious evaluation by farmers about the intensity of each facet of being a driving force for motivation was asked. This can be characterized as self-evaluation.

In a first step the results of the external assessment are systematically compared in the following by means of basic statistical values for each *basic group*, separately for questionnaire part I and part II, as well as before and after the group has experienced participatory methods (pre- and post-survey). Due to the assumed heterogeneity of *basic*

¹⁵⁵ For reasons of the diversity of results as well as for the purpose of clarity much emphasis was put on the most comprehensible visualization of results for any kind of reader. Hence, the author desisted from the representation of expansive statistical tables.

groups the basic statistical values are always specified by help of distribution patterns of scores per *basic group* that are visualized with boxplot diagrams. In a succeeding step main tendencies of motivation degrees are presented by re-generalizing mean scores that were calculated on the base of individual's scores per motivation facet.

The scale of single scores per question ranged from -3 to +3 with +3 representing the score of the highest motivation and -3 representing the score of the lowest motivation of the respondent. Since each facet was assessed by two questions the maximum score of each facet could theoretically reach +6 points and the minimum score of -6 points¹⁵⁶. In general, there can be drawn the analogy that the higher the groups' average score the higher is its average motivation degree. Since in questionnaire part I nine basic motivation facets with each possible +6 or -6 points were inquired the possible range of total points of questionnaire part I theoretically lies between -54 and +54 total points. In the second questionnaire part there were inquired six facets of motivation for participation. Hence, the range of theoretically possible total points in questionnaire part II lies between -36 and +36 total points. The closer the average scores reach +36 or +54 total points the higher is the group's motivation degree.

6.3.1.1 Basic group 1 (Amlatha PTD-farmers)

– Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)

Table 9 shows basic statistical values of the group-wise distribution of total scores in questionnaire part I. At comparing the summarized pre- and post-scores of questionnaire part I *basic group 1* records a mean score of all nine basic motivation facets of +39.8 total points in the pre-survey. After having been exposed to participatory methods the total mean score in basic motivation increased slightly by +0.6 points to an average of +40.4 total points. Looking at the minima and maxima there can be reported a very slight tendency of advance since the minimum of the post-survey supersedes the minimum of the pre-survey. This extends to the maximum. Obviously the range of all measured values has increased by one point and the maximum shifted by one point towards the optimal motivation score of +54 total points. In sum, this group's total mean score of questionnaire part I 'basic motivation' can be considered as high since it lies close to the optimum.

¹⁵⁶ The facets *Experimentation* and *Ownership* of questionnaire part II ('motivation for participation in participatory research') were assessed by one question that was double weighted.

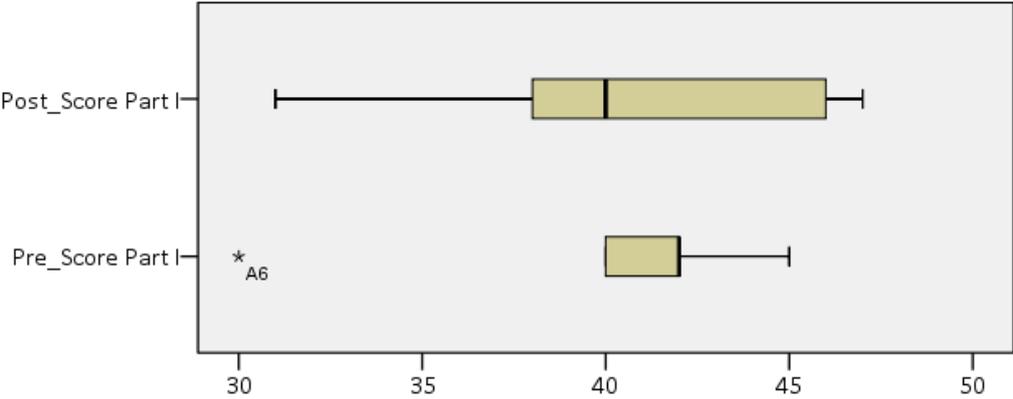
Table 9: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 1* (Amlatha PTD-farmers)

	N	Minimum	Maximum	Mean ¹⁵⁷	Standard Derivation (SD)
Pre_Score Part I	5	30.00	45.00	39.80	5.76
Post_Score Part I	5	31.00	47.00	40.40	6.50

Source: ZAHUMENSKY 2013

Yet, the standard derivation increased in the post-survey. In normally distributed samples the increased standard derivation indicates a broader distribution around the mean value. The following boxplot diagram (figure 36) gives information about the changes in distribution of basic motivation scores in *basic group 1* before and after having experienced participatory tools. Both distributions seem not to be normally distributed since they are not symmetric. Moreover, there is an extreme value in the pre-survey.

Figure 36: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 1* (Amlatha PTD-farmers)



Source: ZAHUMENSKY 2013

The boxplot diagram reveals that there is a small interquartile range (IQR) in the pre-survey (short distance between box borders). That means that in the above case 50% of all measured values lie between +40 and +42 total points. While the maximum of +45 points (upper whisker) is still within the 1.5 times the IQR (1.5*IQR) the minimum of +30 points (farmer ID A6) is qualified as extreme value, i.e. lying outside the 3*IQR so that the actual minimum of the sample lies at +40 points (corresponding to the lower box limit = first quartile). In sum, it is observable that in the pre-survey there is a tendency to a rather narrow distribution of measured values towards the higher motivation scores (right-skewness of the distribution).

¹⁵⁷ Arithmetic mean

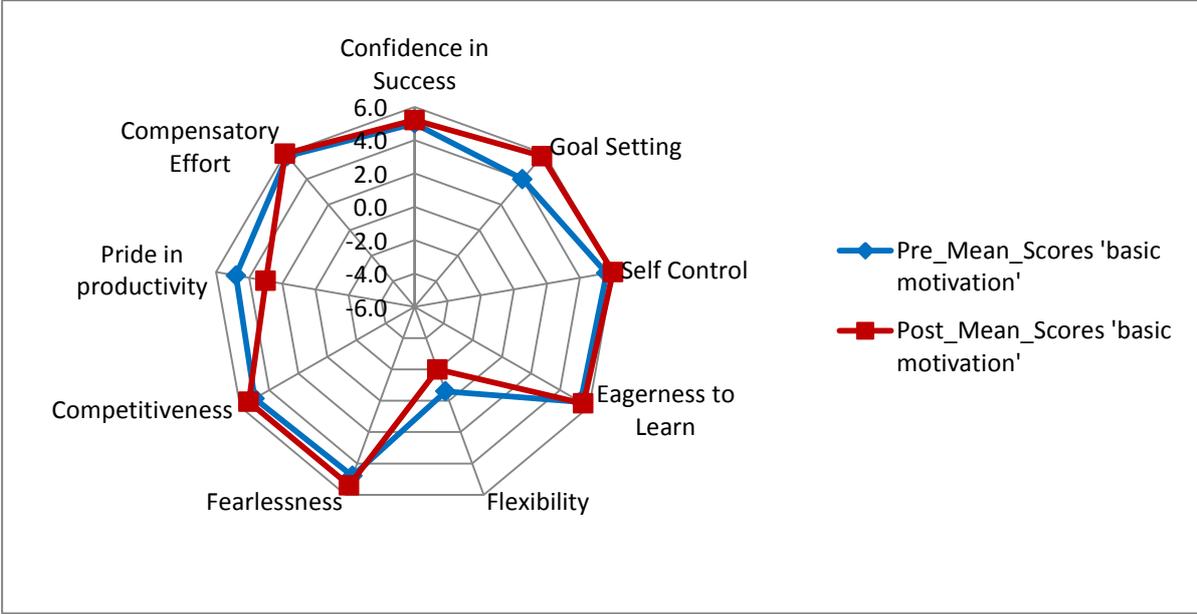
For the post-survey the boxplot diagram discloses a different picture of distribution of scores although the total range does not differ much from the total range in the pre-survey. First of all, the IQR is much broader than in the pre-survey. This suggests a broader distribution of measured values since 50% lie between +38 points and +47 points. Hence, an increased number of measured values spread to the higher motivation scores as well as to the lower motivation scores. Due to this observation it can be assumed that the extreme value of the pre-survey should not be considered as an outlier but rather as indicating a scoring tendency that has reinforced in the post-survey.

Summarized, in the post-survey the range of scores became broader. An initial apparently 'homogenous' scoring in basic motivation became more 'heterogeneous' with an increase of scores but also with an opening towards lower scores and lower motivation degrees. The tendency towards an increased total motivation degree within this group is almost offset by the relative increase of negative/ lower scores in the post-survey resulting in a very slight total improvement of scores.

However, the above results of distribution patterns do not reveal single low-score facets that indicate motivation deficits. It was already mentioned elsewhere that the results from the pre-survey among others served as a basis for the selection of participatory tools and their sequence during the workshops. Hence, analyzing more precisely the scores of single facets was necessary for the realization of participatory workshops (especially identifying low-score motivation facets in order to allow for a targeted stimulation of those). The creation of spider charts served to quickly identify low-score facets by calculation of the group's arithmetic mean per facet, as well as they served to better visualize changes in facet scores in pre- and post-survey.

Figure 37 visualizes group-wise basic motivational deficits before and after the participatory workshops have been applied. At a glance, the pre-survey discloses relative lower scores for the facets *Flexibility* (\bar{x} -0,6 points) and *Goal Setting* (\bar{x} 4 points), as well as for the facet *Fearlessness* (\bar{x} 4,8 points). Based on these insights *Goal Setting*, *Flexibility* and *Fearlessness* were selected to explicitly being worked on during the workshops in *basic group 1* in order to stimulate motivation degrees of these low-score facets.

Figure 37: Comparison of mean facet scores of 'basic motivation' in *basic group 1* (Amlatha PTD-farmers)



Source: ZAHUMENSKY 2013

The post-survey discloses that the low-score facet *Goal Setting* could be addressed successfully as there can be reported a significant increase in the mean score from \emptyset +4 points in the pre-survey to \emptyset +5.8 points in the post-survey. The collateral but likewise important facets *Fearlessness* and *Competitiveness* record also slightly increased mean scores (+0.6 points and +0.4 points increase in the average between pre- and post-survey). Nevertheless, this increase went to the expense of the scores of the facet *Pride in Productivity* that records a decrease of 1.8 points in the average. Additionally, the mean score of *Flexibility* also decreased by 1.4 points from \emptyset -0.6 points in the pre-survey to \emptyset -2 points in the post-survey.

Summarized it can be stated that there was no significant advance in total basic motivation scores in *basic group 1* but a shift of single facet mean scores. The average motivation degrees of *Goal Setting*, *Fearlessness* and *Competitiveness* improved but at the same time motivation degrees in *Flexibility* and *Pride in Productivity* decreased. The facet *Flexibility* that was intended to be stimulated positively during the workshops could not be improved but even worsened.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

Table 10 outlines that out of a possible range of total points between -36 and +36 points of all six facets of questionnaire part II *basic group 1* records a total mean score of 31.8 points in the pre-survey. This total mean score represents a very high average degree of motivation for participation in this group since it reaches very close to the optimum of +36 total points.

Table 10: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 1* (Amlatha PTD-farmers)

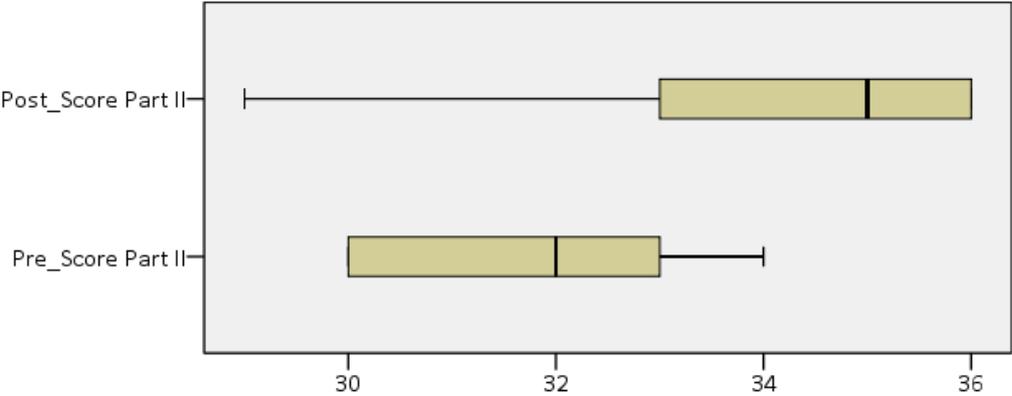
	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score part II	5	30.00	34.00	31.80	1.79
Post_Score part II	5	29.00	36.00	33.80	2.95

Source: ZAHUMENSKY 2013

In the post-survey the high total mean score even increased to 33.8 total points. Yet, the range of all measured values broadened as the minimum decreased by one point and the maximum increased by 2 points. The elevated standard derivation gives expression to the broadened distribution of measured values in the post-survey. Despite the decreased minimum the increase in the mean score by +2 points as well the shift of the maximum from +34 points to +36 points indicates a higher total motivation degree in questionnaire part II.

The following boxplot diagram (figure 38) visualizes more detailed the changes in distribution of scores in motivation for participation in *basic group 1* before and after the farmers experienced participatory tools. Similar to the distributions in basic motivation both distributions of scores (pre- and post-survey) seem not to be normally distributed. But besides the broadened range of measured values there is obviously a change in the skewness of the distribution.

Figure 38: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 1 (Amlatha PTD-farmers)*

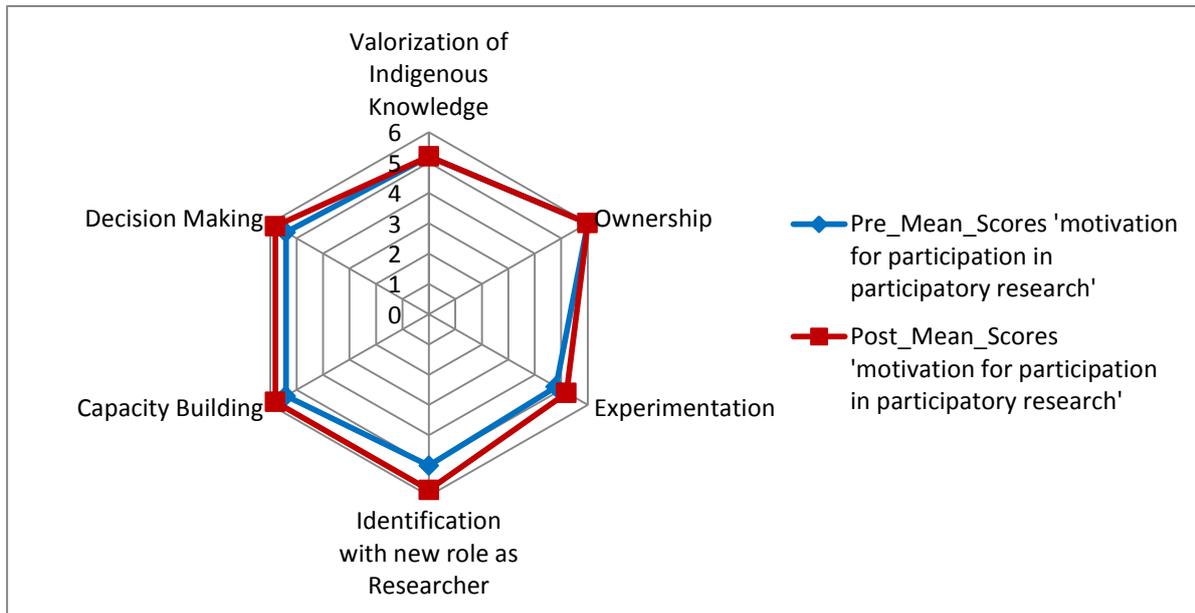


Source: ZAHUMENSKY 2013

While in the pre-survey the distribution seems skewed to the right it seems to be skewed to the left in the post-survey. The IQR in both distributions is the same (3 points) but the box positions reinforce the observation that in the pre-survey 50% of the measured values lie between +30 points and +33 points whereas in the post-survey 50% of the measured values lie much higher between +33 points and + 36 points. With regard to the general tendencies of distributions there can be observed a clear tendency towards higher scores and higher motivation degrees after the group has experienced participatory tools although the total range of measured values increased in the post-survey. Furthermore, there are no extremes or 'outliers', i.e. values outside the 1.5*IQR or 3*IQR.

Figure 39 visualizes the changes in single facet scores before and after the group experienced participatory tools. Since there are no negative scores the scale ranges only from the zero point to the maximum +6 points of each facet.

Figure 39: Comparison of mean facet scores of 'motivation for participation' in *basic group 1 (Amlatha PTD-farmers)*



Source: ZAHUMENSKY 2013

In contrast to the basic motivation scores it can be noticed that in sum there was an increase in total scores and no decrease not in a single score. Even though the total average scores of all facets in questionnaire part II were already very high in the pre-survey some facets of motivation for participation could even be improved after the workshops. Among these the two facets *Experimentation* and *Identification with new role as Researcher* were selected to be especially addressed during the workshops since they recorded the relative lowest scores (\bar{x} +4.8 points and \bar{x} +5 points). The facet *Ownership* turned out to be already at the maximum score before the workshops so that the pre-survey did not indicate a need to work on the facet. Actually, the scores of the facet *Ownership* did not change after the workshops and it continued at the maximum score of average medium +6 points.

The post-survey discloses that besides the already optimal score of the facet *Ownership* and besides an equal scoring of *Valorization of Indigenous Knowledge* all the other facets record an increase in mean scores, especially the facet *Identification with new role as Researcher* that increased from \bar{x} +5 points to \bar{x} +5.8 points. The motivation degree of the facet *Experimentation* could also be slightly improved by 0.4 points. Additionally, the other general participation facets *Capacity Building* and *Decision Making* increased almost to the maximum score of +6 points. Nevertheless, the facet *Valorization of Indigenous Knowledge* showed potential for improvement but actually the scores of this facet could not be increased during the workshops. However, the already high average facet scores and, consequently, the total degree of motivation for participation even increased in sum without

a decrease in single facets. With regard to motivation for participation in the PTD-project *basic group 1* represents an almost optimal motivation degree in the post-survey.

6.3.1.2 Basic group 2

– **Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)**

As table 11 outlines the range of measured values in *basic group 2* did not change remarkably between pre- and post-survey. The minimum shifted from +25 total points to +28 total points while the maximum remained constant. Hence, the distribution of facet scores in *basic group 2* seems to have narrowed very slightly after having experienced participatory tools. Yet, the arithmetic mean increased by +3.07 points from an average +38.85 total points to +41.92 total points. These means are very similar to the means in *basic group 1* but the increase of the mean score in the post-survey is higher than in *basic group 1*. However, the high total scores in both pre- and post-survey indicate a high motivation degree among the farmers in *basic group 2* since the averages lie close to the possible optimum of +54 total scores in questionnaire part I.

Table 11: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 2* (Choli PTD-farmers)

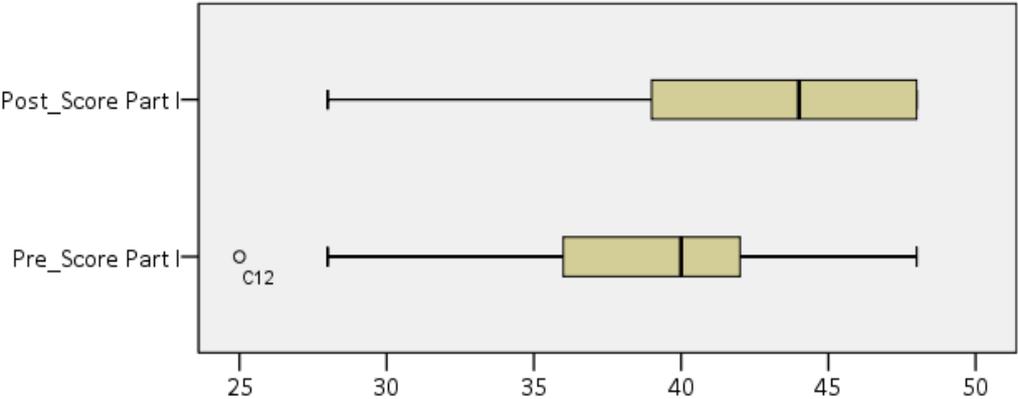
	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part I	13	25.00	48.00	38.85	6.72
Post_Score Part I	13	28.00	48.00	41.92	6.87

Source: ZAHUMENSKY 2013

With respect to the distribution patterns there can be observed a slight tendency towards higher total mean scores. Very few changes in the standard derivation reinforce the assumption of small changes in score distributions per facet.

The following boxplot diagram (figure 40) visualizes the distribution of scores in basic motivation facets of *basic group 2*. Obviously, the minimum score of +25 total points of the pre-survey is interpretable as an extreme or 'mild outlier' (farmer ID C12 lying outside 1.5*IQR) so that the range of measured values can be considered as constant.

Figure 40: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in basic group 2 (Choli PTD-farmers)

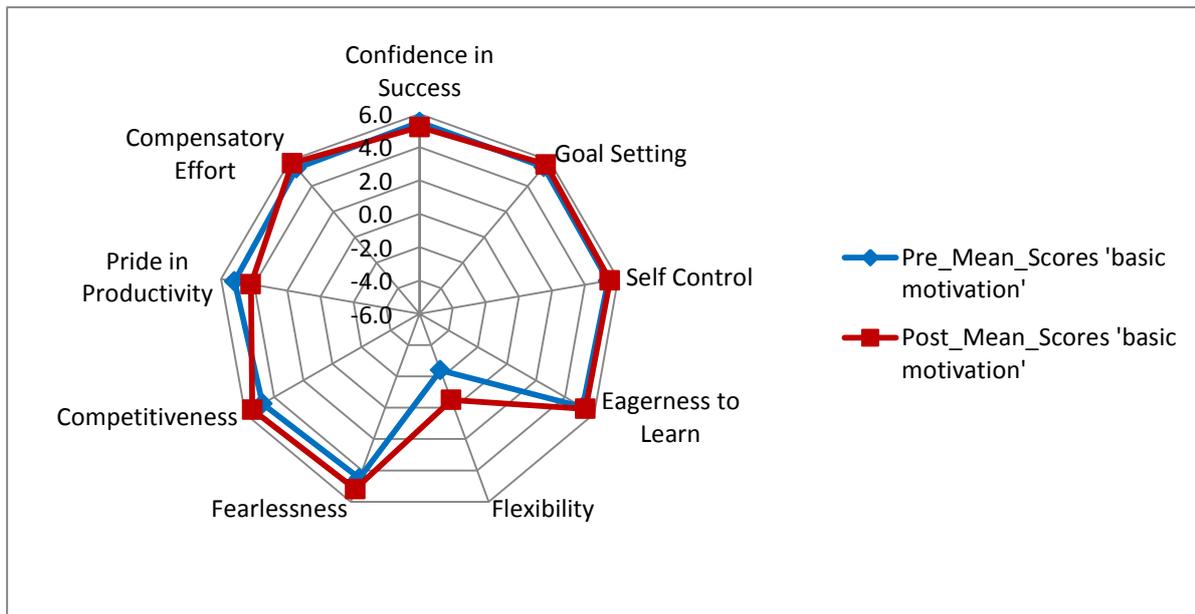


Source: ZAHUMENSKY 2013

Furthermore, it is apparent that the measured values are almost normally distributed in the pre-survey. This distribution seems to have shifted to a left-skewed distribution in the post-survey with a change of the IQR by +3 points from an IQR of 6 points to an IQR of 9 points. This means that in the pre-survey 50% of all measured values lie between a total average score of +36 points and +42 total points while in the post-survey 50% of all measured values lie between an average score of +39 total points and +48 total points. Although there was a broadening of the IQR, i.e. a broadening of the distribution, half of the measured values evidently are located in the zone of higher scores in the post-survey. Hence, there can be deduced a tendency towards higher scores and higher basic motivation degrees in *basic group 2*.

The following spider chart (figure 41) illustrates the changes in basic motivation facet scores before and after *basic group 2* has experienced participatory tools. In general, the scores are very close to the maximum in both pre- and post-survey and thus the changes are little. However, the pre-survey disclosed some potential for improvement with the three facets *Flexibility*, *Fearlessness* and *Competitiveness*. Therefore they were intended to be particularly addressed during the workshops.

Figure 41: Comparison of mean facet scores of 'basic motivation' in *basic group 2* (Choli PTD-farmers)



Source: ZAHUMENSKY 2013

The comparison of the scores of the pre- and post-survey reveals increased scores for all of the above mentioned facets. The facets *Fearlessness* and *Competitiveness* increased each by 0.7 points each from \emptyset +4.5 points to \emptyset +5.2 points (*Fearlessness*) from \emptyset +4.8 points to \emptyset +5.5 points (*Competitiveness*) after having experienced participatory tools. The facet *Flexibility* even increased by +1.9 points from \emptyset -2.4 points to \emptyset -0.5 points. Meanwhile the average score for the facet *Pride in Productivity* decreased by -1 point from \emptyset +5.2 points to \emptyset +4.2 points.

It can be stated that in comparison to *basic group 1* the total basic motivation degree of *basic group 2* is slightly higher in the post-survey than in the first group. The average motivation degrees of *Fearlessness*, *Flexibility*, and *Competitiveness* could be positively stimulated but at the same time the motivation degree of *Pride in Productivity* decreased. In sum, however, there can be reported a considerable improvement of basic motivation degrees for *basic group 2*.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

The first general statistical analysis of measured values of motivation for participation in *basic group 2* shows a different scoring in comparison to *basic group 1* (see table 12). In the pre-survey the range of all measured values lies between +17 total points and +36 total points. The minimum is much lower than in *basic group 1* although the pre-

survey's maximum is higher than in *basic group 1*. Yet, the arithmetic means of total scores in motivation for participation of *basic group 2* are slightly lower than the means of *basic group 1* with a mean of +29.69 total points in the pre-survey and +31.92 total points in the post-survey. At least, there can be reported an increase of +2.23 points in the arithmetic mean between pre- and post-survey. This advance is similar to the increase in the mean of total points in *basic group 1*. In general, the degree of motivation for participation can be considered as very high since the scores are close to the optimum of theoretically possible +36 total points.

Table 12: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 2* (Choli PTD-farmers)

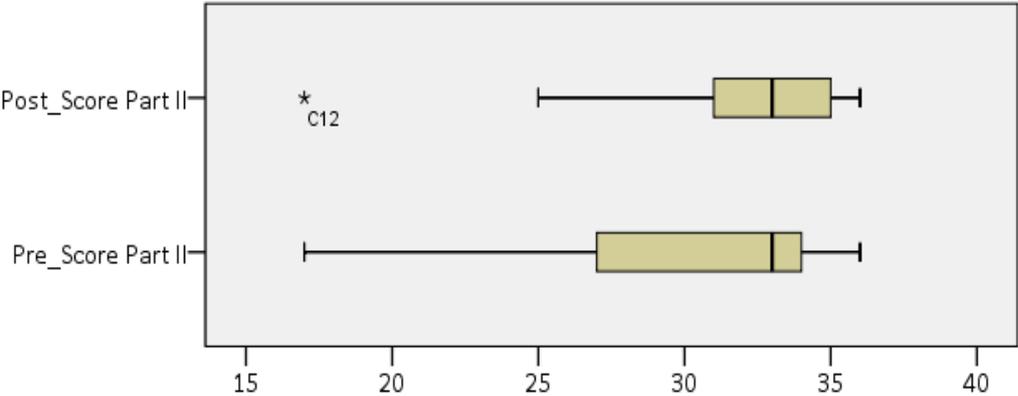
	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part II	13	17.00	36.00	29.69	6.47
Post_Score Part II	13	17.00	36.00	31.92	5.39

Source: ZAHUMENSKY 2013

Besides the broad range of measured values the relative high standard derivations (SD) indicate a broad distribution of single facet mean scores whereas the variance seem to have diminished in the post-survey by average 1.8 points from an SD of 6.47 to an SD of 5.39 points. One can assume that the distribution of measured values changed to a more narrow distribution around the arithmetic mean in the post-survey.

The following boxplot diagram (figure 42) concretizes the above observations. In fact, the distribution seems to have narrowed in the post-survey since 50% of the measured values lie between +31 total points and +35 total points while in the pre-survey half of the measured values still laid between +27 points and +34 points.

Figure 42: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 2* (Choli PTD-farmers)

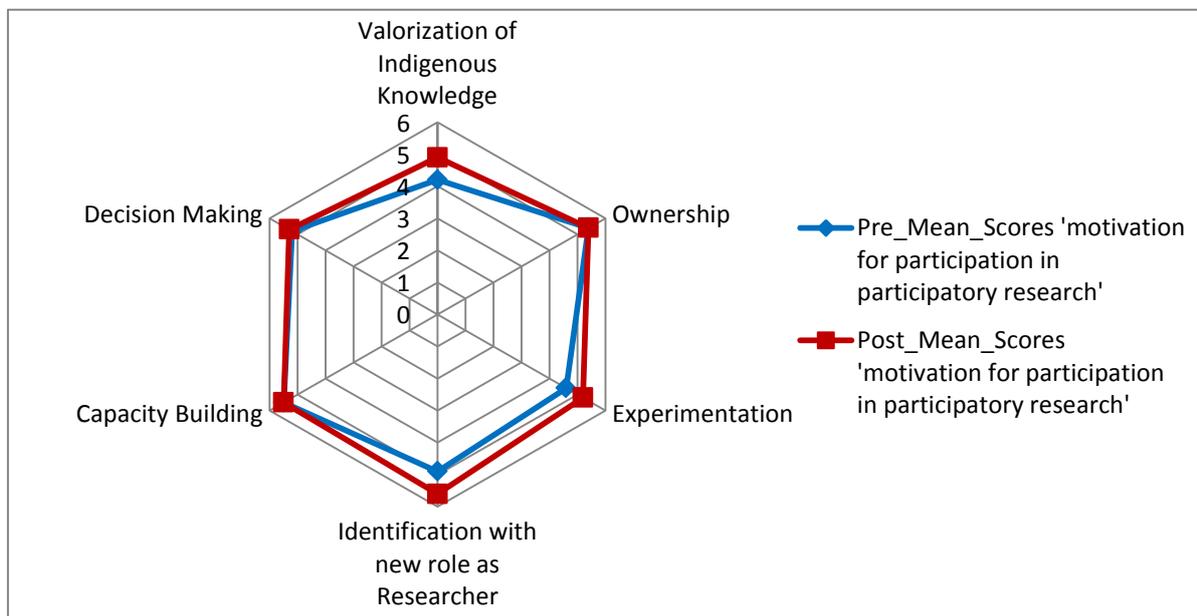


Source: ZAHUMENSKY 2013

The IQR did not only change its position but also diminished in the expansion by 3 points from 7 points in the pre-survey to 4 points in the post-survey. From these facts it can be derived that the measured values condensed around the higher scores (tendency to a left-skewed distribution) and thus indicate a higher motivation degree in *basic group 2* after the participants have experienced participatory tools. An additional sign for the narrowing of the distribution of scores is that the minimum of +17 total points is located outside the 3*IQR in the post-survey and thus it can be characterized as extreme or even 'outlier'. This leads to the assumption that - disregarding the extreme - the range of measured values actually lies much higher between +25 total points and +36 total points in the post-survey.

The comparison of the pre- and post-survey scores per facet give more detailed information about the distribution patterns of single facets of motivation for participation in *basic group 2*. As it can be observed in the following spider chart (figure 43) the pre-survey reveal that with the facets *Valorization of Indigenous Knowledge* and *Experimentation* there is potential for improvement although the scores are already high. Besides the facet *Identification with new role as Researcher* could also be stimulated during the workshops. Hence, these three facets were intended to be particularly addressed during the workshops in order to increase their motivation degrees.

Figure 43: Comparison of mean facet scores of 'motivation for participation' in *basic group 2* (Choli PTD-farmers)



Source: ZAHUMENSKY 2013

In the post-survey there is evidence about an increase of scores especially with the three above facets. Therefore it can be assumed that the efforts to stimulate the relative low-score facets in motivation for participation in *basic group 2* have been successful. Scores of the facet *Valorization of Indigenous Knowledge* increased by $\phi +0.7$ points from $\phi +4.2$ in

the pre-survey to \emptyset +4.9 points in the post-survey. Similarly, the average scores of the facet *Experimentation* increased by average +0.6 points from \emptyset +4.6 points in the pre-survey to \emptyset +5.2 points in the post-survey, as well as scores of the facet *Identification with new role as Researcher* increased by average +0.6 points from \emptyset +4.9 points in the pre-survey to \emptyset +5.6 points in the post-survey. The increase in average points of some facets did not go to the expense of average scores of other facets since none of the facet scores diminished. Summarized, it can be stated that the three facets that are most relevant for the PTD-project (*Experimentation*, *Valorization of Indigenous Knowledge*, and *Identification with new role as Researcher*) could be positively stimulated during the participatory workshops.

6.3.1.3 Basic group 3

– **Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)**

As it can be seen from table 13 *basic group 3* records a total score of all nine basic motivation facets of +35 total points in the pre-survey. In the post-survey the mean score increased by 4 points to +39 total points. In the first instance this indicates a considerable increase in total scores and an increase in the basic motivation degree of *basic group 3*.

Table 13: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 3* (Badi PTD-farmers)

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part I	6	11.00	48.00	35.00	17.37
Post_Score Part I	6	32.00	48.00	39.00	6.00

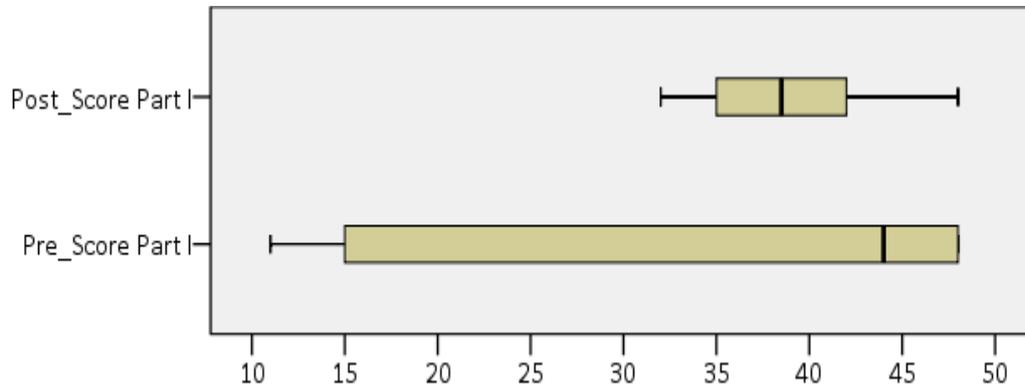
Source: ZAHUMENSKY 2013

Yet, there is a notably broad range of all measured values with a minimum of +11 total points and a maximum of +48 total points in the pre-survey. The high pre-survey's standard derivation of 17.37 points suggests a very broad distribution of scores in basic motivation. Due to the low minimum score the total mean score in the pre-survey indicates a lower motivation degree than in *basic groups 1* and *2*. Nevertheless, the total mean score is still close to the optimum of possible +54 points and thus the basic motivation degree can be considered as high.

In the post-survey the range of all measured values narrowed significantly because the minimum shifted to +32 total points. The much lower standard derivation points on a much narrower distribution of scores in the post-survey that results in an elevated total mean of +39 total points. Figure 44 concretizes the distribution patterns in basic motivation of *basic group 3*. In fact, with a range of 33 points the IQR in the pre-survey shows a very

broad expanse. This means that in the pre-survey 50% of all measured values lie between +15 and +48 total points.

Figure 44: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in basic group 3 (Badi PTD-farmers)



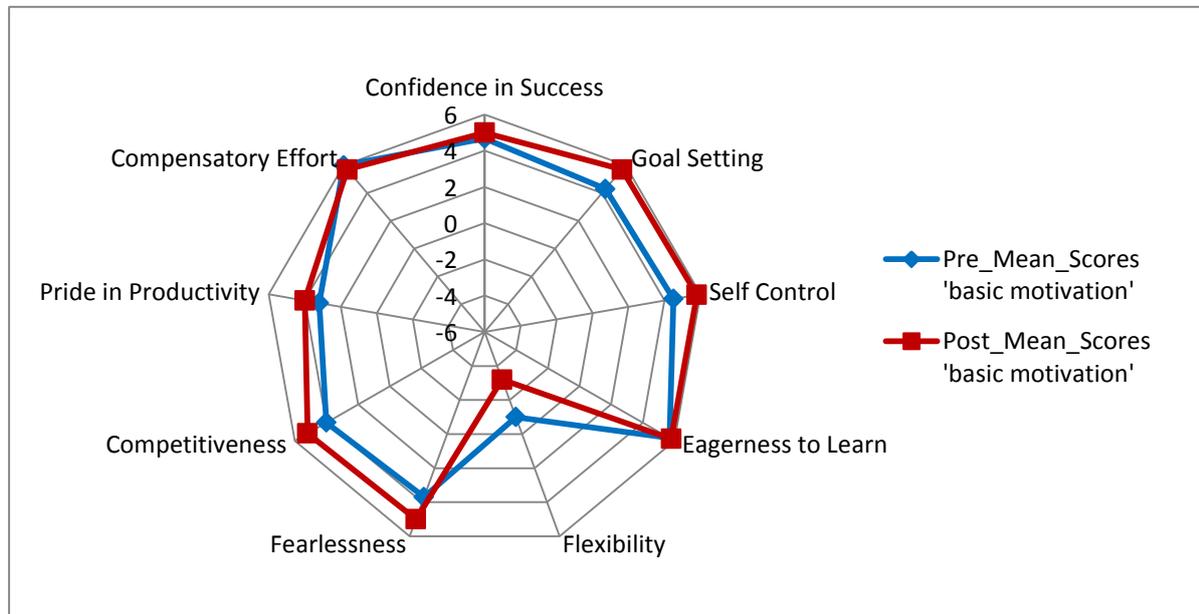
Source: ZAHUMENSKY 2013

With respect to such a broad range the arithmetic mean is hardly informative since it is distorted by extreme value(s). The pre-survey's median (+44 total points) seems to be more adequate for the interpretation of the distribution in this case. For the pre-survey of *basic group 3* the median indicates that half of the measured values lie in a narrow range between +44 and +48 total points while the other half lie in a broad range between +44 and +11 points. The range towards the lower scores is very broad while the measured values of the higher scores condense around +46 total points. It can be assumed that the distribution is rather bimodal with a clear peak around the higher scores. The other less marked peak of almost extreme low scores diminished the arithmetic mean of table 13 considerably. This results in the assumption that already in the pre-survey there is a clear tendency towards the higher scores.

The results of the post-survey reinforce the tendencies of a distribution that spreads rather around the higher scores. Obviously, in the post-survey the range of all measured values narrowed to a range between +32 total points and +48 total points. This distribution seems to be almost normally distributed since the median marks the middle of the box/ almost the middle of the range between minimum and maximum with an IQR of 7 points between +35 total points and +42 total points. From the boxplot diagram (figure 44) follows that 50% of all measured values lie between +35 total points and +42 total points. Hence, the results of the post-survey are much clearer than in the pre-survey and it can be assumed that the group scores are much more homogenous than in the pre-survey. In sum, the average total score of basic motivation in *basic group 3* increased significantly in the post-survey.

The following spider chart (figure 45) displays the changes in single facet scores after the group has experienced participatory tools.

Figure 45: Comparison of mean facet scores of 'basic motivation' in *basic group 3* (*Badi* PTD-farmers)



Source: ZAHUMENSKY 2013

In *basic group 3* the changes in single facet scores are relatively distinct. The pre-survey shows potential for improvement particularly for the facets *Flexibility* (\emptyset -1 point), *Pride in Productivity* (\emptyset +3.2 points), *Fearlessness* (\emptyset +3.7 points), and *Competitiveness* (\emptyset + 4 points). The facets *Eagerness to Learn* and *Compensatory Effort* were already close to or at the maximum positive score, i.e. close to the highest motivation degree. Therefore the facets *Flexibility*, *Pride in Productivity*, *Fearlessness*, and *Competitiveness* were intended to be especially stimulated during the workshops.

The post-survey reveals that the most significant changes can be reported for the facet *Flexibility* where the average facet score decreased by \emptyset -2.2 points. All the other facets record increased scores in the post-survey. Especially the facets *Goal Setting*, *Self Control*, *Fearlessness*, and *Competitiveness* increased their average score by +1.4 points, +1.3 points, +1.3 points and +1.2 points. Since the latter two facets have been especially addressed during the workshop their stimulation can be considered as having been successful.

Summarized, *basic group 3* showed relative much potential for improvement of a variety of basic motivation facets. The distribution of scores of single facets revealed that the most basic motivation facets could be positively stimulated. Even facets that were not explicitly worked on during the participatory workshops increased in single facet scores. This

resulted in a net increase of the total basic motivation degree by +4 points: the most significant increase in total scores of basic motivation among all investigated groups.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

The first basic statistical analysis that is listed in table 14 shows that the degree of motivation for participation of *basic group 3* is very high and that the means (+33.1 total points in the pre-survey and +30.17 total points in the post-survey) are comparable to the means of *basic group 1* that was assumed to be the most advanced group. Meanwhile the ranges of all measured values as well as the standard derivations (SD) differ from distribution patterns of *basic group 1* as the mean score decreased in the post-survey and the standard derivations are higher than in *basic group 1*.

Yet, the degree of motivation for participation in *basic group 3* still can be considered as high since the means are close to the theoretically possible maximum of +36 total points. However, the standard derivations are relative high and indicate a broad distribution of scores with an even broader distribution of scores after the group has experienced participatory tools.

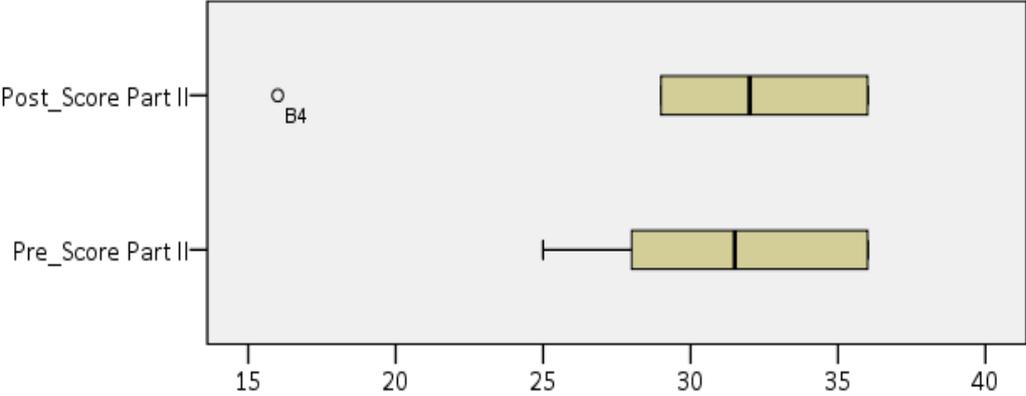
Table 14: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 3* (*Badi* PTD-farmers)

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part II	6	25.00	36.00	31.33	4.89
Post_Score Part II	6	16.00	36.00	30.17	7.68

Source: ZAHUMENSKY 2013

In the post-survey the range of all measured values increased due to a shift of the minimum score from +25 total points to +16 total points although the maximum continues at the optimal score of +36 total points. This shift of the minimum results in a decrease of the arithmetic mean by -1.16 points. The following boxplot diagram (figure 46) visualizes the changes in distribution patterns of motivation for participation in *basic group 3*.

Figure 46: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 3 (Badi PTD-farmers)*



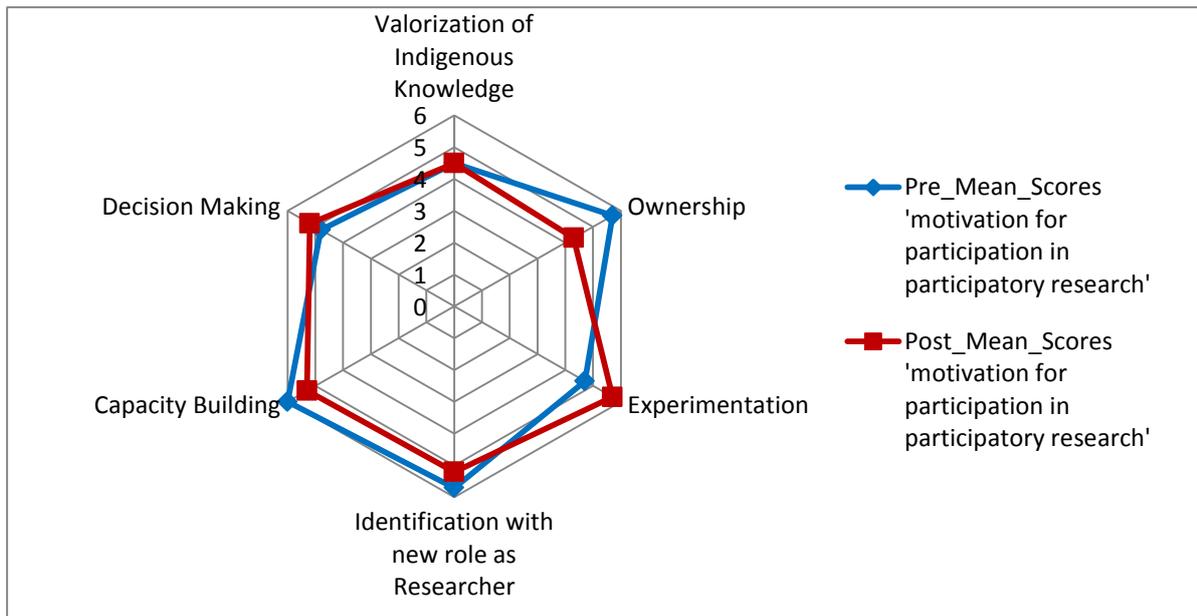
Source: ZAHUMENSKY 2013

The IQR of the pre-survey is slightly broader than in the post-survey (spanning 8 points vs. 7 points). While in the pre-survey 50% of all measured values spread within an IQR between +28 total points to +36 total points they condense within an IQR between +29 total points and +36 total points in the post-survey.

In the pre-survey the minimum of +25 total points lies still within the 1.5*IQR. There is no upper whisker in the pre-survey so that a rather left-skewed distribution can be assumed, i.e. a spread of scores around the higher scores. Meanwhile, in the post-survey the minimum of +16 total points (farmer ID B4) is marked as extreme or 'mild outlier' that is situated outside the 1.5*IQR. As there are no whiskers in the boxplot of the post-survey all measured values (except the excluded extreme) lie within an IQR of +29 total points and +36 total points. The boxplot diagram does not indicate significant changes in the distribution patterns except of the extreme value. Based on the present diagram it can only be assumed that this 'outlier' is suggested to have decreased the total mean of the post-survey.

Figure 47 is more informative and reveals that despite the unaltered distribution patterns there is observable a significant shift of single facet scores before and after the participants have experienced participatory tools.

Figure 47: Comparison of mean facet scores of 'motivation for participation' in *basic group 3 (Badi PTD-farmers)*



Source: ZAHUMENSKY 2013

The spider chart illustrates that in the pre-survey there is potential for improvement particularly of the facets *Valorization of Indigenous Knowledge*, *Experimentation*, and *Decision Making*. The former two are highly relevant for the PTD-project. Nevertheless, only the facet *Experimentation* could evidently be stimulated during the workshops and record an increase of +1 point from \bar{x} +4.7 points to \bar{x} +5.7 points. The facet *Decision Making* records only a slight increase of \bar{x} +0.4 points. The motivation degree of *Valorization of Indigenous Knowledge* remains unaltered.

The improvements of scores went to the expense primarily of the facet *Ownership* whose score decreased by -1.4 points from \bar{x} +5.7 points to \bar{x} +4.3 points. The other facets with the highest losses in scores were *Capacity Building* (-0.7 points) and *Identification with new role as Researcher* (-0.5 points).

6.3.1.4 Basic group 4

– Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)

Basic group 4 was assumed to generally show the lowest motivation degrees within the group of investigation of PTD-farmers. Interestingly, this group records the highest total means of basic motivation among the PTD-farmers. Hence, the group's basic motivation degree seems to be very high as the means lie very close to the theoretically possible optimum of +54 total points. Table 15 illustrates that the arithmetic mean is almost constant in the post-survey.

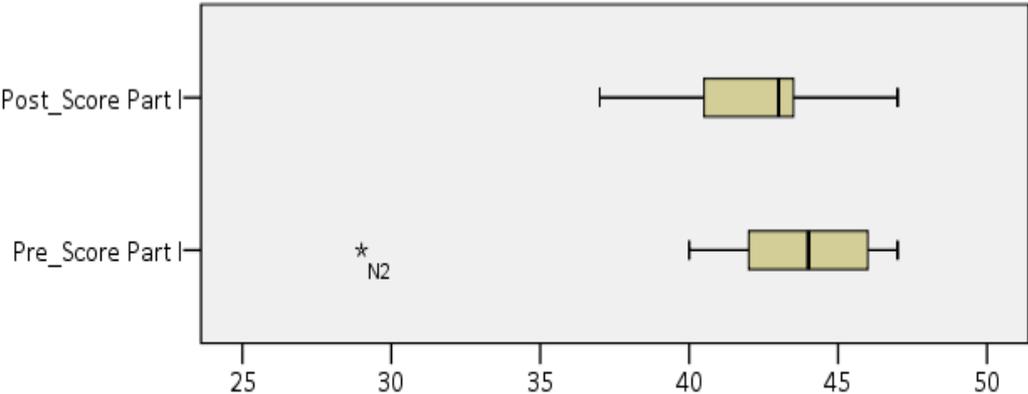
Table 15: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 4 (Nimrani PTD-farmers)*

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part I	7	29.00	47.00	42.29	6.32
Post_Score Part I	7	37.00	47.00	42.14	3.49

Source: ZAHUMENSKY 2013

While the pre-survey's range lies between +29 total points and +47 points the post-survey's range lies narrower between +37 points and +47 points. Accordingly, the SD decreased considerably compared to the pre-survey (from 6.32 points to 3.49 points). Figure 48 illustrates the distribution patterns of total basic motivation scores in *basic group 4* in more detail. The minimum score of +29 total points lies outside the 3*IQR and is thus marked as 'extreme outlier'. Under disregard of this outlier the remaining measured values are quite normally distributed with a minimum score of +40 total points and a maximum of +47 total points. The pre-survey's IQR ranges from +42 total points to +46 total points. From this follows that 50% of all measured values lie within this narrow and high range.

Figure 48: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 4 (Nimrani PTD-farmers)*



Source: ZAHUMENSKY 2013

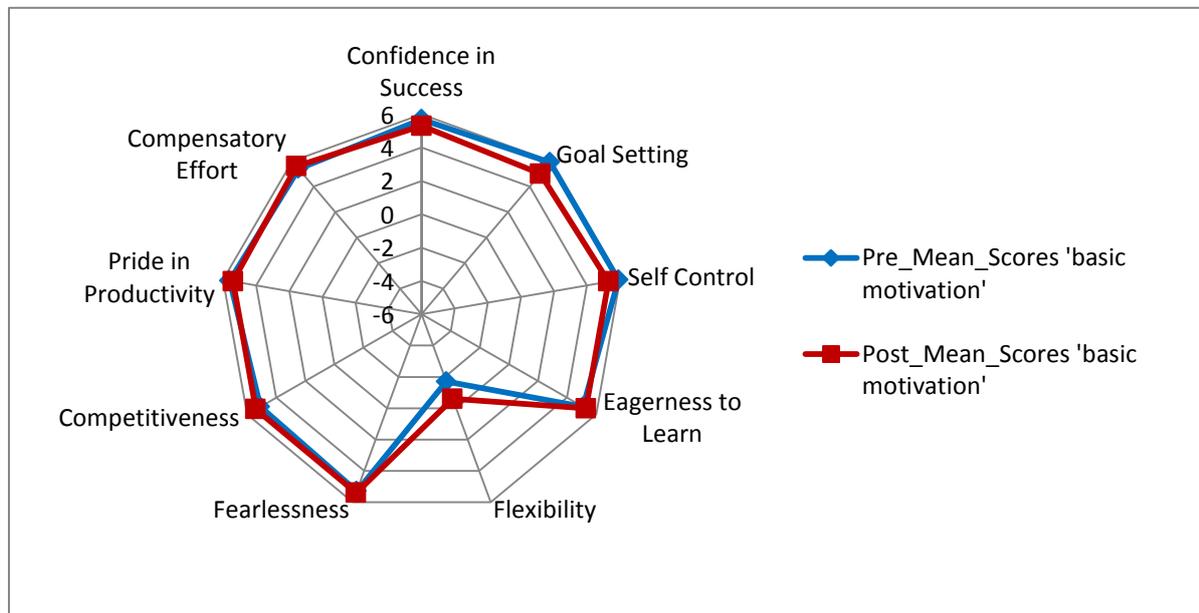
In the post-survey the much more elevated minimum score of +37 total points lies within the 1.5*IQR and thus it is not to be taken as extreme value. The scores of the post-survey are normally distributed with a slight tendency to the right (= towards the higher scores). This can be derived through the location of the median that is situated on the right

(or upper) limit of the box. Furthermore, the extent of the IQR of the post-survey diminished by 1 point from 4 points in the pre-survey to 3 points in the post-survey. This suggests that the spread of measured values narrowed in the post-survey since 50% of all scores distribute within a more dense range from between +42 and +46 total points to between +40.5 and +43.5 total points. Yet, at the same time this range shifted to the lower total scores.

It can be assumed that the pre-survey's 'outlier' increased in the total score after having experienced participatory tools so that he could be integrated into the 1.5*IQR with the result that the range of all measured values in the post-survey broadened (more distant whiskers) to the lower scores. A closer look on the single scores of the farmer with the ID 'N2' discloses that this farmer's score increased towards the mean score around +42 total points.

Summarized, it can be stated that the total mean scores of basic motivation in *basic group 4* did not change significantly after the group has experienced participatory tools. Figure 49 visualizes the changes in average single facet scores of basic motivation in *basic group 4*.

Figure 49: Comparison of mean facet scores of 'basic motivation' in *basic group 4* (Nimrani PTD-farmers)



Source: ZAHUMENSKY 2013

Obviously, there is in fact neither significant change towards the positive nor towards the negative single facet scores. With regard to the already very high mean facet scores that lie very close to the theoretically optimum of average +6 points there seems to be on the one hand almost no need for improvement of the scores and on the other hand,

an improvement is practically not possible. This does not extend to the facet *Flexibility* which shows relative low scores and hence a relative low average motivation degree in the pre-survey. Therefore, this facet was intended to be especially worked on during the workshops.

In the post-survey the facet *Flexibility* records an increase by +1.1 points from \emptyset -1.7 points to \emptyset -0.6 points. Until now, an increase in this facet's score is untypical since all the other PTD-groups showed a decrease in the scores of the facet *Flexibility* after they had experienced participatory tools¹⁵⁸. Additionally, in the post-survey the facet *Goal Setting* decreased by -0.9 points, followed by a decrease of -0.6 points for the facet *Self Control*.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

The comparison of total pre- and post-scores of motivation for participation shows more significant changes than in basic motivation of *basic group 4*. As per table 16 the arithmetic mean in the pre-survey supersedes the mean in the post-survey by 1.72 points. This seems to be attributable to the lowered minimum total score of +20 points in the post-survey.

Table 16: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 4* (Nimrani PTD-farmers)

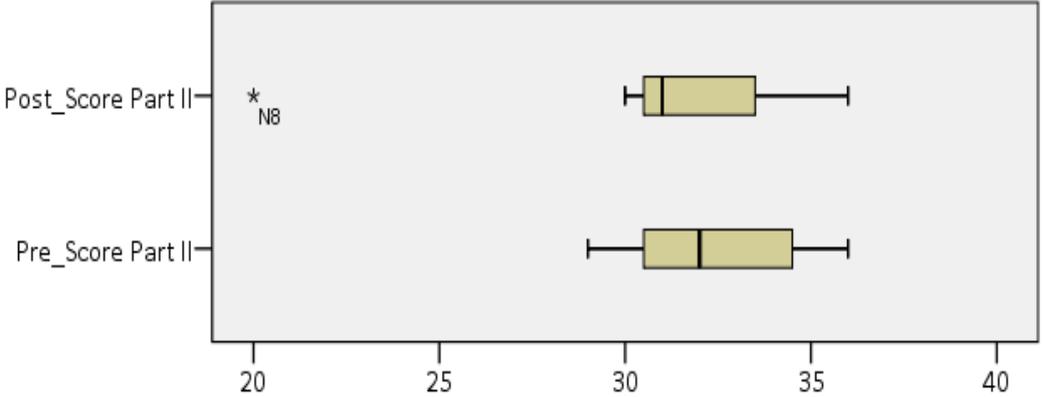
	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part II	7	29.00	36.00	32.43	2.76
Post_Score Part II	7	20.00	36.00	30.71	5.16

Source: ZAHUMENSKY 2013

Hence, although the post-survey's maximum continues at the theoretically possible maximum of +36 points the range of measured values broadened. The elevated standard derivation of the post-survey reinforces the tendency towards a broader distribution of all measured values in this group. The following boxplot diagram (figure 50) gives information about the distribution patterns of scores of motivation for participation in *basic group 4*.

¹⁵⁸ Observations on the generally exceptional scoring patterns of the facet *Flexibility* will be addressed more detailed in chapter 7.3 where results of the qualitative and quantitative evaluation will be discussed.

Figure 50: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 4* (Nimrani PTD-farmers)

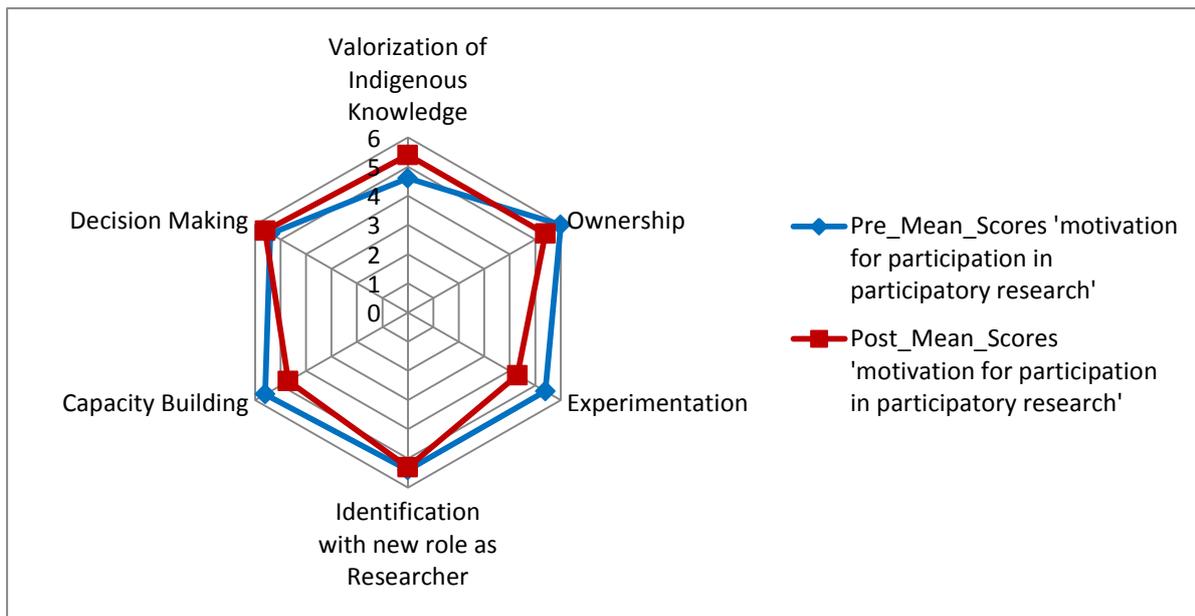


Source: ZAHUMENSKY 2013

The diagram displays a rather normal distribution of scores and an IQR between +30.5 total points and +34.5 total points in the pre-survey. Half of the measured values thus spread closely around the median of +32 total points with a slight right-skewed tendency. The right-skewedness of the distribution is reinforced in the post-survey where the lower (left) whisker reduced while the right whisker increased, as well as the median shifted to the left. From this can be derived that 50% of the measured values range from +30.5 total points to +33.5 total points (= IQR of 3 points vs. 4 points in the pre-survey). Hence, the distribution narrowed slightly.

These assumptions base on the disregard of the extreme that lies outside the 3*IQR and which is therefore marked as 'extreme outlier'. A look on the data matrix displays that the farmer with the ID 'N8' already recorded lower scores in the pre-survey and that the negative scoring of this farmer even increased in the post-survey of both questionnaire parts. He was (rightly) marked as extreme since his negative scoring increased disproportionally compared to the decreased scorings of the other farmers. However, the general tendency towards the lower scores seems to be representative for *basic group 4*. The following spider chart (figure 51) reveals changes in the single scores per facet in motivation for participation in *basic group 4*.

Figure 51: Comparison of mean facet scores of 'motivation for participation' in *basic group 4* (Nimrani PTD-farmers)



Source: ZAHUMENSKY 2013

The changes in the distribution of facet scores are much more significant than in the facet scores of basic motivation in this group. Particularly the facet *Valorization of Indigenous Knowledge* shows potential for improvement in the pre-survey while the other facets record rather optimal scores. Consequently, *Valorization of Indigenous Knowledge* was selected to work on during the workshops.

Despite an increase in the desired facet *Valorization of Indigenous Knowledge* of 0.8 points from \bar{x} +4.6 to \bar{x} +5.4 points especially the scores of the facet *Experimentation* decreased by -1.1 points from \bar{x} +5.4 to \bar{x} +4.3 points followed by a decrease of 0.9 points in the facet *Capacity Building* (from \bar{x} +5.6 to \bar{x} +4.7 points) and a decrease of 0.6 points in the facet *Ownership* (from \bar{x} +6 to \bar{x} +5.4 points) after the group has experienced participatory tools.

In sum, there was a lowering of scores in questionnaire part II in *basic group 4*, and hence a lowering of the degree of motivation for participation in participatory research. Increased scores of the facet *Valorization of Indigenous Knowledge* are offset by decreased motivation degrees in *Experimentation*, *Capacity Building* and *Ownership*.

6.3.1.5 Basic group 5

– Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)

This group is part of the control group that served for the comparison of general scoring patterns of the group of investigation (*basic groups 1-4*: all PTD-farmers) in contrast

to the control group of bioRe farmers that do not participate in the PTD-project. The motivation degrees in the control group (*basic groups 5 and 6*) were assumed to be the lowest due to the fact that there was no motivation to participate in the PTD-project among those bioRe farmers as well as due to the resulting lack of experience with PTD-activities and their possible benefits.

For basic motivation the following basic statistical values could be calculated in table 17. The average total motivation degree in *basic group 5* is very high since the mean scores lie close to the optimum of +54 total points. Furthermore, the means are very similar to the means of *basic group 2* which was assumed to be the group with the second highest motivation degrees. In the pre-survey of *basic group 5* the range of all measured values lies between +30 and +48 total points. Meanwhile, the standard derivation is medium so that a relatively high variance can be assumed.

Table 17: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 5* (Choli non-PTD-farmers)

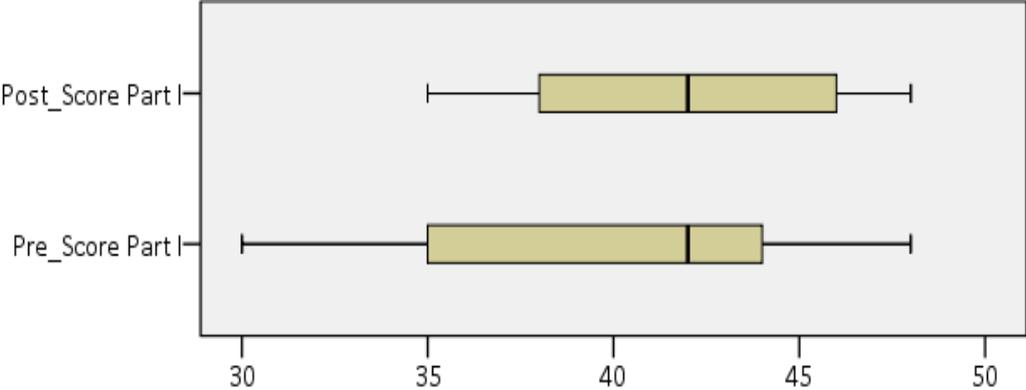
	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part I	10	30.00	48.00	39.80	5.75
Post_Score Part I	10	35.00	48.00	42.00	4.27

Source: ZAHUMENSKY 2013

There can be observed a narrowing of the range of all measured values in the post-survey and a diminished SD that indicates a more dense distribution of the post-scores. The narrowed range arises from an elevated minimum in the post-survey (from +30 points to +35 total points) and is accompanied by an increase of the mean score by 2.2 points from +39.8 total points to +42 total points.

The following boxplot diagram (figure 52) concretizes the distribution changes of scores in basic motivation in *basic group 5*. In both surveys the measured values are normally distributed. Besides the obviously narrowed range of all measured values it can be observed that the IQR diminished and shifted to the right towards the higher scores. In the pre-survey the IQR lies between +30 total points and +48 total points encompassing a span of 9 points. In the post-survey the IQR lies between +38 total points and +46 total points encompassing a smaller span of 8 points. From this it can be derived that half of the measured value lie in a smaller range of higher scores in the post-survey.

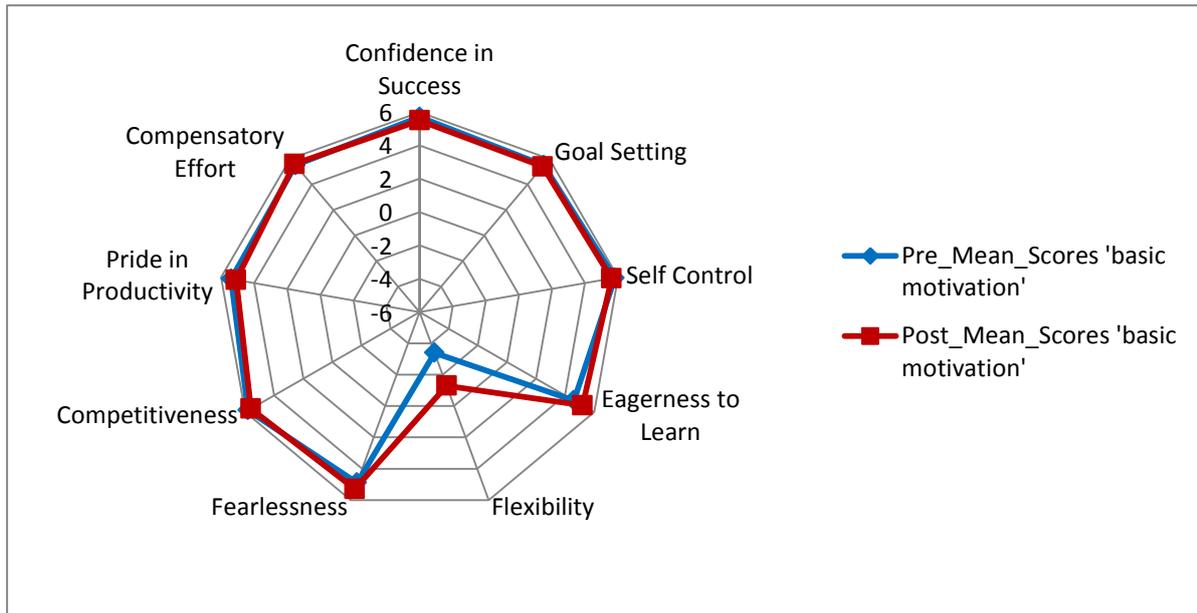
Figure 52: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in basic group 5 (Choli non-PTD-farmers)



Source: ZAHUMENSKY 2013

The following spider chart (figure 53) gives information about the changes of single facet scores in basic motivation of *basic group 5*. As the diagram illustrates the scores of almost all facets are already very high in the pre-survey. There is only potential for improvement of scores with regard to the facets *Flexibility* and very slight potential for improvement of the facet *Eagerness to Learn*. For this reason, *Flexibility* was tried to be stimulated during the workshops in *basic group 5*.

Figure 53: Comparison of mean facet scores of 'basic motivation' in *basic group 5* (Choli non-PTD-farmers)



Source: ZAHUMENSKY 2013

The changes in average facet scores are almost not visible due to the already very high scores per facet. Except the facet *Flexibility* that increased by 2.1 points from \emptyset -3.4 points in the pre-survey to \emptyset -1.3 points in the post-survey. Furthermore, the facet *Eagerness to Learn* increased slightly by 0.6 points from \emptyset +4.6 points to \emptyset +5.2 points.

Summarized, the facets of basic motivation that were intended to be stimulated increased after the group members had experienced participatory tools. Insofar, the workshops can be considered as successful in *basic group 5*.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

First of all, the high means of both pre- and post-survey in the questionnaire part that assesses motivation for participation in *basic group 5* are striking since they lie very close to the possible maximum score of +36 total points (see table 18). There is no change in the means after the participatory workshops have taken place but a change in the range of all measured values. The minimum increased by +3 points from a minimum of +24 total points to +27 total points while the maximum remains with +36 total points. Besides this narrowed range of all measured values, the decreased SD indicates a narrower distribution of scores in the post-survey than in the pre-survey.

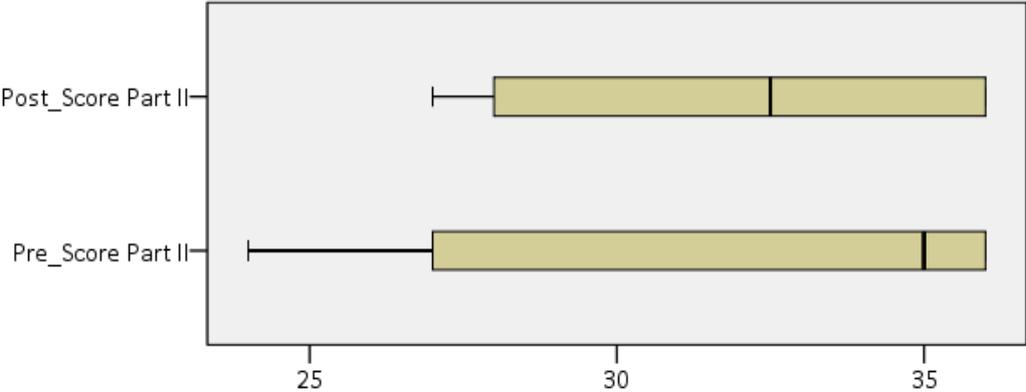
Table 18: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 5 (Choli non-PTD-farmers)*

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part II	10	24.00	36.00	32.00	4.76
Post_Score Part II	10	27.00	36.00	32.00	3.77

Source: ZAHUMENSKY 2013

The changes in distribution of scores appear clearer if one looks at the following boxplot diagram (figure 54) that visualizes distributional patterns. From it there can be discerned that in the pre-survey the distribution is indeed broader. It is not only the range of all measured values that narrowed but likewise the IQR of pre- and post-survey. While in the pre-survey the IQR ranges from +27 total points to +36 total points the IQR of the post-survey ranges from +28 total points to +36 total points. Hence, half of the post-survey's measured values lie within a slightly narrower IQR than in the pre-survey.

Figure 54: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 5 (Choli nonPTD-farmers)*



Source: ZAHUMENSKY 2013

At the same time, in the pre-survey there can be deduced that there was a higher frequency of scores towards the very high scores of around +35 total points since the median is situated very close to the right/ upper border of the box at +35 total points. This means that there are as much measured values below the median as above the median of +35 total points. But since the range of the left/ lower quartile (1st quartile) is much broader than the right/ upper quartile (3rd quartile) the span of measured values in the left quartile is assumed to be much broader than the span of scores in the upper quartile. In short, since n=10 there have been five very high scores around +35 and/ or +36 total points while the

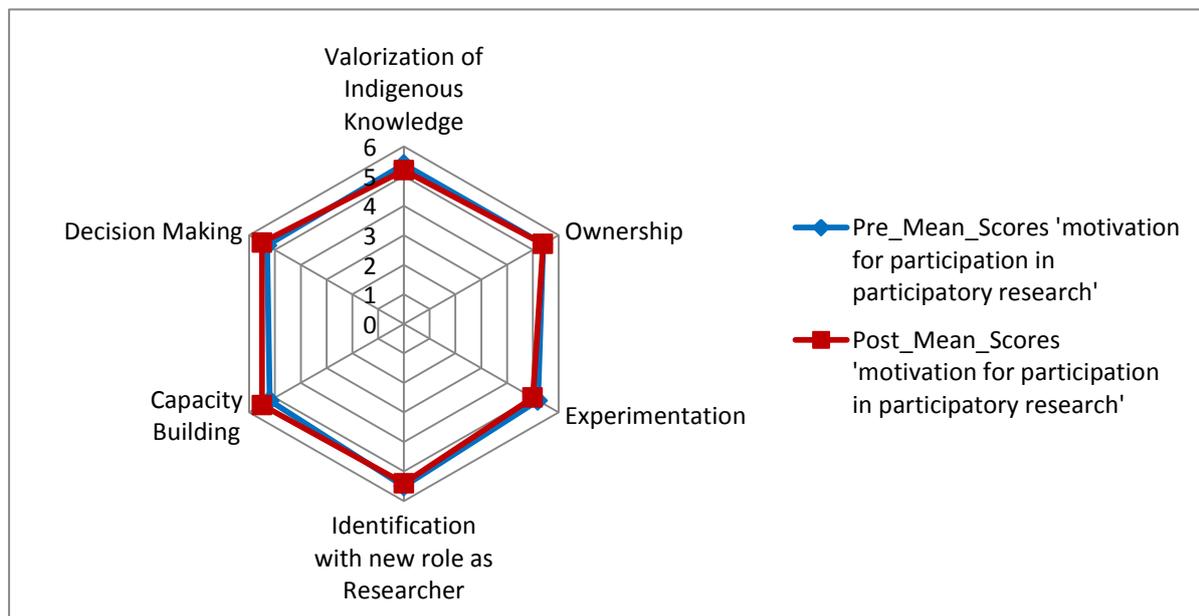
other five measured values diffuse from +35 total points to the minimum of +24 total points in the pre-survey.

In the post-survey the median is situated quite in the middle of the IQR box so that there can be deduced that the measured values distribute more equidistantly within the span of scores. It can be assumed that there is a certain leveling of scores, i.e. an increased frequency of middle or lower scores in the post-survey. This leveling points at a tendency towards the lower scores despite the initially stated unaltered mean score of pre- and post-survey.

In this case the spider chart of single facet scores is sparsely insightful. Therefore, there were no concrete facets to be stimulated during the workshops. Figure 55 shows that the calculated average single facet scores did not change significantly after *basic group 5* has experienced participatory tools although the previous boxplot diagram (figure 54) reveals tendencies towards an increased frequency of medium or lower scores in the post-survey.

In sum, the narrowed range of all measured values in the post-survey that tends towards the higher scores is offset by this tendency of more frequent values measured at the middle and/ or lower scores.

Figure 55: Comparison of mean facet scores of 'motivation for participation' in *basic group 5* (*Choli non-PTD-farmers*)



Source: ZAHUMENSKY 2013

At looking on the data matrix the facets *Capacity Building* and *Decision Making* improved very slightly in *basic group 5*. Due to a raised minimum score and/ or a more frequent scoring at the medium-high scores and / or the absence of very low scores within the 1.5*IQR the facets *Capacity Building* and *Decision Making* show tendencies towards the

higher scores. In contrast and apart from the facet *Ownership* that remained unaltered the rest of the facets record decreased scores in motivation scores due to more frequent lower scores in the post-survey.

Summarized there are almost no changes in the degree of motivation for participation of *basic group 5*.

6.3.1.6 Basic group 6

– **Evaluation of 'basic motivation' (questionnaire part I, facets 1-9)**

Similar to *basic group 5* *basic group 6* is also part of the control group that served for comparison purposes with the group of investigation (*basic groups 1-4*: all PTD-farmers). It was already mentioned that the motivation degrees in the control group were assumed to be the lowest among all surveyed farmers groups due to their few experience with participation in the PTD-project and their assumed low interest in participatory research.

For basic motivation the following statistics could be calculated in table 19. The average total motivation degree in this group is high since the mean scores lie close to the possible optimum of +54 total points.

Table 19: Basic statistical analysis of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 6* (Nimrani non-PTD-farmers)

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part I	8	30.00	49.00	40.38	7.19
Post_Score Part I	8	30.00	43.00	39.38	4.69

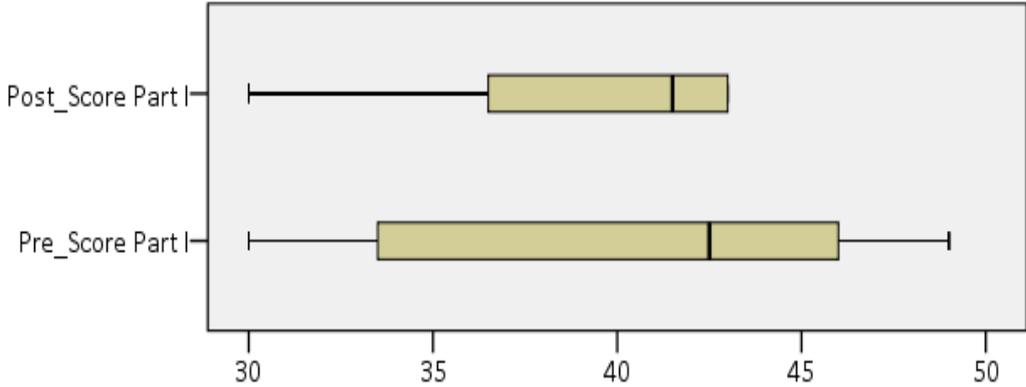
Source: ZAHUMENSKY 2013

Yet, there is a reverse trend in comparison to the distribution of total scores in basic motivation of *basic group 5*. While in *basic group 5* (*Choli* non-PTD-farmers) the mean total score increased in the post-survey the mean total score in *basic group 6* (*Nimrani* non-PTD-farmers) decreases after the group has experienced participatory tools by 1 point from \emptyset +40.38 total points to \emptyset +39.38 total points. Additionally, the range of all measured values records a decrease. A narrowed distribution is underlined by the lower SD in the post-survey that indicates a narrower distribution of values. Unlike *basic group 5* the minimum in the post-survey of *basic group 6* remains with +30 total points whereas the maximum decreases by 6 points from +49 total points to +43 total points. This suggests a lower frequency of very high scores and a general shift of scores towards the medium or lower scores.

In the following boxplot diagram (figure 56) the above observed distribution patterns are given evidence. While the scores in the pre-survey are rather normally distributed with

an IQR of 12.5 points between +33.5 total points and +46 total points the IQR narrowed to a span of 6.5 points between +36.5 total points and +43 total points. That means that in the pre-survey half of the measured values lie within the span of +33.5 total points and +46 total points whereas in the post-survey 50 % of all measured values lie within a more dense range of +36.5 total points and +43 total points.

Figure 56: Distribution of pre- and post-scores in questionnaire part I 'basic motivation' in *basic group 6 (Nimrani non-PTD-farmers)*

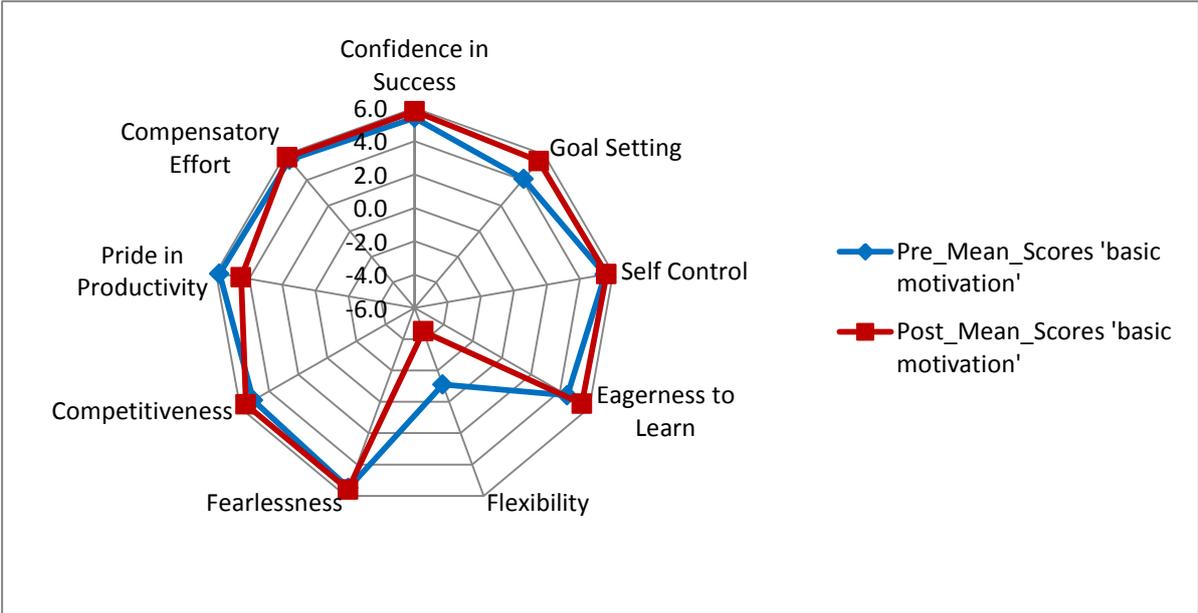


Source: ZAHUMENSKY 2013

Furthermore, the IQR shifts slightly to the lower scores with no more scores outside the right/ upper quartile (3rd quartile). From this follows a left-skewed distribution in the post-survey that is associated with a more frequent scoring around the lower scores around +42 total points. In contrast, in the pre-survey there is still at least one value around the +49 total points.

In sum, the scores of basic motivation of *basic group 6* do not only represent a narrowed distribution but they also decrease in the average total score since the frequency of scores seems to have had shifted towards the lower scores. Yet, from the above diagram there cannot be derived changes of single facet scores. The following spider chart figure 57 gives more detailed insights with regard to the scores of single facets of basic motivation in *basic group 6*.

Figure 227: Comparison of mean facet scores of 'basic motivation' in *basic group 6* (Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2013

As the spider chart discloses there are three facets of basic motivation that record potential for improvement in the pre-survey: *Flexibility* (\emptyset -1.1 points), *Goal Setting* (\emptyset +4.1 points), and *Eagerness to Learn* (+4.5 \emptyset points). In the pre-survey the other facets are very close to the maximum of \emptyset +6 points so that there is no indication to especially stimulate them during the workshop. Consequently, the facets *Flexibility*, *Goal Setting* and *Eagerness to Learn* were particularly addressed during the workshops.

After the group has experienced participatory tools it showed differing scoring patterns. The average scores of the facets *Goal Setting* (GS) and *Eagerness to Learn* (EL) increased by 1.4 points (GS) and 1 point (EL). Thus, they can be considered as having been positively stimulated during the workshops. Nevertheless, these improved scores go to the costs of the facets *Flexibility* (FL) and *Pride in Productivity* (PP) which decreased considerably by 3.4 points to a really low score of \emptyset -4.6 points (FL) and by 1.3 points to the relatively lower score of \emptyset +4.5 points (PP).

Summarized, the basic motivation degree in *basic group 6* has decreased although two of the intended facets could be successfully stimulated as in the case of *Goal Setting* and *Eagerness to Learn*. Yet, the decreased scores of *Flexibility* and *Pride in Productivity* offset the improved scores so that the total motivation degree of basic motivation in *basic group 6* worsened after the participants have experienced participatory tools.

– **Evaluation of 'motivation for participation in participatory research' (questionnaire part II, facets 10-15)**

Despite the high degree of motivation for participation the mean total scores in questionnaire part II of *basic group 6* can be denoted as rather lower in comparison to the scores of other surveyed groups although there is a very slight tendency of improvement. Table 20 shows that the minimum increased by 6 points from +16 total points in the pre-survey to +22 total points in the post-survey. At the same time the maximum remained with the optimum of +36 total points. This proves to be a narrowed range of all measured values in the post-survey. The decreased SD of 4.34 points reinforces a narrowed distribution of scores in the post-survey.

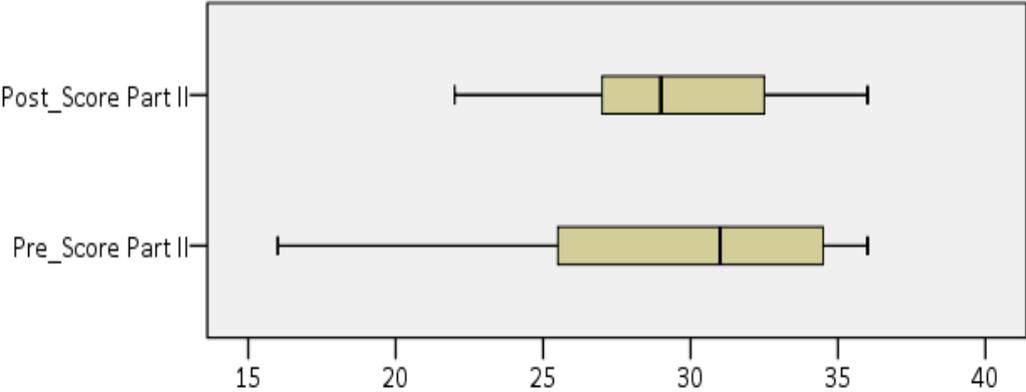
Table 20: Basic statistical analysis of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 6* (Nimrani non-PTD-farmers)

	N	Minimum	Maximum	Mean	Standard Derivation (SD)
Pre_Score Part II	8	16.00	36.00	29.25	6.88
Post_Score Part II	8	22.00	36.00	29.38	4.34

Source: ZAHUMENSKY 2013

Nevertheless, table 20 does not reveal why there is almost no change in the mean total scores despite the narrowed range of scores, the unaltered maximum in the post-survey, and despite the obvious shift of the range of all measured values towards the higher scores. The boxplot diagram (figure 58) allows for more insights in the distribution patterns and changes of total scores of motivation for participation in *basic group 6*.

Figure 58: Distribution of pre- and post-scores in questionnaire part II 'motivation for participation' in *basic group 6* (Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2013

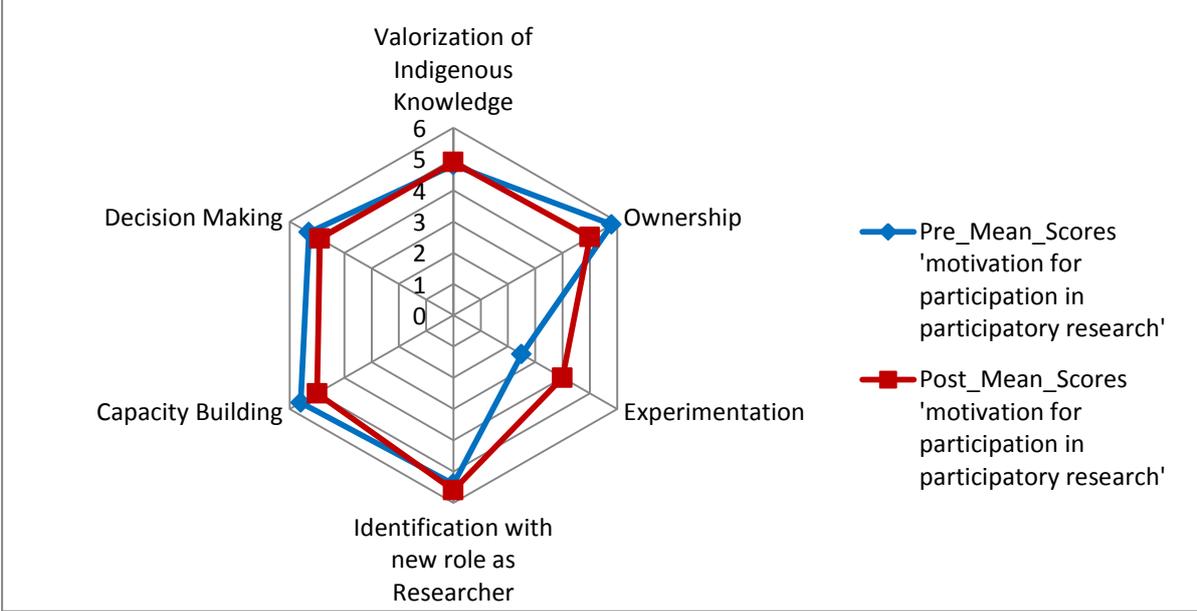
Obviously, there is not only a narrowing of all values but also a narrowing of the IQR in the post-survey. The IQR changes from a range between +24.5 total points and +34.5 total points in the pre-survey to a range between +27 total points and +32.5 total points in the post-survey. This is a decrease by 4.5 points of the IQR span (from a span of 10 points to a span of 5.5 points) after the group has experienced participatory tools. This change results in an almost uniform distribution of scores in the post-survey while the distribution in the pre-survey was rather left-skewed with an assumed higher frequency of higher scores in the pre-survey. The shorter distance of the box and whisker at the right side of the median (upper/3rd quartile and upper whisker) is a sign for that.

In addition, in the post-survey the median shifted to the left, i.e. towards the lower scores so that, in sum, it can be derived that in the post-survey half of the measured values generally condense as well as they condense around lower total motivation scores. Hence, despite the tendency of a narrowed range of all measured values towards the higher scores, 50% of the measured values rather tend towards the lower scores within the IQR.

At looking at the single facet scores of motivation for participation the spider chart below (figure 59) presents a clear picture of the distribution of scores in *basic group 6*. At a glance one can observe the relative lowering of scores per facet in the post-survey. Exceptions are the facet *Identification with new role as Researcher* which shows almost constant high scores of \emptyset +5.4 points in the pre-survey and \emptyset +5.6 points in the post-survey, as well as *Valorization of Indigenous Knowledge* that increases by 0.1 point from \emptyset +4.8 points in the pre-survey to \emptyset +4.9 points in the post-survey.

With regard to other remaining facets of motivation for participation the pre-survey reveals low scores most notably for the facet *Experimentation* that records only \emptyset +2.5 points in the pre-survey. In addition, the facets *Valorization of Indigenous Knowledge* (VIK) and *Identification with new role as Researcher* (IR) can be considered as in need of improvement while the other facets are quite close to the maximum of \emptyset +6 points. Hence *Experimentation*, *Valorization of Indigenous Knowledge* and *Identification with new role as Researcher* were intended to be explicitly addressed during the workshops.

Figure 59: Comparison of mean facet scores of 'motivation for participation' in *basic group 6* (Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2013

In the post-survey the scores of three facets show a decrease. The basic participation facets *Decision Making*, *Capacity Building*, and particularly the facet *Ownership* show lower scores in the post-survey. One of the especially addressed low-score facets that is at the same time highly relevant for the PTD-project (the facet *Experimentation*), could be stimulated very positively and records an increase of 1.5 points from $\bar{x} +2.5$ points to $\bar{x} +4$ points. The other two facets that were explicitly addressed during the workshops record no or almost no change.

In short, there can be stated a trend towards a more consistent distribution of single facet scores in the pre-survey whereat the significant improvement of one highly PTD-relevant motivation facet (*Experimentation*) is offset by slight decreases in the three other general facets of motivation for participation. Other PTD-relevant facets could not be stimulated even though one of them (*Valorization of Indigenous Knowledge*) recorded potential for improvement. The offset tendency of the differing facets results in an unaltered total mean score in the pre- and post-survey.

6.3.1.7 Comparison of motivation degrees

In the previous chapter the results of the questionnaire about motivation degrees have been illustrated in detail for each *basic group* before and after the farmers have experienced participatory tools (pre- and post-survey). Distribution patterns of motivation scores in total as well as average scores per facet were highlighted. Group-wise low-score facets were identified and characterized as facets that had to be especially stimulated during the participatory workshops. At comparing the total and average facets scores of the pre- and post-survey (motivation degrees are the higher the higher the total scores/ average facet scores) it became clear that some groups showed few changes in their motivation degrees while some groups showed more significant changes. Furthermore, it could be worked out in which questionnaire part (part I 'basic motivation' or part II 'motivation for participation') each group had more significant variances.

The perspective will now be broadened again to the overall comparison of group-wise average motivation scores for two reasons. On the one hand, the empirical results shall be compared with the presumptions or hypotheses that have been made before the case study has been realized. More precisely, this means basically to verify the assumed hierarchical distribution of motivation degrees between the investigated *basic groups* instead of comparing scoring patterns within those. On the other hand, the implicit general assumption that the total motivation scores could be positively stimulated (= increase of the total scores) during the workshops will be proven.

In the same procedure as the previous comparison of scores within the different groups the following graphs (figure 60, 61, and 62) illustrate average total scores per group in order to easily compare them between the groups before and after the participatory workshops have been realized. Moreover, they visualize changes of each questionnaire part (part I or part II) as well as changes of the summarized motivation degree (=summarized motivation scores of part I and part II) per *basic group*. The figures also allow for the derivation of a ranking of groups according to their motivation degree before and after they have experienced participatory tools. In addition, it can be identified which group shows the most significant changes in total motivation, and in 'basic motivation' or 'motivation for participation', respectively.

– **General observations about the measurement of motivation degrees: unexpected scoring patterns and their explanation**

First of all, evidently there have been changes in motivation degrees in the pre-and post-surveys. From this follows that varying motivation degrees could be assessed by means of the standardized questionnaire as it delivered units for the calculation of motivation degrees and their group-wise comparison. The measuring tool that based on the ACHIEVEMENT MOTIVATION INVENTORY (AMI) according to SCHULER & PROSCHASKA 2001 proved to be an adequate instrument for the retracement of changes in motivation of the investigated

groups since it delivered lots of data about motivation. Objective 1 ('Data about motivation') as well as objective 6 ('Evidence about PTD-impact') were achieved.

At looking on the different motivation degrees the categorization of farmer groups according to motivation types that were assumed before the case study could not completely be strengthened by empirical results. In particular, the imagination of motivation types as clear hierarchical structure cannot be unconditionally consolidated. At a glance, the figures 60, 61, and 62 reveal that there is no simple hierarchy of motivation types because if there was a hierarchy among the investigated farmer groups as it was imagined before the case study the bars in the graphs should have declined from the left to the right with the PTD-farmers of *Amlatha* village as most advanced, highly motivated and pro-active *basic group* and the non-PTD-farmers of *Nimrani* village as the inexperienced, less motivated and rather passive *basic group*. Although the initially presumed hierarchical structures seem to be applicable to *basic groups* 1 to 3 none of the figures 60, 61 or 62 corroborates the belief of a hierarchy of motivation types of *all* investigated groups.

At looking at the motivation scores of the control group in all figures that compare average motivation scores of questionnaire part I, part II and summarized for part I+II, one can observe unexpected but general and relatively high scores of the groups that have been assumed as less motivated. These are *basic groups* 4 to 6: the PTD-farmers of *Nimrani* village, as well as the non-PTD-farmers of *Choli* and *Nimrani* village. The scores of these groups are throughout similar or even higher than the scores of the groups that were assumed to be more motivated (*basic groups* 1 to 3). Consequentially, *basic groups* 4 to 6 should be judged as more motivated than *basic groups* 1 to 3.

Yet, the results of the qualitative evaluation as well as the informal observations point at the opposite since the observed participation, i.e. the presence of non-PTD-farmers during the PTD-workshops, decreased throughout the workshop phase as well as during the single workshops. Discussions and exchange in the control group generally were not as animated as in the group of investigation, and it could be observed that the willingness of farmers to respond the standardized questionnaire twice (pre- and post-survey) was lower in *basic group* 4 to 6 than in *basic group* 1 to 3. Especially the non-PTD-farmers had to be requested more emphatically to respond the standardized questionnaire. The high loss of participants in the control group during the workshop phase was already mentioned elsewhere. Hence, it cannot be deduced that the control group of non-PTD-farmers and the PTD-farmers of *Nimrani* village (that were assumed to be the less motivated PTD-farmers) are as much or even more motivated as the group of investigation. A number of indicators reinforces this interpretation that is based on the presumed attitudes of respondents as well as on their derived response behavior¹⁵⁹.

¹⁵⁹ The derivation of a generalized response behavior that is assumed to having influenced the scoring results of a selected basic motivation facet is discussed in detail in chapter 7 (discussion of results) since it bases exclusively on assumptions and indicators.

One explanation for the high scores of the control group and the PTD-group that was assumed to be the less motivated PTD-group (*basic group 4*) is that the more advanced PTD-farmers of *basic groups 1 to 3* tend to a more reflected and more critical thinking so that their answers during the questionnaire (pre- and post-survey) turned out to be more critical with resulting lower scores. Whereas the answers of the control group and the less motivated PTD-group (*basic group 4*) can be assumed as having been less reflected and less critical with the result that they record relatively high scores. Consequently, they can be characterized as indicating actually lower motivation degrees despite their empirically evident higher scores. In view of the cultural conditions of the research area that have already been addressed elsewhere this is in fact not an erroneous assumption. An uncritical attitude, the unquestioned acceptance of hierarchies, as well as tendencies of delivering answers that are guessed to be expected answers by outsiders are common behavioral patterns of local habitants that may result in *social-desirability-response-sets*. From this perspective, the high scores of the less motivated farmers can be considered as 'hidden low scores' that resulted mainly from vigorously affirmative answers during the pre- and/ or the post-surveys (*acquiescence tendency*). Interpreting the high scores of the less motivated groups as 'hidden low scores' avoids a distortion of the results, minimizes the systematic error source of item response, increases the validity of items, and takes into account the complex cognitive processes that occur during the reply of test questions. (cf. ROST 2004: 66f; MOOSBRUGGER & KELAVA 2012: 57ff.)

Another indicator for an actually lower motivation degree in the control group and the less motivated PTD-group (*basic group 4*) is the observable tendency to a decreased motivation score in the post-surveys of each of the *basic groups 4 to 6*. This tendency can be observed in all figures that compare the total motivation degrees (figures 60, 61 and 62). All of the figures show unaltered or decreased bars in the post-surveys rather towards the right side of the figure, i.e. towards the less motivated farmers. In contrast, *basic groups 1 to 3* that were assumed to be the most motivated groups generally show rather increased scores in the post-surveys. From this it can be derived that the more motivated groups seem to have in fact increased total motivation degrees in the post-surveys because they had an already more critical and reflecting attitude in the pre-surveys (hence their pre-scores were lower than in *basic groups 4 to 6*), whereas the less motivated groups are assumed to first of all having improved their critical thinking and reflecting attitude throughout the workshop phase with the result of lower post-scores.

It is very important to keep in mind that 'conscientization' and critical thinking can indeed also be a result of the stimuli of participatory tools. Thus, such decreased scores should not be considered as failure, but also as success of the applied participatory tools. The situation is just that improved motivation degrees represent an advanced success of the participatory methods compared to the generation of critical attitudes that represent rather the acquisition of basic skills and as a basis for the improvement of motivation degrees. The

latter should be considered as precedent process that can lead to improved motivation scores provided that the stimuli of participatory tools continue. Against this backdrop, the 'hidden low scores' of the less motivated *basic groups* 4 to 6 are not to be considered as failure of the participatory workshops per se. To the contrary, they should be characterized as successful 'conscientization'.

Another important aspect of general observations about the measurement of motivation degrees refers to the imagined separation line between the group of investigation and the control group, i.e. the separation line between more motivated and less motivated *basic groups*. Contrary to the expectations, the imagined separating line that separates the groups which, according to the latest findings, are assumed to show increased motivation scores and the groups that are assumed to show improvements in the more basic skills of critical consciousness is not to be located at the border of PTD-farmers and non-PTD-farmers. Rather the PTD-group that was assumed to be the less motivated PTD-group (*basic group 4*) generally seems to correspond rather to the scoring patterns of the control group than to the scores of the PTD-groups. Hence, the separating line should be imagined as separating the more motivated *basic groups* 1 to 3 from the less motivated *basic groups* 4 to 6. This shifted separating line is marked with a broken line in figure 60, 61 and 62.

As it became obvious, the results of the measurement of motivation degrees generally turned out to be difficult to interpret due to the complex cognitive processes that still remain vague as well as due to unexpected scoring patterns. For these reasons the following statements will focus mainly on the tracking of patterns of changes according to differently motivated *basic groups* and according to whether changes occurred rather in questionnaire part I ('basic motivation') or in questionnaire part II ('motivation for participation'). Debatable or speculative interpretations will be discussed more detailed in chapter 7.

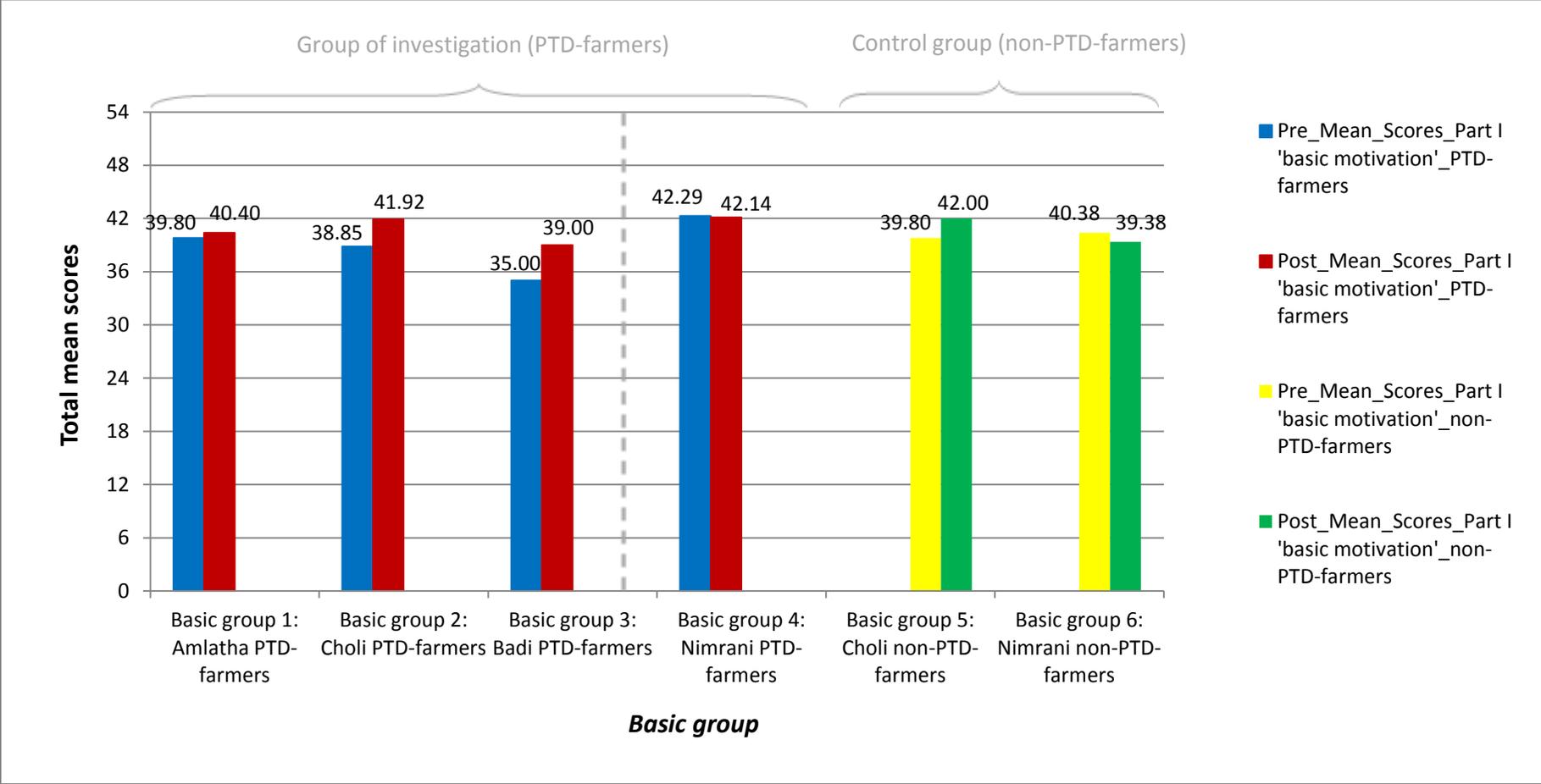
– **Comparison of degrees of 'basic motivation' (questionnaire part I)**

The first synopsis of empirical results of 'basic motivation' (figure 60) contrasts the total motivation scores per *basic group* in the pre- and post-survey of questionnaire part I. The group of investigation (PTD-farmers) is separated from the control group (non-PTD-farmers) by different colors.

First of all, it can be observed that *basic groups* 1 to 3 are arranged according to a hierarchic structure as it was presumed before the case study. Among these most advanced groups the PTD-farmers of *Amlatha* village who were supposed to be the most motivated farmers record the highest motivation scores in the pre-survey, as expected closely followed by the PTD-farmers of *Choli* village, and PTD-farmers of *Badi* village. The PTD-farmers of *Nimrani* village fall out of alignment and their relative high scores can be considered as 'hidden low scores' as it has already been explained. Following this explanation model *basic*

group 4 can be allocated to the less motivated group because its scoring patterns correspond rather to the control group of non-PTD-farmers. In the following the scoring patterns for basic motivation will be described according to the separation of groups on the left (most motivated groups) and on the right side (least motivated groups) of the corrected separation line (broken line).

Figure 60: Comparison of total mean scores of questionnaire part I 'basic motivation' (all investigated groups)



Source: ZAHUMENSKY 2013

Basic motivation of basic groups 1 to 3

For the pre-survey, *basic groups 1 to 3* can be designated as showing high basic motivation scores since the average scores around +38 total points lie close to the optimal score of +54 total points for questionnaire part I ('basic motivation'). However, in the pre-survey the scores still show potential for improvement, and thus, improvement in the pre-survey was expectable. Moreover, *basic groups 1 to 3* display declining scores in the expected sequence where the PTD-farmers of *Amlatha* village present the group with the highest motivation scores, the PTD-farmers of *Choli* village present the group with the second highest motivation scores, and the PTD-farmers of *Badi* village present the group with the third highest scores.

The scores of the post-survey throughout show increased basic motivation degrees. Since the scores in the pre-survey of the *Amlatha* PTD-farmers were already high in comparison to the *Badi* PTD-farmers the former increased only by +0.6 points while the post-scores of the latter increased by +4 points. With an increase of +3.07 points the post-scores of the second ranked *Choli* PTD-farmers lie between the two.

In general it can be stated that the group of investigation without *basic group 4* records increased scores of basic motivation after the group members have experienced participatory tools. Furthermore, the following regularity can be observed: the lower the basic motivation degree in the pre-survey, the higher the degree of improvement in the post-survey. This trend resulted in an approximation of the basic motivation scores of the investigated group of PTD-farmers (without *basic group 4*). Although theoretically there was potential for still higher scores in basic motivation in both pre- and post-survey the stimulation of basic motivation facets can be judged as having been successful in the case of *basic groups 1 to 3*. A close approximation of motivation degrees close to the optimum of +54 total points is probably unrealistic and not achievable in practice. Therefore the degree of increase is judged as very successful.

Basic motivation of basic groups 4 to 6

The scores of these groups are more difficult to interpret since they do not follow obvious patterns. At least it can be stated that they generally display equal or even higher scores as the most motivated *basic group 1* in the pre-survey. Two of the groups show almost constant or declining total basic motivation scores in the post-surveys. Decreased scores in the post-survey are indicators for an improved consideration during the responding process as well as for a more conscious attitude. Besides, the higher total mean scores in both pre- and post-survey are explicable as 'hidden low score' which thus would fit in the concept of assumed declining motivation degrees from the left to the right side of figure 60.

Due to the complex and the non-transparent cognitive processes it is not possible to definitely clarify whether *basic group 5* actually records an increase of its total motivation score by +2.2 points. Yet, the assumption can be suggested because *basic group 2* and *basic*

group 5 show very similar scores and changes in scores. Thus, a parallel can be drawn between them. Fact is that both *basic groups* are from *Choli* village. Informal observations revealed that exchange, networking and ways of communication are very established in *Choli* village. For this reason it is thinkable that the non-PTD-farmers of *Choli* village were and still are in close contact with the PTD-farmers of *Choli* village and that they therefore were already well informed about the PTD-project. Furthermore, the high basic motivation of the PTD-farmers of *Choli* village might have spread to the non-PTD-farmers of *Choli* village due to close social networks. Finally, it is possible that the *Choli* non-PTD-farmers from the beginning were underestimated in their motivation degrees and falsely classified in the research design. However, due to their similar scores to the *Choli* PTD-farmers as well as due to the pattern of an increased score in the post-survey *basic group 5* can be imagined as matching rather alongside the *Choli* PTD-farmers than to the less motivated groups.

On the other hand, the remaining *basic groups 4* and *6* follow the patterns of unaltered or declining motivation degrees in the post-survey. Among the as less motivated characterized control group on the right side of the imagined separation line the PTD-farmers of *Nimrani* village are thought as most motivated farmers group while the non-PTD-farmers of *Nimrani* village are assumed to record the lowest motivation degrees. Under exclusion of *basic group 5* for the above mentioned reasons this pattern turns out to apply. At recollecting the results of the scoring patterns of the respective groups in chapter 6.3.1.4 and 6.3.1.6 the unaltered scores of *basic group 4* in pre- and post-survey resulted from the de facto absence of significant changes in scores of single facets and not from changes in single facet scores that offset each other. The declined scores in the post-survey of *basic group 6* are primarily attributable to decreased individual's scores in the facet *Flexibility*¹⁶⁰. The descending sequence of *basic group 4* and *basic group 6* appears plausible: the group with the unaltered scores can be judged as less unmotivated as the group with the decreased post-scores.

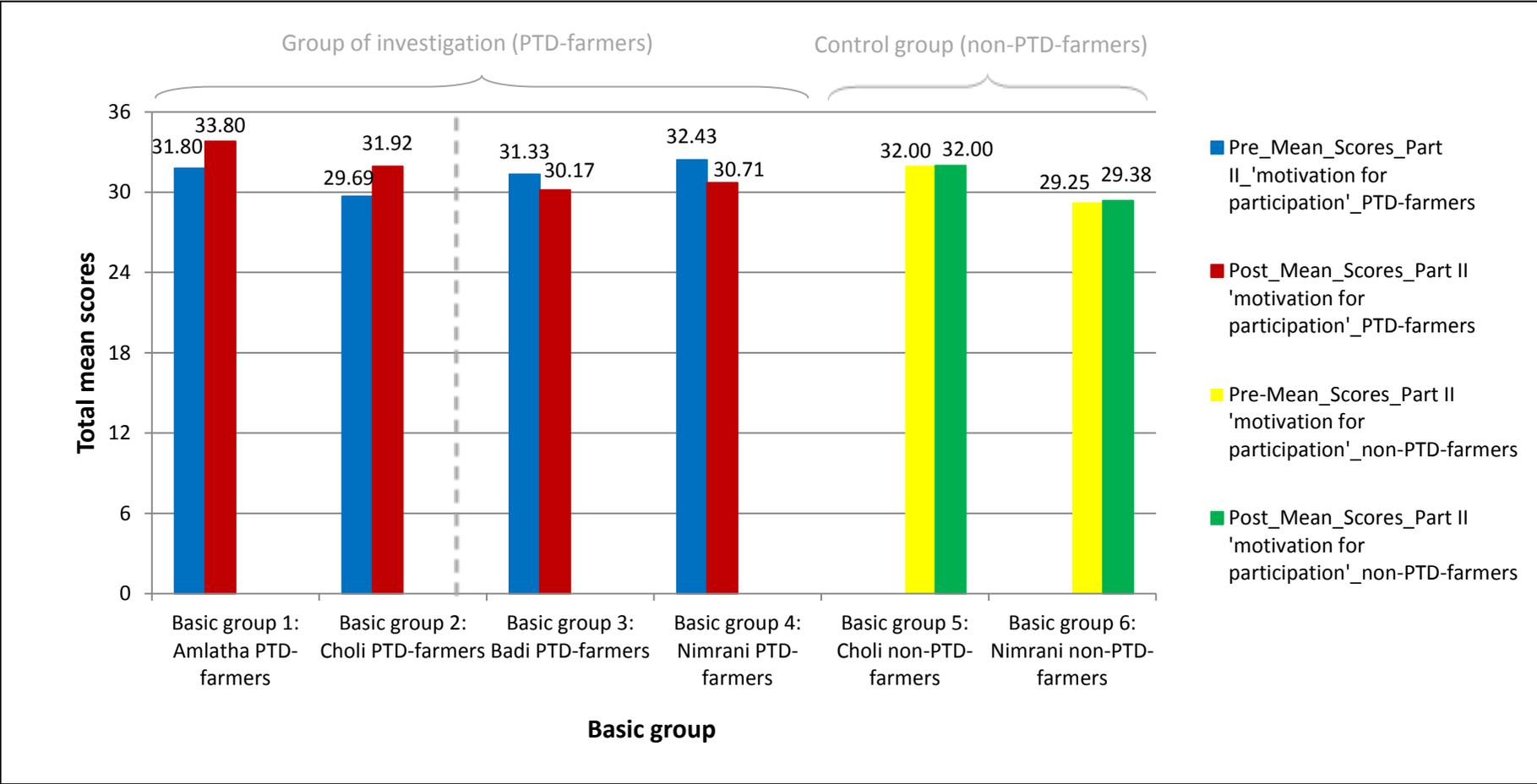
Briefly recapitulated, the resulting thumb rule is that the basic motivation degrees of the group of investigation increased after they have experienced participatory tools while the less motivated groups rather decreased in their basic motivation degrees. Both changes are considered as positive results whereas the first can be characterized as advanced result and the latter as more elementary changes that build a basis for the advanced improvement of motivation scores. By the end of the workshops the post-scores of all *basic groups* approximated due to an increasing tendency among the more motivated farmers and a decreasing tendency of the less motivated farmers with the result that all post-scores leveled out at similar motivation degrees. This suggests a homogenization process of motivation degrees of all *basic groups* after they have experienced participatory tools.

¹⁶⁰ For detailed disputable aspects of the facet *Flexibility* see chapter 7.3.

– ***Comparison of degrees of 'motivation for participation' (questionnaire part II)***

Figure 61 reveals other scoring results of motivation for participation that are less clear than the scoring results of basic motivation. But it is salient that the motivation degrees are generally higher in motivation for participation than in basic motivation. All groups record scores that lie very close to the optimum of +36 total points in the pre- as well as in post-survey. In addition, the scores between more and less motivated groups according to the hierarchy that was assumed before the case study do not vary significantly. However, some trends can be observed that will be addressed in the following.

Figure 61: Comparison of total mean scores of questionnaire part II 'motivation for participation' (all investigated groups)



Source: ZAHUMENSKY 2013

Motivation for participation of basic groups 1 and 2

In the first instance, the separation of high motivated and low motivated groups through the imagined corrected separation line cannot be maintained but ought to be shifted to the left. Only the most advanced and most experienced PTD-farmers of *Amlatha* and *Choli* village record increased scores of motivation for participation in the post-survey. Since these two *basic groups* from the beginning were assumed to be the most advanced and most motivated groups that already have experienced one PTD-project cycle with the observations and discussion of PTD-results and/ or PTD-benefits their improved scores can be judged as de facto increase of motivation for participation in the PTD-project. Their relatively lower pre-scores are most probably the result of an already more reflected response behavior.

Moreover, the knowledge about the possible benefit of the PTD-project that those farmers obtained through the past PTD-cycle probably increased their motivation for participation. Besides, the conveying of the idea that participatory tools can even increase the benefits of the PTD-project and that participatory working was intended to be integrated more systematically into the FiBL/ bioRe PTD-research (these aspects were tried to be conveyed to the participants of the participatory workshops) can be interpreted as having stimulated the interest in participation of *basic groups 1 and 2*.

Another general observation is that despite the increased post-scores of *basic groups 1 and 2* their pre-scores are superseded by other less motivated groups. Reasons for that will be addressed in the following.

Motivation for participation of basic groups 3 - 6

The phenomenon of relatively higher scores of the less motivated groups is the same as in the comparison of basic motivation degrees and it can be interpreted as 'hidden low scores'. They are suggested to result from the already mentioned *acquiescence tendency*: choosing predominantly the first of all available answer categories or choosing the answer category that was guessed to be expected ('I strongly agree') due to social desirability aspects or due to adapted behavior. There are two ways of interpreting the higher scores in the pre-survey in contrast to the decreased scores in the post-survey in motivation for participation of *basic groups 3 to 6*.

During the interpretation of results of the basic motivation part the presumption was made that the formerly less motivated groups have let stimulate their reflecting attitude through participatory tools. This presumption is assumed to extending to the scores in questionnaire part II ('motivation for participation'). Hence, it applies to the bars of figure 61 that decreased post-scores indicate a more critical response behavior in the post-survey of *basic groups 3 to 6*. This explanation model is applicable for any *basic group* be it PTD-farmers or non-PTD-farmers. However, it is important to keep in mind that decreased post-

scores due to a more critical response behavior differ from a de facto decrease of motivation.

The second explanation model establishes correlation of the lower post-scores with the aspects of experience with the PTD-project. PTD-experience in connection with low scores seems to be explicitly relevant for the evaluation of motivation for participation. Based on such a connection it is thinkable that at least for the PTD-farmers (*basic groups 3 and 4*) the degrees of motivation for participation de facto decreased due to deterrent effects of the first realization of the duties that are associated with the participation in the PTD-project (time consuming monitoring and evaluation of the on-farm experiments, documentation of observations, discussing results, and spending lots of extra effort while there is no guarantee for success of the PTD-experimentation). *Basic groups 3 and 4* are assumed to having internalized those PTD-duties during the workshop phase.

The argument of deterrent effects is not far-fetched if we recall the remarks during the qualitative evaluation that refer to the very common farmers' attitude of the delivery of simple and fast solutions to their problems. In the qualitative evaluation the desire and the necessity of a high degree of individual engagement in the PTD-project seem to surprise and deter inexperienced PTD-farmers. Once they experience the benefits of such high engagement they are assumed to be less deterred so that degrees of motivation for participation can increase. In the case of the most motivated and most PTD-experienced *basic groups 1 and 2* this process of acknowledging the crucial role of individuals' engagement is presumed to have already taken place. Whereas the less PTD-experienced and less motivated groups of PTD-farmers still show more skeptical attitudes towards a participation in the PTD-project that result in decreased post-scores. It appears more logical that this latter explanation model is rather applicable to the PTD-farmers than to non-PTD-farmers since a strong deterrent effect can only evolve out of a realization of unexpected duties that will surely come up to a PTD-farmer. The deterrent effect is illustrated for *basic groups 3 and 4* in the following.

At looking at the results of the evaluation of single facet scores of motivation for participation of *basic groups 3 and 4* in chapter 6.3.1.3 and 6.1.3.4 (figures 47 and 51) it becomes evident for *basic group 3* that the motivation degree of the facet *Experimentation* increased in the post-survey (i.e. a higher motivation for experimentation per se). But at the same time the post-scores of the facets that are highly relevant for the PTD-project (*Ownership, Capacity Building and Identification with the new role as Researcher*) decreased. Hence, a deterrent effect of the accompanying demands of the PTD-project seems obvious for *basic group 3* despite a general high interest in the PTD-research.

For *basic group 4* there can be observed a de facto decrease of the facet *Experimentation, Ownership and Capacity Building* but an increase in the facet *Valorization of Indigenous Knowledge and Identification with new role as Researcher*. These patterns are interpretable as increased motivation for independent and self-reliant solution finding and a

general willingness to get active in form of surveying the conditions of the own field like a researcher. But on the other side, accompanying demands of the PTD-project such as taking over responsibility and controlling the project, spending time for learning how to conduct and experiment, how to exchange about results, and how to document them, etc. seem to be undesired so that the motivation degrees decreased after the group members have obtained more insights into the functioning of the PTD-project.

Non-PTD farmers will probably also be deterred but they are ought not to bother much about such duties since they will not come up to them. Hence, it can be derived that the degree of lowering of the post-scores of the non-PTD farmers is not as high as the lowering degree of the PTD-farmers since the latter are assumed to reflect a constant skeptical attitude towards the PTD-project before and after the participatory workshops. Their total motivation degrees logically do not differ much between pre- and post-survey. If there is modification of scores within a *basic group* of the control group at all it is most probably offset by shifted single facet scores.

In *basic group 5*, for example, the scores for the facet *Experimentation* even worsened despite the general motivation to participate for the purpose of general benefits of participation (*Decision Making, Ownership*) increased. The participatory workshop could not awake interest in experimentation but in general benefits of pro-active participation. For this reason *basic group 5* can be interpreted as having increased awareness and as at least being motivated to participate in time-consuming capacity building activities. *Basic groups 6*, in turn, revealed increased motivation for *Experimentation* after having obtained more information about the PTD-project but at the same time they record lower motivation degrees in the post-scores for general participation facets such as taking over responsibility and decision making or spending time for capacity building. Hence, they can be characterized as being more interested in the PTD-project after they have experienced participatory workshops but they are deterred from the accompanied efforts.

At the end it is very likely that the low post-scores of the *basic groups* on the right side of the imagined separation line result from a mixture of both explanation models, i.e. from a combination of a more critical attitude/ awareness as well as from a deterrent effect of PTD-duties in the post-survey.

– **Comparison of degrees of the total motivation degree (questionnaire part I + II)**

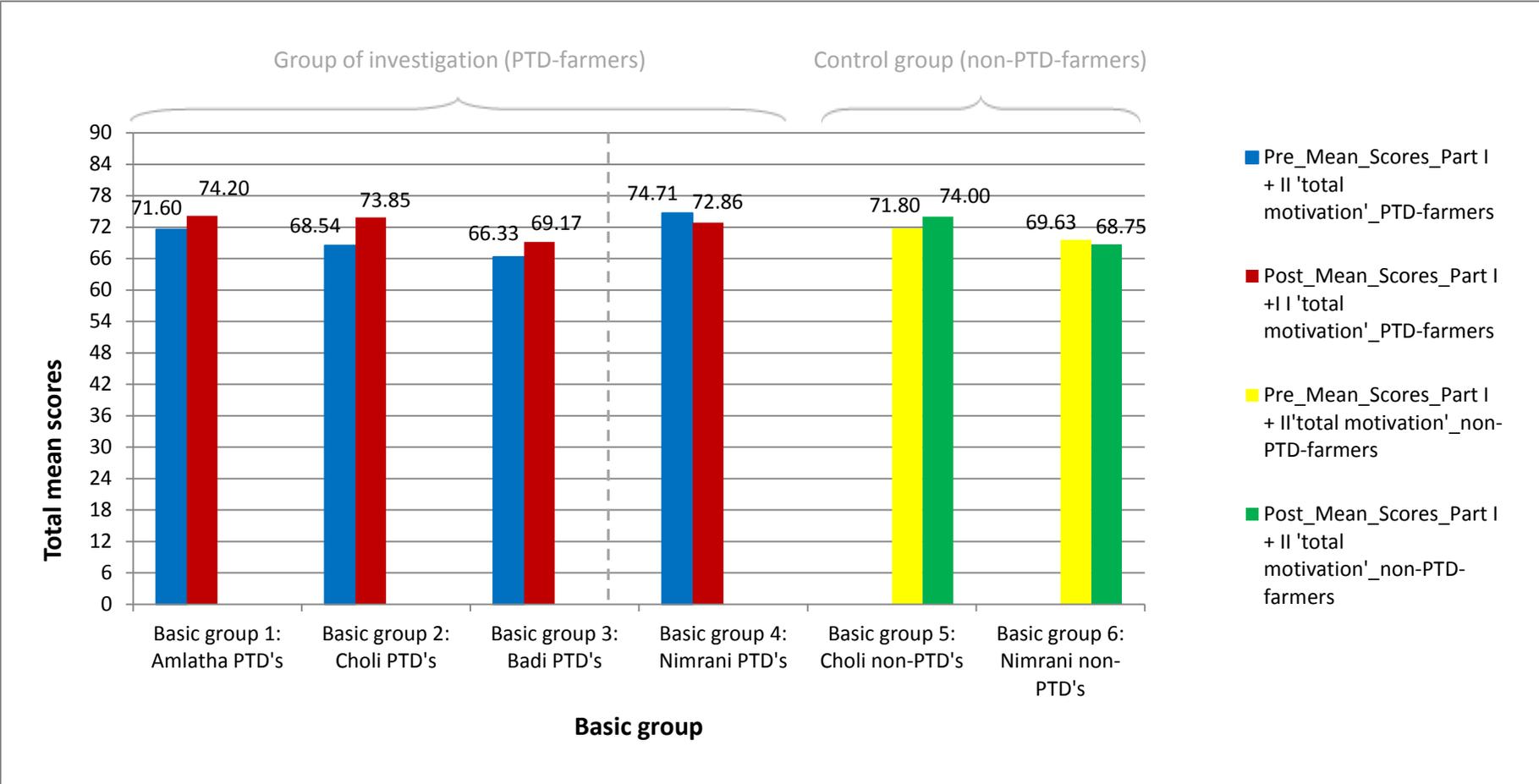
The degree of total motivation is the result of the summarized average motivations scores of 'basic motivation' and 'motivation for participation'. Likewise the separate illustration of the two questionnaire parts this comparison (see figure 62) finally encompasses the general tendencies of motivation degrees per *basic group* before and after the participants have experienced participatory tools. It thus outlines leveled motivation scores that allow for more universal statements.

The scores of the preceding comparisons of the single questionnaire parts have generally been judged as high or very high. Consequently, the summarized total motivation degree of all *basic groups* can also be characterized as very high since on a scale of possible - 90 and + 90 total points they all lie close to the optimum of + 90 total points for the external assessment part (questionnaire part I and II).

The separation of *basic groups* into two categories to the left and to the right of the corrected separation line is more akin to the scoring patterns of basic motivation degrees (questionnaire part I). Hence, the separation of *basic groups* 1 to 3 (most motivated) versus *basic groups* 4 to 6 (less motivated) can be maintained. Similar to the previous comparisons of scores *basic group* 4 can be allocated to the less motivated group for reasons that have already been elaborated before ('hidden low scores', a characteristic response behavior of *acquiescence*, lowering of scores in the post-survey, etc.).

Finally, it is observable that both group categories show hierarchical scoring patterns with declining total scores in the pre- and post-survey from the left to the right (except *basic group* 5). Again, the scores of the less motivated groups (including *basic group* 4 - the less motivated PTD-farmers group) are predominantly higher in the pre-surveys than the pre-scores of the more motivated groups. Whereas in the post-survey the more motivated groups rather supercede the post-scores of the less motivated groups.

Figure 62: Comparison of total mean scores questionnaire part I and II 'total motivation' (all investigated groups)



Source: ZAHUMENSKY 2013

Total motivation of basic groups 1 to 3

In both pre- and post-survey the most motivated groups show a gradual decrease of motivation degrees according to the hierarchy that was theorized before the case study has been realized. The PTD-farmers of *Amlatha* village (*basic group 1*) lead the ranking followed by the PTD-farmers of *Choli* village and *Bad* village. *Basic groups 2* and *3* present a relatively higher increase in scores in the post-survey than *basic group 1* since they had more potential for improvement due to their relative lower pre-scores than the ones of *basic group 1*. With an increase of + 5.31 points the PTD-farmers of *Choli* village (*basic group 2*) record the highest summarized increase in total motivation degree.

Total motivation of basic groups 4 to 6

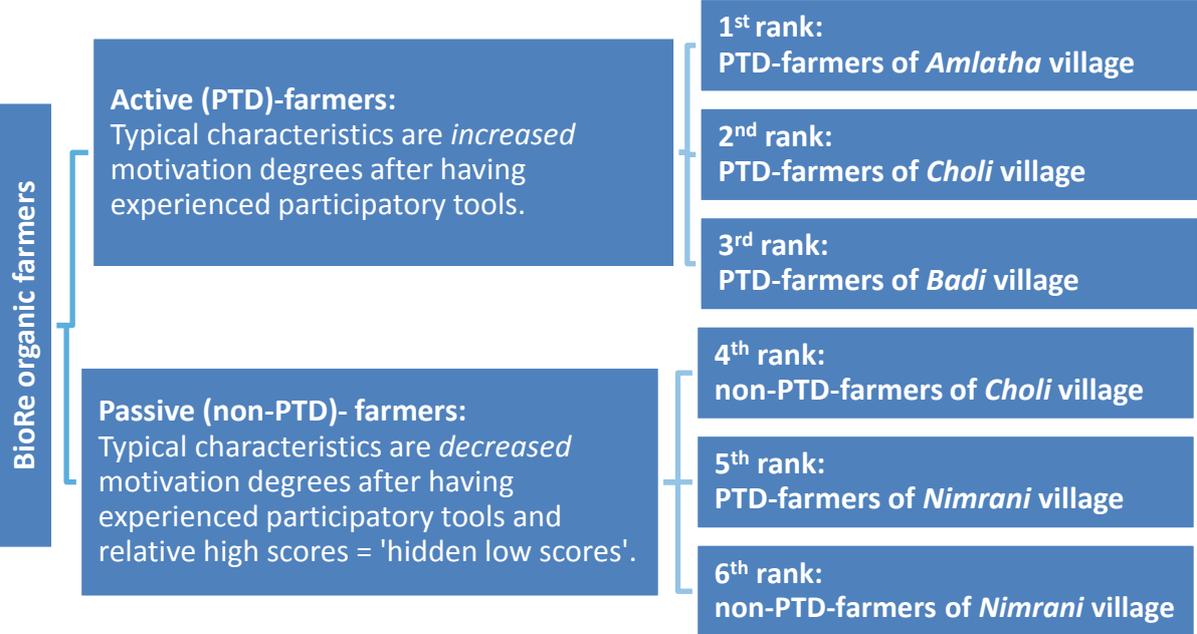
Likewise the scoring patterns of questionnaire part I ('basic motivation') *basic group 4* shows a higher total motivation degree than *basic groups 1* to *3* and hence it does not a priori represent the group with the lowest motivation degrees of the group of investigation (PTD-farmers) although it was supposed to do so. Yet, it rather seems to lead the control group (non-PTD-farmers) where high scores were interpreted as 'hidden low scores' for reasons of lower scores in the post-surveys of the control group that indicate more reflective response behavior than in the pre-survey. Whereas, due to its increased post-scores *basic group 5* matches rather the group of investigation than to the control group even though *basic group 5* records also very high scores that point on 'hidden low scores' and unreflective response behavior.

However, the hierarchy of the control group on the right side of the corrected separation line can be rearranged similar to the hierarchy of the group of investigation where the degrees are assumed to gradually decrease from the left to the right side. *Basic group 5* can be categorized as most advanced group of the control group and thus as leading the ranking of motivation degrees of the control group because it still follows the more advanced scoring patterns of increased post-scores (and hence of an increased total motivation degree). But at the same time it records very high scores that are similar to the scores of *basic group 1*. For the latter reason and due to the fact that *basic group 5* is a group of non-PTD-farmers it must be allocated to the control group. On the second rank there can be allocated *basic group 4* since it records very high scores ('hidden low scores') but already decreasing scores in the post-survey. This indicates an unreflective response behavior in the pre-survey and an incipient critical and more conscious response behavior in the post-survey. Finally, *basic group 6* shows the lowest scores of the control group as well as a decreased post-score. It thus can be attributed the third and last rank of the control group.

Summarized, all *basic groups* can be rearranged according to their total motivation degrees as the following ranking list shows (figure 63). This actual empirically observable categorization concretizes and adjusts the theoretical categorization (see figure 22). Despite

of unexpected scoring patterns there can be identified a hierarchy that is similar to the theoretically assumed hierarchy.

Figure 63: Actual categorization of bioRe organic farmers according to total motivation degrees



Source: ZAHUMENSKY 2013

6.3.2 Self-evaluation

Besides the external assessment of motivation degrees of all targeted groups of the case study before and after they have experienced participatory tools the standardized questionnaire encompassed a self-evaluation part about the nine basic motivation facets. This part was also surveyed twice: once before and once after the participatory workshops. In this third questionnaire part the respondents were briefly explained the nine facets *Confidence in Success, Goal Setting, Self Control, Eagerness to Learn, Flexibility, Fearlessness, Competitiveness, Pride in Productivity, and Compensatory Effort*. On a scale between 1 and 5 points the respondents were asked to judge the intensity of each facet of being a driving force for motivation according to their own estimation (= motivation intensity). While 5 points indicated the highest intensity of being a driving force 1 point indicated the lowest intensity of being a driving force. A total of 45 points thus indicates high total motivation intensity whereas a total of 9 points indicates low total motivation intensity. From the answers there could be derived spider charts per *basic group* that disclose low-score facets as well as changes in the intensity of being a driving force for motivation of each facet.

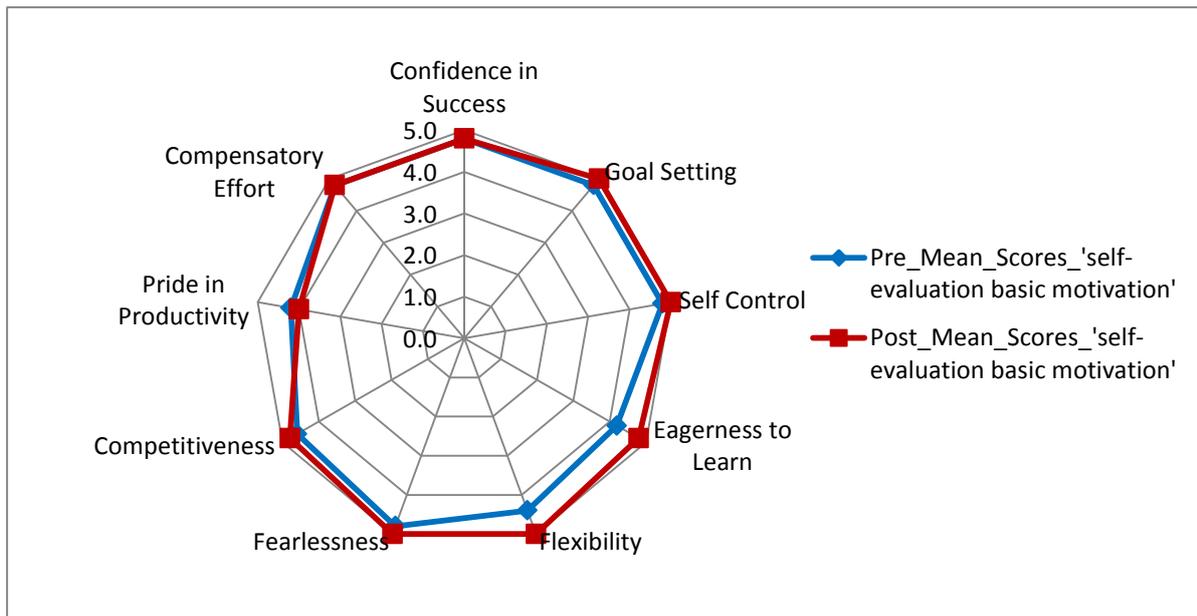
The self-evaluation was designed for the cross-checking of results from questionnaire part I and II. Since the scale of questionnaire part III ('self-evaluation') differs from the scale of questionnaire part I and II the results are not directly comparable. Yet, at least main tendencies of changes in motivation intensities (part III) can be checked against main tendencies of motivation degrees (part I and II). By this way, at least the direction of changes can be validated to some extent. Additionally, a notion about the self-assessment of the investigated farmers groups can be gained.

In the following the mean scores of the self-evaluation will be visualized and briefly explained for each *basic group* in the sequence they have been introduced in table 8. Therefore the results are presented for the pre- and post-survey of each *basic group* in order to detect changes in motivation intensities.

6.3.2.1 Basic group 1

The farmers of *basic group 1* throughout judge the motivation intensity of all facets very high. There is a total increase of the intensity of motivation of all basic motivation facets from \emptyset 41.4 total points to \emptyset 43.2 total points, except for the facet *Pride in Productivity*. According to the self-evaluation the increase results from an increased motivation intensity of the facets *Eagerness to Learn* and *Flexibility*.

Figure 64: Facet scores part III ('self-evaluation basic motivation') of *basic group 1* (*Amlatha* PTD-farmers)



Source: ZAHUMENSKY 2013

The external assessment of basic motivation of *basic group 1* (see figure 37) also showed very high basic motivation degrees except for the facet *Flexibility*. According to the external assessment there were positive changes in the facet *Goal Setting* but negative changes in scores of the facet *Flexibility* and *Pride in Productivity*. The external assessment corresponds to the self-evaluation insofar as *Pride in Productivity* obviously represents the less important facet of basic motivation (its score also decreases in the post-survey of the self-evaluation), and insofar as the total motivation degree/ total motivation intensity increased after the participants have experienced participatory tools. The evaluation of *Flexibility* diverges since in the self-evaluation this facet's intensity is judged as increasing while its motivation degree is judged as decreasing in the external assessment. From this can be followed that the farmers of *basic group 1* admit a high importance of the power of being flexible as a source of motivation but in practice they show relative lower and even decreasing motivation degrees for this facet.¹⁶¹

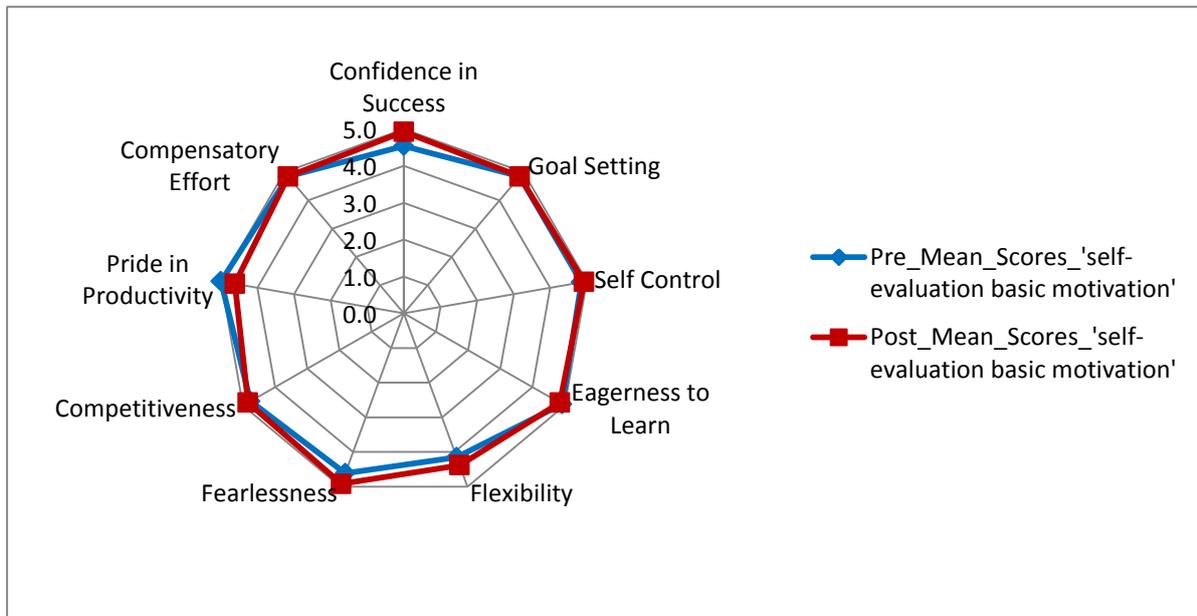
6.3.2.2 *Basic group 2* (*Choli* PTD-farmers)

Likewise *basic group 1* *basic group 2* judges the quality of all facets of being a driving force for motivation as very high in both the pre- and the post-survey. Only the motivation intensity of the facet *Flexibility* is judged relatively lower in both surveys. After having experienced participatory tools the farmers of *basic group 2* judge the motivation intensity of the facets *Confidence in Success*, *Flexibility*, and *Fearlessness* as slightly higher than in the

¹⁶¹ Debatable aspects of the measurement of the facet *Flexibility* will be discussed in chapter 7.3.

pre-survey. Whereas the power of motivation of the facet *Pride in Productivity* is judged lower in the pre-survey. However, altogether, there is a slight total increase of all estimated facets by +0.6 points from \emptyset +42.5 total points to \emptyset +43.2 total points.

Figure 65: Facet scores part III ('self-evaluation basic motivation') of *basic group 2* (Choli PTD-farmers)



Source: ZAHUMENSKY 2013

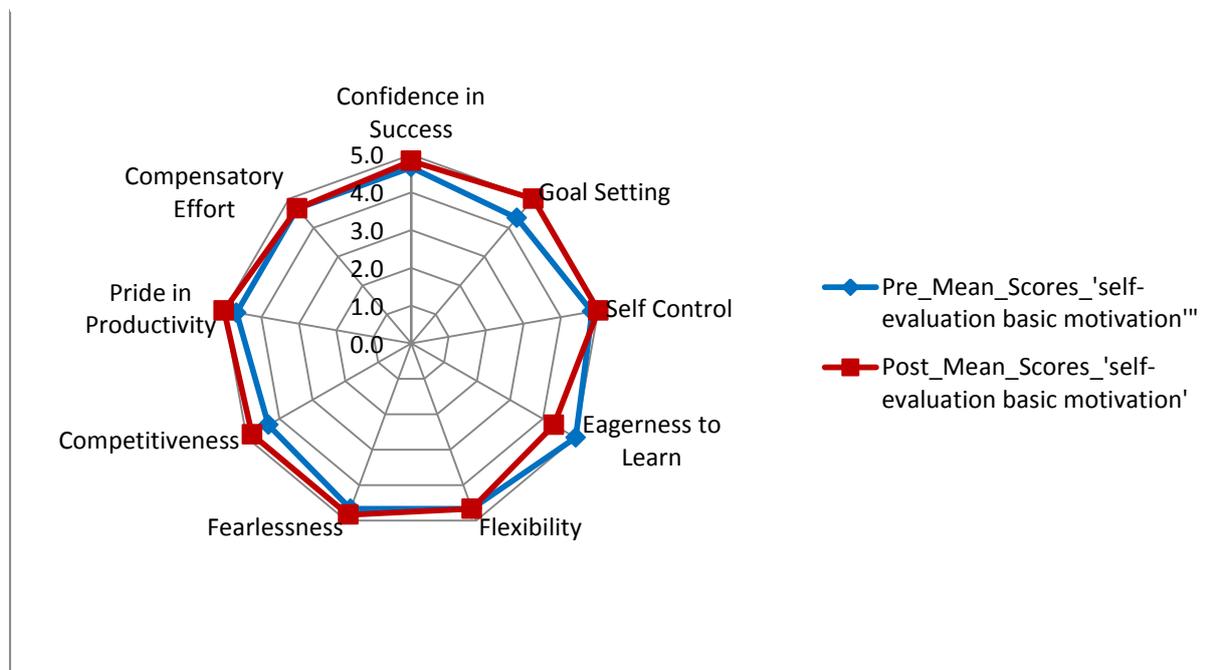
In the external assessment the three facets *Flexibility*, *Fearlessness*, and *Competitiveness* showed potential for improvement in motivation degrees despite the total mean score was already high. Yet, the scores of *Pride in Productivity* decreased in the post-survey. Insofar, the external assessment corresponds to the self-evaluation. Similar to *basic group 2*, this facet seems to be the one with the lowest motivation intensity and the lowest motivation degree, respectively. The external assessment coincides with the self-evaluation also with respect to increased scores of *Flexibility* and *Fearlessness*. Hence, the admittedly little positive changes in motivation degrees of the external assessment and motivation intensity of the self-evaluation tend in the same direction.

6.3.2.3 *Basic group 3* (Badi PTD-farmers)

As in the previous groups *basic group 3* shows increased motivation intensity. In total the score increased by +1.3 points from \emptyset +41.8 total points to \emptyset +43.2 total points. Although the judgment of all facets of being a driving force for motivation is very high in both pre- and post-survey *basic group 3* records relatively lower pre-scores in *Goal Setting* as well as in the facet *Competitiveness*. In the post-survey the PTD-farmers of *Badi* village judge the motivation intensity of *Goal Setting*, *Competitiveness* and *Pride in Productivity* higher.

Whereas the evaluation of the facet *Eagerness to Learn* turns out to be lower in the post-survey. Finally, all facets show almost the highest possible post-scores, except the facet *Eagerness to Learn*.

Figure 66: Facet scores part III ('self-evaluation basic motivation') of *basic group 3 (Badi PTD-farmers)*



Source: ZAHUMENSKY 2013

In the external assessment the motivation degrees per facet are throughout not as close to the optimal scores. In the pre-survey, only the facets *Compensatory Effort*, *Confidence in Success* and *Eagerness to Learn* record no or almost no potential for improvement. The both evaluations (external assessment and self-evaluation) correspond with regard to positive changes in the facets *Goal Setting* and *Competitiveness*. Yet, in practice the facet *Pride in Productivity* seems to be one of the facets with lower motivation degrees despite the farmers themselves judge the motivation intensity of the facet as higher after they have experienced participatory workshops. At least the trend of increased motivation degree/ increased motivation intensity for *Pride in Productivity* corresponds in the external assessment and in the self-evaluation. Meanwhile the facet *Flexibility* is judged as constant in its motivating power from farmers' perspective. Nevertheless, the external assessment reveals considerable decreasing motivation degrees for the facet *Flexibility* in the post-survey where the scores diminished by -2.2 points from \emptyset -1 point to \emptyset -3.2 points.

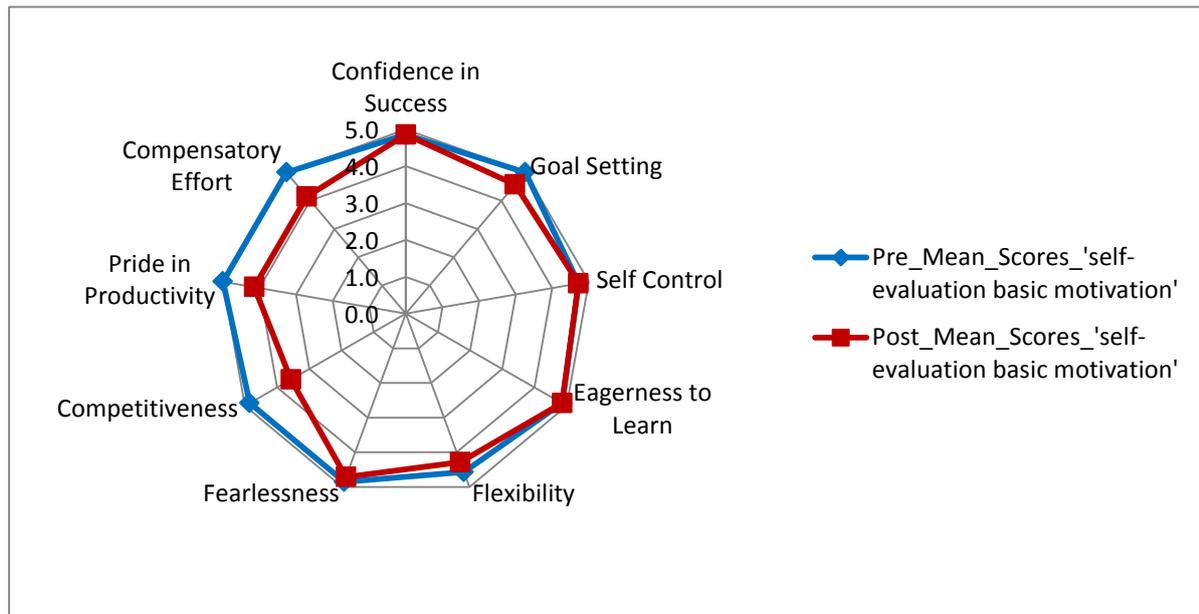
In sum, the tendencies of positive changes correspond in both evaluation forms, except the facet *Flexibility*. From this follows that *Flexibility's* power of being a driving force for motivation is judged as constantly high in *basic group 3* but in practice it turns out to be a

deficient motivation facet that even worsened in the motivation degree after the participants have experienced participatory tools.

6.3.2.4 Basic group 4 (Nimrani PTD-farmers)

The self-evaluation about the motivation intensity of *basic group 4* shows differing scoring patterns compared to the preceding *basic groups*. In the pre-survey the facets' motivating power throughout appears to be almost at the maximum score of 5 points. The group thus judges the motivation intensity very high for any basic motivation facet. In contrast, the post-survey records considerably decreased motivation intensities for *Compensatory Effort*, *Pride in Productivity* and *Competitiveness* with the result of a total decrease of all facets by 3.9 points from $\emptyset +43.7$ total points to $\emptyset +39.9$ total points.

Figure 67: Facet scores part III ('self-evaluation basic motivation') of *basic group 4* (Nimrani PTD-farmers)



Source: ZAHUMENSKY 2013

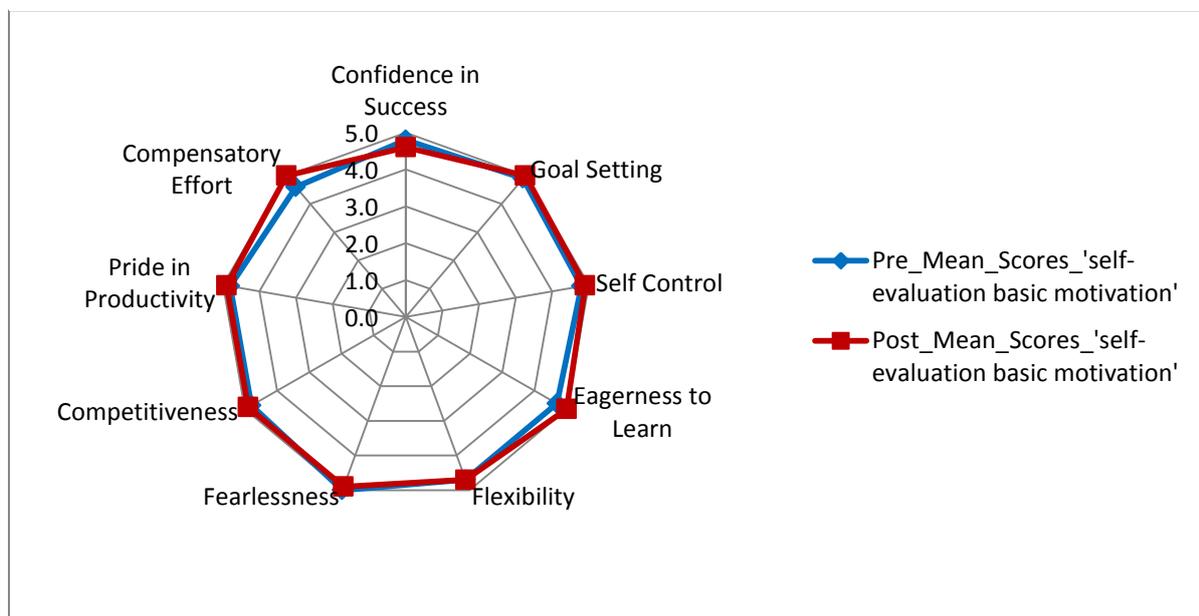
The external evaluation of basic motivation degrees does not show such decreased motivation degrees for the above facets but rather slightly decreased motivation degrees for *Goal Setting* and *Self Control*. For the facet *Flexibility* the external assessment records a considerable improvement of +2 points. Such an increase of the facet *Flexibility* is also not observable in the self-evaluation. Hence, the external assessment of motivation degrees does rather not correspond to the self-evaluation of motivation intensities since there the farmers of *basic group 4* judge the potential for being a driving force of motivation of the facets *Compensatory Effort*, *Pride in Productivity* and *Competitiveness* lower after the

participants have experienced participatory tools. In contrast, the external assessment shows constant high motivation degrees for those facets.

6.3.2.5 Basic group 5 (Choli non-PTD-farmers)

For *basic group 5* there are almost no changes to report in the self-evaluation. The motivation intensity of all basic motivation facets is judged very high in both pre- and post-survey (\bar{x} +43.1 total points vs. \bar{x} 43.9 total points). There are only very slight increases of the facets *Compensatory Effort* and *Eagerness to Learn* which in the post-survey align with the optimal scores of the remaining facets.

Figure 68: Facet scores part III ('self-evaluation basic motivation ') of *basic group 5* (Choli non-PTD-farmers)



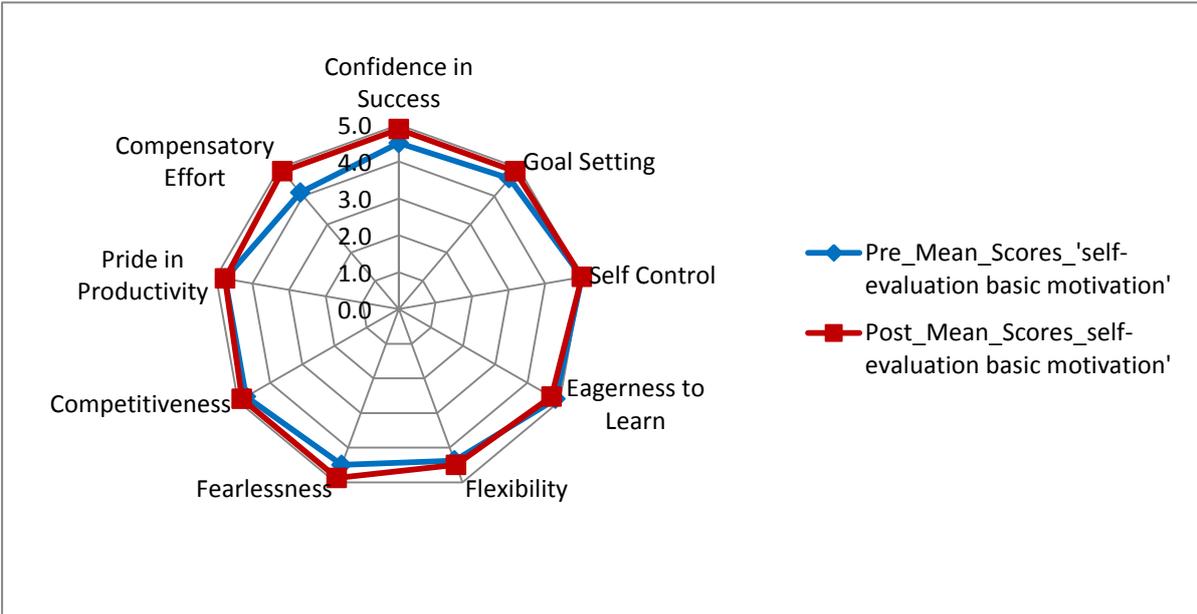
Source: ZAHUMENSKY 2013

The picture of the external assessment is similar except for the facet *Flexibility* which records an increase by 2.1 points in the post-survey. The remaining facets of basic motivation show no remarkable changes in the pre- and post-survey. Insofar, the external assessment corresponds to the self-evaluation in the case of *basic group 5*.

6.3.2.6 Basic group 6 (Nimrani non-PTD-farmers)

The second *basic group* of the control group discloses an increase in the total motivation intensity of all basic motivation facets by 1.9 points from \bar{x} +41.5 total points to \bar{x} +43.4 total points. This increase results mainly from a more positive judgment of the motivating power of the facets *Compensatory Effort*, *Confidence in Success* and *Fearlessness*.

Figure 69: Facet scores part III ('self-evaluation basic motivation') of *basic group 6* (Nimrani non-PTD-farmers)



Source: ZAHUMENSKY 2013

At recalling the results of the qualitative evaluation the increase of the above mentioned facets fits to the picture one has got from the non-PTD-farmers group of *Nimrani* village. There, the number of illiterate farmers with a reserved behavior was very high. Hence, positive changes of the motivating power of the facets *Fearlessness* and *Confidence in Success* after the participants have experienced participatory tools appear plausible and welcome. While the facet *Compensatory Effort* was judged relatively lower in the pre-survey it shows the highest increase in the estimated motivation intensity in the post-survey of the self-evaluation. This movement corresponds to the notion of rather shy and insecure members of *basic group 6*.

In contrast to the increase of total motivation intensity in the self-evaluation the external assessment of basic motivation in *basic group 6* displays a decrease of the total motivation degree by 1 point from \emptyset +40.4 total points to \emptyset +39.4 total points. In this evaluation form the facets *Goal Setting* and *Eagerness to Learn* record an increase but this positive change is offset by a considerable decrease of the facet *Flexibility* and a diminished motivation degree of *Pride in Productivity*. Insofar, the external assessment does not correspond to the self-evaluation neither for the changes in the total motivation degree/ in the total motivation intensity nor in the change of single facets. Only the slightly increased motivating power of the facet *Goal Setting* corresponds to the increased motivation degree of this facet in *basic group 6*.

Summary chapter 6.3

If one adds up all mean scores of the external assessment there appears a clear result that is illustrated in table 21. In total - summarized for all groups and for both questionnaire parts I and II - the motivation degrees have increased by 10.2 points. Round 86 % of this improvement originates from an increase in basic motivation while the rest arises from higher scores in motivation for participation. From this it can be derived that the participatory workshops that have been realized during the case study evidently had more (positive) effects on 'basic motivation' of the participants than on 'motivation for participation in participatory research' such as the FiBL/ bioRe-PTD-project. This results from tendentially less distinct increases of motivation degrees in motivation for participation but likewise it is attributable to negative changes of motivation degrees of *basic group 3* and *basic group 4* that offset positive changes in motivation degrees. Besides, improvements of degrees in motivation for participation are obviously to be reported for the most advanced and most PTD-experienced PTD-farmers groups such as *basic group 1* and *basic group 2*.

In general, the relatively high scores of the *basic groups* that were assumed to record lower motivation degrees (*basic groups 4 to 6*) than the more advanced *basic groups* (*basic groups 1 to 3*) are interpreted as 'hidden low scores'. Indications for this interpretative approach are patterns of decreased post-scores as well as an increased acquiescence tendency amongst farmers of these groups.

Table 21: Comparison of differences in total scores of the pre- and post-survey per *basic group* and per questionnaire part (rounded scores)

<i>Basic group</i>	Difference pre- and post-survey part I + II	Difference pre- and post-survey part I	Difference pre- and post-survey part II
<i>Basic group 1: Amlatha</i> PTD-farmers	+2.60	+0.60	+2.00
<i>Basic group 2: Choli</i> PTD-farmers	+5.31	+3.08	+2.23
<i>Basic group 3: Badi</i> PTD-farmers	+2.83	+4.00	-1.17
<i>Basic group 4: Nimrani</i> PTD-farmers	-1.86	-0.14	-1.71
<i>Basic group 5: Choli</i> non-PTD-farmers	+2.20	+2.20	0.00
<i>Basic group 6: Nimrani</i> non-PTD-farmers	-0.88	-1.00	+0.13
Σ of scores	+10.2	+8.74	+1.48

Source: ZAHUMENSKY 2013

Summarized, with respect to motivation for participation the presence of experience with the FiBL/ bioRe-PTD-project seems to be a substantial factor with regard to an improved motivation degree since obviously only the PTD-experienced farmers present

increased motivation degrees in motivation for participation in participatory research. Probably only the proof of benefits of participatory research can contribute significantly to an increased motivation for pro-active engagement.

At cross-checking the results of the self-evaluation about motivation intensities of basic motivation facets with motivation degrees of questionnaire part I ('basic motivation') the latter can only partially be validated by the self-evaluation. The main tendencies of changes correspond for most of the basic motivation facets in the case of *basic group 2* and *basic group 4*. The self-evaluation corresponds also in the case of *basic group 5* where no remarkable changes are to be observed neither in the external assessment nor in the self-evaluation. For the remaining *basic groups* the main tendencies of change in the self-evaluation do almost not or not at all correspond to the main tendencies of changes in the external assessment. The discrepancies in single facet scores are assumed to arise from the differing subjects they assess (motivation intensity vs. motivation degree), their different measuring scale and their difficult comparability. Hence, the self-evaluation retrospectively did not serve for a grounded validation of the results of the external assessment and, thus, it will not be addressed in more detail.

In the following the most notable results of the external assessment (quantitative measurement of motivation degrees) will be summarized for each *basic group*.

Basic group 1

The increase in total scores of *basic group 1* results from an almost exclusive improvement of scores in questionnaire part II ('motivation for participation in participatory research'). The approach that this increase indicates an advanced improvement of motivation for participation in the PTD-project has already been illustrated before.

Retrospectively, the results of the external assessment of basic motivation degrees of *basic group 1* disclose that the very slight increase in questionnaire part I results from a positive stimulation of the motivation degrees of the facets *Goal Setting* and *Fearlessness* whose improved scores are offset by a decrease in the motivation degrees of the facets *Flexibility* and *Pride in Productivity*. Hence, the changes in basic motivation degrees are little in *basic group 1* although the desired relative low-score facets *Goal Setting* and *Fearlessness* can be considered as having been successfully stimulated through the participatory workshops.

The improved motivation degree in motivation for participation of *basic group 1* is attributable to increased scores in the facets *Experimentation* and *Identification with new role as Researcher*. This is indeed a significant improvement of motivation facets that are highly relevant and desirable for self-reliant participation in the FiBL/ bioRe-PTD-project. Hence, in this respect the participatory workshops can be considered as having exactly met the objective that was intended to be achieved.

Basic group 2

The PTD-farmers of *Choli* village record the highest increase in motivation degrees, and, in fact, the increase arises from improvements in both motivation forms in about equal shares. The results from the external assessment reveal that all of the relative low-scores of the pre-survey in basic motivation for *basic group 2* (*Flexibility, Fearlessness, and Competitiveness*) could be positively stimulated during the participatory workshops.

This extends to the increased motivation degrees in motivation for participation. There, the desired facets *Valorization of Indigenous Knowledge, Experimentation* and *Identification with new role as Researcher* could be stimulated. Thus, the workshops can be characterized as having exactly met the objectives of stimulating facets that are highly relevant for the self-reliant participation in the FiBL/ bioRe-PTD-project. *Basic group 2*, hence, could improve motivation degrees of advanced facets, too.

Basic group 3

Basic group 3 already initiates the beginning of a decreased hierarchy of motivation degrees from *basic group 1* to 6. Admittedly, this group's degree of basic motivation improved considerably after the participants have experienced participatory tools. This is most probably due to the highest potential for improvement in many basic motivation facets that this group presented before the case study: *basic group 3* showed the lowest low-score basic motivation facets of all surveyed groups.

In the first instance, the relative low-score facets *Fearlessness* and *Competitiveness* could be positively stimulated during the workshops. Nevertheless, the stimulation cannot be designated as having stimulated low-score basic motivation facets in the targeted way as it was desired. Two of the low-score facets (*Flexibility* and *Pride in Productivity*) even decreased in motivation degrees after the participants have experienced participatory tools. In exchange, other facets (*Goal Setting* and *Self Control*) improved. The thing is not that such improvements are not desirable but they were not expected since they were not especially addressed to be stimulated during the workshops.

With respect to motivation for participation *basic group 3* records high motivation degrees but after the group members have experienced participatory tools the degrees of motivation for participation decreased. Relative low-score facets such as *Valorization of Indigenous Knowledge, Experimentation, and Decision Making* remained unaltered or increased or at least slightly increased. But these improvements went to the costs of other general participation facets such as *Ownership, Capacity Building*, as well as to the costs of the facet *Identification with new role as Researcher* that is highly relevant for the participation in the FiBL/ bioRe-PTD-project. This results in a decreased total degree of motivation for participation.

In sum, the participatory workshops can only partially be considered as having been successful, especially for basic motivation. Moreover, the workshops did not have targeted

intended effects. It can be assumed that the group's interest in experimentation in general could be even increased since the motivation degree of the facet *Experimentation* increased. At the same time other PTD-relevant facets that represent the interest in taking over responsibility for the project (*Ownership*), in spending extra effort for the observation of trials (*Capacity Building*), in internalizing the demand to be an equal researcher (*Identification with new role as Researcher*), and in acknowledging the importance of traditional knowledge for the experimentation (*Valorization of Indigenous Knowledge*) recorded rather decreased scores and thus lower motivation degrees.

Basic group 4

The basic motivation degree of the PTD-farmers of *Nimrani* village is remarkably high in comparison to the basic motivation degrees of other *basic groups* that were assumed to be more motivated. There was only one low-score facet in the pre-survey (*Flexibility*) that increased in the total scores in the post-survey. This improvement is offset by decreases in the facets *Goal Setting* and *Self Control* with the result of a constant high basic motivation degree in *basic group 4* for pre- and post-survey.

With respect to motivation for participation *basic group 4* also records high scores but an increased motivation degree after having experienced participatory tools. The motivation scores of the low-score facet *Valorization of Indigenous Knowledge* (VIK) indeed increased and this is a desirable improvement of a facet that is highly relevant for the participation in the FiBL/ bioRe-PTD-project. Insofar, the participatory workshops achieved the intended goal of stimulating the low-score facet. However, considerable decreases of the even more relevant facet *Experimentation*, as well as lower motivation degrees in the more general participation facets *Capacity Building* and *Ownership* offset the improvement in VIK.

Hence, *basic group 4* records an improvement of the motivation degree in one very important facet (*Valorization of Indigenous Knowledge*) that was particularly stimulated during the workshops. Nevertheless, another very important facet for the FiBL/ bioRe-PTD-project (*Experimentation*) records a decrease in motivation degree. Additionally, the motivation degree of the one facet that measures the willingness to spend extra time for the improvement of the own skills for independent experimentation as well as for information gathering (*Capacity Building*) also decreased in *basic group 4*.

Basic group 5:

In contrast to *basic group 4* the first *basic group* of the control group of non-PTD-farmers (*basic group 5*) records a high basic motivation degree after the group has experienced participatory tools. Low-score facets were the facets *Flexibility* and *Eagerness to Learn*. The first could be stimulated successfully during the workshops and increased considerably by 2.1 points in the post-survey. The stimulation of the second low-score facet in basic motivation was not that intense. This can be attributed to the few potential for

improvement that the facet *Eagerness to Learn* showed in the pre-survey. For basic motivation, however, the participatory workshop can be characterized as having been successful since the total basic motivation degree in sum increased.

The external assessment of motivation for participation is little illuminating since it shows almost no change in mean motivation degrees of pre- and post-survey. There is no distinct low-score facet to be identified. Yet, the analysis of distribution patterns of the scoring in the second questionnaire part indicates that despite unaltered mean motivation degrees in pre- and post-survey there are tendencies of a scoring towards lower scores in motivation for participation of *basic group 5*. A look at the data matrix reveals that general participation facets such as *Capacity Building* and *Decision Making* improved very slightly whereas the facet *Ownership* remained rather constant. The other three facets that are highly relevant for the FiBL/ bioRe-PTD-project rather show tendencies towards the lower scores after the participants have experienced participatory tools. Thus, the workshops cannot be considered as having stimulated PTD-relevant participation facets, albeit, this was also not explicitly intended in *basic group 5*. Since *basic group 5* involves only non-PTD-farmers the tendency towards improved scores of basic participation facets such as *Capacity Building* and *Decision Making* can be designated as successful impulse for a higher motivation in general participation.

Basic group 6

The second *basic group* of the control group (*basic group 6*) presents also high degrees of basic motivation but the mean score decreases after the participatory workshops have been implemented. Three relative low-score basic motivation facets were identified in the pre-survey: *Flexibility*, *Goal Setting* and *Eagerness to Learn*. The latter two facets could be successfully stimulated during the workshops. Nevertheless, their increased motivation degrees are offset by a considerable decrease of the motivation degree in *Flexibility* (-3.4 points), as well as by a decrease in *Pride in Productivity*.

In motivation for participation of *basic group 6* there are also observable changes in the motivation degrees of single facets but they offset each other with the result of an almost unaltered motivation degree in motivation for participation. The low-score facets *Experimentation* (EX), *Valorization of Indigenous Knowledge* (VIK), and *Identification with new role as Researcher* (IR) either increased (EX: +1.5 points) or show almost no change in motivation degrees (VIK, IR) after the participants have experienced participatory tools. Though, the improved motivation degrees are offset by decreased motivation degrees of general participation facets such as *Decision Making*, *Capacity Building*, and especially by a decreased motivation degree in the facet *Ownership*. Therefore it can be summarized that in *basic group 6* general participation facets could not be stimulated but even worsened after the workshops. One very important facet for the participation in the FiBL/ bioRe-PTD-project, however, could be successfully stimulated (the facet *Experimentation*).

At recapitulating the results of the qualitative and quantitative evaluation (external assessment) of participatory tools there has to be recalled the relation between the both evaluation forms. The qualitative evaluation of participatory tools served for the answering of the research question that the RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL) posed: *How can bioRe organic farmers be motivated to participate in the FiBL/ bioRe-PTD-project about the improvement of organic farming techniques? (Which methods are most suitable?)* And: *How can bioRe farmers' ideas be integrated more systematically into the FiBL/ bioRe-PTD-project and into the Long-Term Experiment?* (The latter question will be addressed in chapter 8: recommendations).

During the qualitative evaluation of participatory tools it was presumed that participatory tools generally are appropriate tools for the motivation of bioRe farmers. In the quantitative evaluation it was surveyed whether the motivation degrees of bioRe farmers in fact changed after they have experienced participatory tools during the workshop phase of the case study. Hence the quantitative measurement of motivation degrees served for the answering of the third research question that was posed by the author of this work: *Do participatory tools evidently have effects on motivation degrees of participants? And if so, which effects are measurable?*

This third research question leads to a much more fundamental questioning of the impacts of participatory tools and their measurability. Only the investigation of this fundamental question that will be additionally discussed against the backdrop of *post-development* critiques of participation leads to scientifically grounded and useful recommendations about the more systematical integration of bioRe farmers into the FiBL/ bioRe-PTD-project and into the FiBL *Long-Term Farming Systems Comparison Experiment* in India.

7. Discussion of results

In this chapter debatable results and observations in need of further explanation of the both evaluation forms (participatory evaluation via *points evaluations* during the workshop phase as well as evaluation of motivation degrees via standardized questionnaire) are discussed in the sequence as the respective results have been treated in chapter 6 (capacity building with *test workshops*; participatory evaluation of PTD-tools during the workshops in the field; motivation measurement of participants before and after the workshops).

7.1 Discussing the capacity building

Capacity building referred to the training of the local participation expert as well as to the sensitization for participatory philosophy of bioRe agricultural extension workers (in the following also referred to as 'extensionists'). Two important observations regarding the capacity building are addressed in the following.

With respect to the *test workshops* it was stated that the author and the co-facilitator agreed on a specific translation mode according to the motto 'as much translation/ information as possible and as less as necessary'. This principle is very vague and the informative content is in the translator's discretion. As a matter of fact, the information of the main facilitator (the author) took place in a selected way due to a selective translation by the co-facilitator. Judging the magnitude of selection and its effects is impossible as the main facilitator did not have sufficient command of Hindi language which was the exclusive workshop language. Moreover, translations often took place detached from the subject of discussion/ context for the main facilitator. Therefore, the interpretative character of the results of the participatory evaluation must not be underestimated even though the results or observations have always been reassured by checking them back with the translating co-facilitator.

Another insight that refers to the *test workshops* is that the extensionists' recommended not conducting a *Flow Diagram* with farmers in order to avoid an overcharge. It is assumed that this attitude indicates an underestimation of farmers' capacities from extensionists' side. From practice, it can be reported that a lot of advanced PTD-farmers methodologically felt unchallenged and bored during the application of simple PTD-tools such as rankings or simple diagrams. Thus, the application of more demanding tools in the group of investigation probably would have had a beneficial effect on the participatory evaluation or even on the measurement of motivation degrees. Besides, the possible underestimation of farmers can be taken as evidence for their poor recognition as agricultural experts who also possess broad knowledge, comprehension of complex structures, and abstract imaginative power.

7.2 Discussing the participatory evaluation of applied PTD-tools (qualitative evaluation)

Besides for content-related outcomes and the introduction of participatory practice the PTD-workshops served for the participatory evaluation of applied participatory tools by the target groups (qualitative evaluation). Hence, in the following critical aspects of the participatory evaluation will be highlighted in the sequence as they have been addressed in chapter 6. In some aspects they even lead to fundamental questions with respect to the case study design and evaluation approach.

7.2.1 Workshops 1 (WS 1)

In *workshop group 1* and *2* (*Amlatha* and *Choli* PTD-farmers) a balanced participatory evaluation of all tools during *workshop 1* was reported. Since the applied tools in WS 1 have been the first participatory instruments the farmers made contact with to this date the farmers did not have a point of reference for the evaluation. The lack of a reference base and the fact that the farmers actually had no significant preference is orally confirmed by some participants of *workshop group 1* and *2* so that the absence of a basis for comparison is an obvious explanation for the balanced evaluation. This presumption extends to the balanced *points evaluations* in WS 1 of *workshop group 3* and *4*. Another explanation for the balanced evaluations of tools arises from the problem of heterogeneous group members. In the *workshop groups* farmers from different villages and with different practical PTD-experiences and/ or differing motivation degrees were grouped. The quantitative evaluation gave evidence to heterogeneous or very heterogeneous distributions of pre- and post-scores, for questionnaire part I and II, and within and between all *basic groups*, except for *basic group 4* that generally shows very homogeneous scoring patterns. Under such heterogeneous conditions a balanced participatory *points evaluation* can also be suspected to have been leveled by opposing scorings of individuals.

It is finally not verifiable whether the first or the second explanation for balanced scorings is more relevant. Most probable both can be considered as having had influences on the actually much less balanced *points evaluations* of both *workshop groups* after the *final workshops* (summarized evaluation). At least the observable tendencies of more homogeneous scoring patterns in almost all *basic groups* in the quantitative measurement of motivation degrees (cf. figures 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56) reinforce not to rule out the correlation between homogenized groups and more distinct scorings during the *points evaluations*. To the contrary: the observation that the most *basic groups* tend to a homogenized scoring behavior in the course of the participatory workshops of the case study contribute to the unambiguousness of the scoring results of the participatory evaluation, and hence, they serve for their validation.

Another observation with regard to *workshop 1* was that one small group of the group work of *workshop group 5* and *6* was provided the opportunity to treat the topic 'seed production' at their own request. This topic turned out to be very difficult to visualize. In this case another predefined topic should have been preferred by the workshop facilitators in order to avoid frustration and a decreased motivation for participation due to an overcharging task. Besides this fact it may be that offering too much freedom of choice runs the risk of overcharging the participants of this and other groups.

Since *participatory technology development* as it is understood in this work optimally aims on the highest degree of freedom of choice and self-reliance in many aspects (from choosing the subject of experimentation to jointly developing the research design over documenting the results, etc.) the possible overcharge through the demand for a high degree of self-responsibility can pose a serious obstacle for pro-active and autonomous participation in the FiBL/ bioRe PTD-project in India where the PTD-participating farmers are ought to hold the ownership of the on-farm experiment segment. However, since the participatory moment of the PTD-project at the time of the case study can be designated as being still at the beginning the possible procedural overcharge is assumed to result from the novelty of participatory working. Hence, an initial overcharge can be assumed to reduce over time because the participants are expected to get familiar with the self-dependent experiment procedure.

Notwithstanding, it is debatable whether such overcharge relates to single PTD-tools with general high aspiration levels or whether the overcharge represents a fundamental problem of participatory philosophy. The qualitative evaluation suggests that an overcharge results less from the sometimes complex procedures of participatory tools since during the workshop phase the farmers rather felt unchallenged. Thus, it is more probably that the great objectives of empowerment and ownership or the initiation of social change may overcharge local farmers.

7.2.2 Workshops 2

It was mentioned in chapter 6 that very soon the working steps of the *Impact Diagram* became clear for the participants of *workshop group 1* and *2* (*Amlatha* and *Choli* PTD-farmers) with the result that participants felt unchallenged and bored. The repeated topics that were addressed during the tool's application as well as the summarizing character can be considered as causes for the negative judgment. Moreover, the dislike can also have occurred due to an unfavorable placement of the *Impact Diagram* during the workshop sequence or the selection of a generally unsuitable tool in this group. According to this, one cannot exclude that a suboptimal workshop design has had influences on the farmers' scoring.

This aspect points out a very fundamental dilemma of the evaluation of participatory tools during the case study: the question of practically vs. scientifically

comparing different things. In every workshop and in every *workshop group* there were applied varying tools in varying sequences so that none of the workshops was alike the other. Therefore, in the strict scientific sense, the tools' comparison is difficult due to the difficult traceability of a variety of factors that influenced the evaluation. As a matter of fact, the combination of evaluating participatory tools according to their attraction potential for farmers, *and at the same time* according to their potential to increase individual's motivation degrees *even in* heterogeneous target groups proved to be a serious challenge for the research design as well as for the interpretation of partially very diverse findings, respectively. However, in a holistic view of the research approach of the case study (comparing farmers groups that were imagined as hierarchically structured) and with regard to the small sample size the heterogeneity of the farmers groups was scientifically necessary in order to retrace variations in the participatory evaluation of PTD-tools (qualitative evaluation), and in motivation degrees per *basic group* (quantitative evaluation). Hence, by the fact of having heterogeneous groups of investigation it was also unavoidable to designing the workshop programs individually according to the level of advance/ experience with the PTD-experimentation of farmers groups and according to the assumed appropriate or preferred topics in the respective group in order to avoid mental under- or overload.

By the end, the evaluation dilemma cannot be eliminated. The only way is to make it transparent in order to ensure an interpretation of the findings of the case study that takes into account the various debatable aspects of the results. Finally, the case study was explicitly designed as exploratory survey. Accordingly, disclosing obstacles, scientific problems, and working out recommendations for further investigations about the research topic and/ or research design had to be expected.

Another observation during *workshops 2* that is worth mentioning refers to the topic of interest in the workshop group that included only the control group of non-PTD-farmers (*workshop group 5 and 6*). As will be explained in the following this topic of interest is very insightful for the comprehension of the solution finding attitude among less motivated PTD-farmers or less motivated bioRe farmers who do not participate in the FiBL/ bioRe-PTD-project. In chapter 6 it was stated that the facilitators among others selected the *Transect Walk* to be conducted during WS 2 in *workshop group 5 and 6* due to the demand of the participants who during *workshop 1* voiced an interest in covering the topic 'cotton varieties'¹⁶². It is assumable that the interest in cotton varieties can be traced back to the main interest in improving crop performance by finding the most promising variety instead of looking for treatments that could improve the performance of even low yielding varieties. From scientific perspective and in consideration of the local environmental conditions the latter is assumed to be a more feasible way of improving crop performance since for

¹⁶² Since at the time of the case study there was located an informal cotton variety trial at the bioRe farm the facilitators offered to the participants to make a walk across the trial and to compare the performance of the planted cotton varieties.

instance compost treatments as they are part of the FiBL/ bioRe-PTD-project generally take into account low input conditions of the region. In contrast, the purchase of high yielding crops is supposed to be more costly and less sustainable because such varieties might not be locally adapted and might be tainted with disadvantages such as susceptibility to diseases and pests.

This approach of the non-PTD-farmers *workshop group* is representative for a very common attitude of local farmers with respect to solution finding strategies. It might be true that finding the optimal cotton variety is supposed to be a simple and rapid solution for local difficulties in cotton cultivation once the optimal variety is figured out. But, first of all, seed production is a very subtle and long-lasting process where results can delay and, secondly, experimenting with crop varieties demands very skilled breeders. Moreover, investments in the breeding of a locally optimized cotton variety may accumulate with the time. In this regard, treating crop varieties is only apparently a rapid and simple solution. The process of treatment optimization that appears more feasible, cheaper, and more sustainable but probably demanding more ongoing efforts from the farmers is commonly disregarded. During the workshops it could be observed that conveying a notion of sustainable organic practices and the necessity of spending extra effort for e.g. improvement of crop treatments among non-PTD-farmers was difficult. In general, during the stay at bioRe the author had the impression that it was not unusual among bioRe farmers that their motivation for organic farming did not arise from conviction but rather from the evidence about failure of conventional farming. There is a subtle but significant difference since the 'farming philosophy' of conventional farming still seems to persist (i.e. finding rapid and simple solutions for best results). Accordingly, a certain susceptibility of farmers for the lobbyism of seed companies such as MONSANTO COMPANY who offer genetically modified seeds and promise rapid solution finding at lowest input conditions still cannot be denied even among bioRe organic farmers.

Against this backdrop a sensitization for the usefulness of participatory research, for time consuming research methods such as PTD, for the necessity of spending extra effort and of being flexible for experimentation with agricultural techniques was challenging in the non-PTD-farmers group. Furthermore, the above aspects also explain the low motivation for participation in this group as well as the more distinct *acquiescence tendency* during the quantitative evaluation among non-PTD-farmers.

Another question refers to the fact that the *Transect Walk* in *workshop group* 5 and 6 was judged relatively poor in this group although the tool addressed the desired topic of interest of the participating farmers. One explanation may be the high interest in the topic but low interest in the active practical application of the tool that treated the topic. One indication for this assumption is that the participants refused drawing the transect diagram even upon motivating request. Thus, the low scoring may arise from a disappointment about the outcome of the tool: there was not offered a clear solution or a promising new cotton

variety by the end of the *Transect Walk* but rather the advantages and disadvantages of the different varieties were discussed. For the participants this might have been nothing new.

Another explanation is the blazing heat to which the farmers have been exposed to during the realization of the *Transect Walk*. This negative correlation between tool and temperature during its application might have led to a transmission of negative impression on the tool. In the forefront of the workshop phase this risk was considered by the facilitators, and in the workshop programs it was planned to avoid conducting a field method during midday heat. Yet, in practice, this turned out to be inevitable due to the repeated retarded beginning of the workshops. It happened frequently that already present participants and facilitators had to wait for a large number of missing participants who delayed. Sometimes the whole workshop group delayed for more than one hour. However, there cannot be recommended strategies to avoid this problem since the exact causes are vague (local culture, problems of huge distances, logistic problems, weather-dependency of agricultural activities) or difficult to influence.

7.2.3 Final workshops (FWS)

– General observations of workshop groups 1 to 4 (all PTD-farmers)

One aspect came up during the *final workshop* of all PTD farmers (PTD-exhibition). On the one hand this aspect refers directly to the FiBL/ bioRe-PTD-project, and on the other hand, it gives deeper insights into farmers' 'participation mentality' or driving force of motivation. By the end of the *final workshop* the farmers voiced the demand for larger on-farm baby-trials. The facilitators reacted with restraint since the question arose whether farmers are only interested in receiving more external 'gratis' inputs¹⁶³ in their fields. As a matter of fact the enlargement of on-farm baby-trials for experimental purposes is not necessary. Hence, the demand for the enlargement of experiment trials conveys the impression that even the PTD-farmers show a 'receiver mentality' of expecting benefits (knowledge from the experiment observations as well as material inputs) while avoiding to make major investments (taking over responsibility for the baby-trials and conducting the experiment self-dependently). The motivation for participation of farmers in the PTD-project thus seems to base on motives which do not correspond to the expected or desired motives of the FiBL/ bioRe research team (e.g. participating from strong conviction of the participatory philosophy, as well as for reasons of joint and self-dependent solution finding). However, in practice, it proved that the perception of the dimension of spending extra effort came upon the farmers unexpectedly. Many of them were surprised about the intense work load and time-intensity that participatory working involves. Especially the demand of every

¹⁶³ The notion of receiving treatment inputs and knowledge during the FiBL/ bioRe-project seems to be very common among PTD-farmers. However, since the participants have to invest time and extra effort (they have to manage the trials, to observe and report about treatment results) the inputs are only apparently gratis.

PTD-farmer for the necessary written recording of observations in the baby-trials encountered resistance since each farmer was individually asked to accomplish this task and each farmer's self-discipline at home was asked.

Besides, the observed resistance against this task of documenting is also accompanied with a positive evaluation of group dynamics. The participants seem to prefer tasks that have to be accomplished in the group instead of an individual task that is ought to be done at home in surroundings of a set daily routine. There it is more difficult to take one's time to accomplish the task. Hence, inviting farmers groups to the bioRe farm or leaving them on farmers' fields seems to beneficially influence the motivation to actively fulfill one's PTD-duties.

With regard to the demand for larger baby-trials further positive observations can be reported. During the discussion about the enlargement of baby-trials the facilitators also accentuated the experimental character of the on-farm research and the possible failure of a new experiment topic that might result even in a decrease of yields. Hence, a benefit during the PTD-project in general cannot be guaranteed. The farmers replied that they were prepared to take the risk in the hope to further improve organic farming practices. Most probably the farmers would not that willingly take the risk if they would not have the certainty of benefiting anyway from the PTD-experiment. Consequently, asking for increased treatment application is likewise indicative for the good results of the treatment experiment and for a high willingness for experimentation in order to improve farming techniques that appear promising for the increase of yields and the sustainability of crop cultivation.

– **Observations with regard to *points evaluations***

Another relevant observation refers to the participatory evaluation (*points evaluation*) of *workshop group 1 and 2 (Amlatha and Choli PTD-farmers)* after the *final workshop* (PTD-exhibition). At contrasting the different *points evaluations* over time (see figure 34) a decrease in total points had to be reported in this group (-46 in number). This significant loss of votes results from a fading of participants after the PTD-exhibition. It occurred from time to time that farmers delayed in coming back or even didn't come back at all after a break. Since these incidents were hardly been noticed they were difficult to control. Furthermore, the facilitators from the beginning decided to control the participants as less as possible in order to accentuate the voluntariness of the workshops. However, concurrent participant observations indicate that the reduced number of points did not distort the final evaluation's results in that case since the preference of *SWOT-Analysis* and *Field Visit* was already clearly voiced during the previous *workshops 1 and 2*.

In *workshop group 3 and 4 (Badi and Nimrani PTD-farmers)* there can also be observed relevant aspects regarding the *points evaluations* where the both *Matrix Rankings* experienced negative judgment. Certainly, one reason for that is that the ranking tool was applied twice with the result that the process of *Matrix Ranking* was judged as boring. The

disadvantage of leveling of group scores in the plenum during the second *Matrix Ranking of workshop 2* may be another reason for the negative judgment.

Furthermore, at comparing the total points of the *points evaluations* of the separate and summarized evaluation in this group (see figure 35) it was mentioned that a decrease in total points (-21 in number) has to be reported. That is probably due to the above mentioned reasons of absenting participants. On the base of informal group observations there is also cause for the assumption that this loss of scoring points did not lead to a distortion of the main tendencies of evaluation in this groups. Already during *workshop 1* the farmers admittedly appreciated the results of the ranking tool but they already criticized its time-consuming and unexciting procedure.

– **Observations with regard to methodological preferences**

Considering the deduction of general tendencies of methodological preferences further aspects after the *final workshops* can be reflected, f.i. that there is indeed coherence between popularity of a tool and whether it was conducted in the plenum or in small groups.

The participants of *Choli* and *Amlatha* village (*basic groups 1* and *2*) who were assumed to be the most active and most PTD-experienced farmers experienced only one tool in small groups (*Impact Diagram*) that was ranked the less popular tool in the separate and all the more in the summarized evaluation. With regard to the general high interest in exchange which this group constantly showed (particularly during the *final workshop* where all PTD-farmers of the case study met) it can be concluded that these two *basic groups* tend to prefer tools which are realized in the plenum in order to exchange opinions and findings as well as for group discussion purposes. Additionally, it could be observed that *basic groups 1* and *2* were also very keen on pushing on the project activities for their own benefit (f.i. enlarging the baby-trials, continue with experiments on varieties). For such decision-making orientation tools that are conducted in the plenum obviously are the more adequate tools since they base on consensus-building processes of the entire workshop group - and consensus building processes are fundamental for joint decision-making. Therefore, the plenary tools seem to be more appropriate for the more advanced *basic groups*.

In contrast, the participants of *Badi* and *Nimrani* village (*basic groups 3* and *4*) who were assumed to be more reserved, less active and less PTD-experienced than *basic groups 1* and *2* practiced two tools in small groups (*Expectations Matrix* and *Group Field Observation*). In a first instance, the separate scoring between the tools that were conducted in the plenum and those that were conducted in small groups did not record much variance. Yet, during the final summarized evaluation the preference of tools that took place in small groups became evident. There are two interpretation approaches for the preference of tools that are conducted in small groups.

Either the participants prefer the group work because after *workshop 2* the plenary tool (*Matrix Ranking*) was judged as repetitive and thus boring. The unpopular judgment of

the *Matrix Ranking* due to its repetition can be discerned from the even worse scoring at the second evaluation. In this case, the facilitators possibly have prejudiced the participants for plenary tools and hence could be responsible for a distorted base of evaluation since they answer for the tool's procedural repetition.

Or, in the other interpretation, the participants actually prefer the group work independently from the applied plenary tools whose repetitive character was judged negatively. There can be several indicators that the latter explanation for the positive evaluation of tools that are conducted in small groups outweighs the first explanation model. First of all, the participant observation suggests that the farmers of *basic groups 3* and *4* command the same excellent observation and analyzing skills than the farmers of *basic groups 1* and *2*. It was probably the PTD-inexperience of *basic groups 3* and *4* that made the participants behaving more reserved as well as seeking rather for detailed information and learning about the FiBL/ bioRe-PTD-project. Group work generally tends to going into the detail of a topic, gathering more information and working out a concrete plan, vision or status quo of a situation. In a second step results of a group work are often interposed in the plenum for evaluation and decision-making purposes. Bearing these circumstances in mind, it appears more likely that the participants of *basic groups 3* and *4* de facto preferred group work in this stage of comparably few PTD-experience since they first of all had to learn more about the PTD-project and to go into detail of associated issues. It is well probable that in a later project stage - as soon as the farmers of *basic groups 3* and *4* have increased PTD-experiences - they will prefer the more advanced analytical plenary tools as well. However, one cannot rule out the possible negative influence on the scoring due to an unfavorable repetition of tool procedures.

– **Observations with regard to diverging knowledge systems and response set**

In *basic group 5* (*Choli* non-PTD-farmers) especially the *Impact Diagram* was judged negatively. The farmers gave the feedback that this was due to a dislike of the treated topic ('conventional farming'). Obviously, the evaluation has been effected on an affective base. At this, the varying approaches of differing knowledge systems become apparent. While the scientific approach that is represented by the author of this work took an objective evaluation for granted during the field study the actual evaluation in the field at least in this case took place on the base of a local indigenous knowledge approach that is assumed to emphasize less on objective measurable or observable facts. It is valuable information that facilitators should take into account the fact that treated topics of participatory workshops generally can have much more influence on participatory evaluations than it is usually expected by facilitators. The importance of the careful selection of workshop topics thus shall not be underestimated.

However, although for scientific reasons it would have been recommendable the author decided not to repeat the evaluation on a more objective base in *basic group 5* for

four reasons. First of all, this kind of subjective evaluation is not being considered as 'wrong' or insufficient per se. To the contrary: if participants dislike the tool due to the treated topic this is accepted as a fact. Acknowledging the equal valorization of evaluation approaches that base on indigenous knowledge systems represents one of the imperatives of restraint during the realization of participatory methodology. Moreover, asking for a reevaluation potentially would have led to the transmission of a questionable message, i.e. of having misunderstood the task and having failed. Additionally, there is cause for the apprehension that the participants possibly could have executed a reevaluation under the aspect of delivering the result that was guessed to be expected by the facilitators or other group members (*social desirability bias*). This indeed would have led to a distorted result of the evaluation.

In *basic group 6* (*Nimrani* non-PTD-farmers) it was pointed out in chapter 6 that the facilitators observed that one participant gave all available evaluation points to the *Impact Diagram* while the other one gave four points to the *Impact Diagram* and two to each of the other tools. The scoring behavior in this case points at two quite different scoring types: one with a central tendency and one with a clear preference. The generalization of evaluation results in this group is therefore even more difficult. Yet again, informal participant observation turns out to be very helpful in this situation.

The behavior of the farmer who gave all available evaluation points to the *Impact Diagram* represents the strong identification of a participant with a tool related to the degree of active participation during its application. The background in this context is that the agricultural extensionists of *Nimrani* village informed already during the preliminary workshops that this farmer was illiterate. Correspondingly, despite his continuous presence at the workshops (and thus high general willingness for participation!) the degree of *pro-active* participation was low due to a presumed high insecurity of speaking, writing or drawing in front of other participants. Interestingly, at the *Impact Diagram* the farmer in question showed an exceptionally active behavior since he presented the results of his group with much appreciativeness by other workshop participants. Probably due to this positive association of acknowledgment by other participants the farmer subjectively judged the associated tool as his clear preference at the final evaluation. Another reason may be that on the one side he could best remember the process and results of this tool due to his active participation and on the other side because it was the last tool during the workshop phase that probably could be best recollected. In addition, the other farmer who participated in the final evaluation showed a slight preference of the *Impact Diagram* that possibly might be evoked by the high scoring of the other farmer (peer pressure and forming of opinion in groups, cf. ŞERIF & ŞERIF 1953¹⁶⁴).

¹⁶⁴ MUZAFFER ŞERIF was a Turkish social psychologist who surveyed the question whether individuals show themselves ready to defer to somebody's judgment although there are apparently no compelling reasons.

7.3 Discussing the evaluation of motivation degrees (quantitative evaluation)

The quantitative evaluation served for the measurement of motivation degrees of workshop participants of the case study. It was realized in form of a standardized motivation questionnaire that is conceptualized as a personality test. The motivation questionnaire was conducted twice and assessed the motivation degrees of participants before and after the participants experienced participatory tools. This pre- and post-survey allowed for the calculation of motivation degrees per *basic group*. On the base of these calculations changes in motivation degrees could be monitored and interferences from the workshops about the improvement of motivation degrees of participants could be drawn. In this chapter, the most important and debatable aspects of the quantitative evaluation will be addressed in more detail.

– Response set (*acquiescence tendency*) and 'hidden low scores'

At illustrating the results of the quantitative motivation measurement in chapter 6 several times it was referred to the peculiarity of the basic motivation facet *Flexibility* and related debatable findings. The assessment of this facet needs further explanation since it took place differently from all remaining facets: the item questions were designed as catch questions. This aimed at a spot test for cross-checking purposes with regard to the prevalent response set of the surveyed farmers as well as with regard to the interpretation of the generally high motivation degrees of farmers. In general and in the first instance, the catch question underlines the assumption of a distinct *acquiescence tendency* as prevailing response set among all surveyed farmers as well as the concomitant interpretation of high scores of the less motivated farmers as 'hidden low scores' as it will be elaborated in the following.

In question number 9 and number 10 of questionnaire part I ('basic motivation') that assess the facet *Flexibility* the respondent was ideally expected to answer question number 9 with "I strongly disagree" and consequently he was expected to ideally answer question number 10 with "I strongly agree" in order to receive the highest scores that indicate the highest motivation degree for the facet *Flexibility*. The optimal and consistent answering behavior is marked with green smileys in figure 70. The opposite suboptimal although also consistent answering behavior is marked with red smileys. Whatever answer the respondent gave the one with a more reflective and critical attitude at least was expected to answer in such a way that the answers did not interfere (one cannot dislike changes and at the same time easily accept changes).

According to ŞERİFS findings judgments in groups tend to converge during repeated judgments with the result of conformity of judgments.

Figure 70: Catch question of the basic motivation facet *Flexibility*

Question no.		I strongly agree	I agree	I agree somewhat	Undecided	I disagree somewhat	I disagree	I strongly disagree
9	I like to have a set routine at work and I do not like if I have to change my routine and do things differently.		<input type="radio"/>					
10	It is easy for me to accept changes in my life or at work. I like to look for new ways to do things and for innovative solutions to my problems.		<input type="radio"/>					

Source: ZAHUMENSKY 2013

In practice, it most often happened that the interviewees answered both questions with "I strongly agree" (*acquiescence*) or "I agree" with the result that high scores in question number 9 were offset by low scores in question number 10 (very seldom vice versa). From this follows, that the majority of the respondents did not recognize the dichotomy of the both questions.

On the one hand these response patterns led to a principally much lower score in the basic motivation facet *Flexibility* because in the average each respondent lost 3 points in this facet. This most probably would not have occurred if the item questions would not have been designed as catch question. In this respect the question arises whether the motivation degrees of other facets would also systematically have turned out much lower if their item questions would have been designed as catch questions. The previously mentioned sometimes considerable loss of participants during the workshop phase in combination with the strong *acquiescence tendency* underpins an actually estimated lower average motivation degree of all surveyed farmer groups in all questionnaire parts. The previous statements of the statistical analysis of motivation scores have to be seen from this angle. This also points on a distortion of the results of the quantitative evaluation. Albeit, the tendencies of changes remain unaffected by the motivation degrees throughout lower or higher. At this point the results of the standardized questionnaire as they are illustrated in chapter 6 are consistent.

However, the catch question does not only scrutinize the statistical results but it also gives valuable information about the tendencies of a general unreflecting response behavior of a majority of interviewees at least before the workshop phase. Likewise the motivation degrees (motivation scores) it can be reconstructed whether there were changes *in the response behavior* before and after the groups have experienced participatory tools. In chapter 3 it was elaborated thoroughly that it is natural to participatory tools to stimulating

critical consciousness and thus to leading to a *conscientization* of target groups. Provided that this applies it can be assumed that in the post-survey the answering patterns of the questions number 9 and 10 are expected to have changed towards more reflective and consistent answering patterns.

This presumption of *conscientization* allows for the derivation of the following assumed categorized response patterns for pre- and post-survey. For any group be it the theoretically most motivated or the less motivated there should be observable a tendency towards a more reflective answering behavior that automatically can be expected to result in more consistent response behavior of each respondent and for each *basic group*, respectively. The more consistent answering behavior should result in a decrease of the scores of the facet *Flexibility* in the very motivated groups since they are supposed to most likely recognize the demand for a consistent answer of question number 9 and 10. Most probably the score in *Flexibility* was already not the lowest in the pre-survey of the most motivated groups because from the beginning their members were supposed to be more flexible than the less motivated. Hence, the more motivated groups are supposed to show tendencies of low scores in the facet *Flexibility* already in the pre-survey but still higher pre-scores than the less motivated groups. In the post-surveys the most motivated groups are supposed to show not only tendencies of a more consistent response behavior but also tendencies towards a more optimized response behavior, i.e. a reversal of answers according to the green smileys which results in higher motivation scores. In case there is no improvement in scores but only a more consistent response behavior the scores of *Flexibility* in the more motivated groups are expected to worsen in the post-survey. This would be due to a still low score but a more consistent response pattern where formerly positive and negative answers would no longer offset each other with resulting scores around ± 0 points. Since the optimal desired case of improvement of *Flexibility* scores cannot even be expected from the group of the most advanced PTD-farmers of *Amlatha* village (*basic group 1*) the consequent worsening of *Flexibility* scores in the post-surveys can be expected for the most motivated groups. In sum, a *Flexibility* score around ± 0 in the pre-survey in combination with a decreased *Flexibility* score in the post-survey are assumed to point at a more motivated group. Probably, *Flexibility* is not expected to improve but at the same time the groups is expected to show a more consistent answering behavior that consequently is expected to result in lower *Flexibility* scores.

The empirical results give evidence to these scoring patterns of the more motivated groups since, in fact, *basic groups 1 to 3* record pre-scores of the facet *Flexibility* that lie between -0.6 and -2.4 average facet points. In the post-survey two of the three *basic groups* (*basic group 1* and *3*) show decreased motivation scores instead of desired higher motivation scores (*basic group 1*: -1.4 points; *basic group 3*: -2.2 points). The scores of the facet *Flexibility* in *basic group 2* increased and changed towards ± 0 average points. As a consequence, the above assumptions for the more advanced PTD-farmers groups can be

considered as being true at least for two of three groups. These observations lead to the conclusion that the most advanced PTD-farmers could rather not improve their scores in *Flexibility* but their answering behavior can be estimated as more consistent even though with the reverse result of decreased motivation scores. Therefore, at least the critical reflecting attitude can be considered as having been stimulated after the workshops in *basic group 1* and *3*. The increased post-scores of the facet *Flexibility* in *basic group 2* possibly result from a lower motivation to answer the questionnaire a second time after the *final workshop* which displays a more distinct *acquiescence tendency* as response set that resulted in scores around ± 0 average points in the post-survey.

For the less motivated groups (*basic groups 4 to 6*)¹⁶⁵ the above presumptions lead to the expectation of the same scoring patterns but probably less distinct. Since the less motivated groups are assumed to have answered less critical and less reflected they are expected to have answered in both questions predominantly with the category "I strongly agree". As a result the *Flexibility* scores of the pre-surveys of the less motivated groups are likewise the more motivated groups expected to lie around ± 0 points¹⁶⁶. However, in the post-survey the *Flexibility* scores are expected to having less explicitly declined.

Yet, there is no empirical evidence about these response patterns for two of three of the less motivated groups. The case study shows that *basic groups 4* and *5* do not record slightly decreased *Flexibility* scores in the post-survey. To the contrary they show a reverse response behavior since they seem to have answered much more consistent in the pre-survey than in the post-survey. Already in the *pre-survey* they have answered similar to for instance the as most motivated assumed PTD-farmers of *basic group 1* in the *post-survey*. The less negative *Flexibility* scores in the post-survey of the less motivated *basic groups 4* and *5* suggest a tendency towards a less reflected response behavior in the *post-survey*. An increase from minus scores to neutral scores in this case should not be interpreted as improvement in the sense of improved consciousness although the scores per se indicate improved motivation degrees. According to the above logic this would rather represent a less motivated and less reflective response behavior in the post-survey for *basic groups 4* and *5*. Yet again, this leads to the interpretation of high motivation scores rather as 'hidden low scores' than as actually increased motivation scores.

¹⁶⁵ The results of the quantitative evaluation question whether *basic group 5* can be allocated to the less motivated group since they partially disclosed scoring patterns that correspond rather to the more motivated *basic groups*.

¹⁶⁶ The occurrence of the pre-score around ± 0 can differ according to the farmers groups. It is unapparent whether the score resulted from an offset of +3 and -3 points or from an offset of +1 and -1 point. The latter indicates an already more reflected answering behavior where the farmers did not simply answer with the first of all available answering options. That implies that although more motivated and less motivated farmers groups can both obtain ± 0 points in the pre-survey of the facet *Flexibility* they might differ in the way they offset the scores. The more motivated groups are supposed to have offset the scores with more reflected answers that were attributed to the scores ± 2 or ± 1 while the less motivated are supposed to have answered with the less reflected answers that were attributed to the scores of ± 3 .

One aspect that underlines this interpretation - the assumed unlikeliness of a de facto increased motivation degree among less motivated farmers groups that bases on the informal observations of a rather decreased participation among these farmers - was already mentioned. The second aspect that has to be considered with respect to the reverse answering behavior of *basic groups* 4 and 5 is the possibility that these groups lost even their motivation to answer the questionnaire of the post-survey at least with the same stringency as they answered the questions in the pre-survey. Possibly, they respondents were no longer in the mood to answer at all and therefore they more often answered with the first of all available answer option ('I strongly agree') with the result of scores that offset each other.

The second aspect that should be mentioned is related to the interviewer. There is no doubt that throughout the survey phase the interviewer gradually got more familiar with the questionnaire and its question structure. By the end of the interview phase the interviewer had memorized almost all questions and new about the catch question. It is possible that he unconsciously influenced the answering mode especially of the catch question due to additional comments and explanations of the questions which the interviewee did not add at the beginning of the survey when he by himself was still not very familiar with the questions. Since the interviews were realized in Hindi language it cannot be excluded that the opposing questions number 9 and 10 have been non-verbally or verbally signaled by transitioning comments such as "Now for the opposing question". This might also be of relevance for the explanation of increased post-scores in the facet *Flexibility* of *basic group* 2 that was assumed to be one of the more advanced and more motivated groups. It is also possible that in the case the interviewee initially has unintentionally signaled the opposing questions in this group he stopped a possible suggestive behavior during the workshop phase. This can have resulted in less consistent response patterns of the facet *Flexibility* in *basic group* 2 with increased scores around ± 0 average points in the post-survey.

Summarized, for *basic group* 4 and 5 it may be that the combination of a suggestive interviewer in the pre-survey (that led to a quite reflective scoring behavior of the facet *Flexibility* in the pre-survey) and the possibility that by the end of the post-survey interviews some interviewees as well the interviewer himself lost interest in the survey (*basic groups* 4 to 6 belonged to the groups that have been surveyed at a later moment of the case study) led to an unreflecting response behavior in the post-survey that resulted in unexpected improved motivation scores in the post-survey. Using the example of the catch question of the basic motivation facet *Flexibility* it was deduced in all detail why this seemingly improved motivation degrees for *basic group* 4 and 5 can definitely and reasonably be interpreted as 'hidden low scores' of motivation.

– **Powers of influence of participatory tools**

The results of the quantitative measurement of changes in motivation degrees of *basic group 3* bring up the legitimate question about whether participatory workshops can actually influence the motivation degrees of individuals in a direct way. In the external assessment of basic motivation degrees *basic group 3* disclosed results where, in the first instance, the relative low-score facets *Fearlessness* and *Competitiveness* can be considered as having been positively stimulated during the workshops. Nevertheless, the stimulation cannot be designated as having stimulated low-score basic motivation facets in the targeted way as it was desired. Two of the initially low-score facets (*Flexibility* and *Pride in Productivity*) even decreased in motivation degrees after the participants have experienced participatory tools. In exchange, other unintended facets (*Goal Setting* and *Self Control*) improved. Such improvements were not expected since they were not especially addressed to be stimulated during the workshops.

Besides the assumptions that (participatory) motivation degrees are measurable, and that the motivation degrees are influenceable, the ability of participatory tools to directly influencing motivation degrees *in a targeted way* was one of the very general premises of the case study. The quantitative element of the case study gives evidence to the fact that there are indeed changes in motivation degrees immediately after the workshops. Yet, the case study cannot specifically give evidence to whether participatory tools principally can exert influence in a targeted way. The above results of *basic group 3* give reasons to doubt on the powers of influence of the applied PTD-tools. It may be true that in the case of *basic group 3* especially the applied tools in this group did not purposeful but rather diffusely stimulate the initial low-score facets. However, the variety of effects of qualitative instruments, the non-transparent cognitive processes of individuals and the difficulties in measuring the influencing intensity and mode of action of participatory tools rather indicate that the diffuse powers of influence are of systematical nature. It is exactly these inscrutable aspects of participatory tools that carry the risk of undesired influences and misuse.

– **Cross-checking self-evaluation and external assessment**

At cross-checking the results of the self-evaluation about motivation intensities of basic motivation facets with motivation degrees of questionnaire part I ('basic motivation') the latter can (if at all) only partially be validated by the self-evaluation. The main tendencies of changes of single facet scores correspond for most of the basic motivation facets in the case of *basic group 2* and *basic group 4*. The self-evaluation corresponds also in the case of *basic group 5* where no remarkable changes are to be observed neither in the external assessment nor in the self-evaluation. For the remaining *basic groups* the main tendencies of change in the self-evaluation do almost not or not correspond to the main tendencies of changes in the external assessment at all.

Besides the opposing assessment forms of subjective self-evaluation and objective external measurement of basic motivation the discrepancies in changes of single facet scores arise from the differing subjects that the evaluation forms assess (motivation intensity vs. motivation degree) and their different measuring scales (verbal bipolar 7-point rating scale vs. numeric unipolar 5-point rating scale). Thus they are practically difficult to compare. Furthermore, variances between the both assessment forms can also be caused through varying item wordings¹⁶⁷.

Nevertheless, seen individually the self-evaluation reveals data that are related to single facet scores as well as trends in changes of single facet scores in the pre- and post-survey which are insightful for the interpretation of the external evaluation. The following table 22 presents the changes of frequency rates of the maximum score (frequency of answers that were scored with 5 points) for all *basic groups* and for each basic motivation facet (f1 to f9). Analogically to the translation of motivation degrees the highest score of 5 points per facet is interpretable as the highest motivation intensity of the facet while 1 point per facet should be understood as lowest motivation intensity.

Table 22: Frequency of maximum scores in pre- and post-survey of questionnaire part III 'self-evaluation basic motivation'

	Pre-survey	Post-survey	
Facet no.	Frequency of 5-points answers (in %)	Frequency of 5-points answers (in %)	Change (in %)
f1 (Confidence in Success)	77.6	85.7	8.1
f2 (Goal Setting)	83.7	91.8	8.1
f3 (Self Control)	87.8	91.8	4
f4 (Eagerness to Learn)	85.7	85.7	0
f5 (Flexibility)	63.3	69.4	6.1
f6 (Fearlessness)	79.6	87.8	8.2
f7 (Competitiveness)	77.6	79.6	2
f8 (Pride in Productivity)	87.8	81.6	-6.2
f9 (Compensatory Effort)	75.5	85.7	10.2

Source: ZAHUMENSKY 2013

All basic motivation facets show a frequency of the optimum score of at least 75 % in the pre-survey and at least round 80 % in the post-survey, except the facet *Flexibility* (f5).

¹⁶⁷ There was not applied a statistical technique with regard to item analysis during the item construction of the motivation questionnaire part I and II that would have measured whether the items accurately measure the respective motivation facet.

The percentage of 5-points answers of this facet is significantly lower in both pre- and post-survey. This information reinforces the results of the external evaluation of questionnaire part I of the facet *Flexibility*. There the throughout lower *Flexibility* scores were also striking and it was thoroughly elaborated that these principally relative low-scores can be ascribed to the question design (catch question). However, the summarized results of the self-evaluation suggest the interpretation that the facet *Flexibility* is actually a low-score basic motivation facet among all surveyed farmers and that the question design can be considered as having had a reinforcing effect.

Another relevant insight is that the facet *Pride in Productivity* (PP) is the only facet that in sum shows a decreased percentage of maximum scores in the post-survey. This worsening trend of PP was also observable in the external assessment of questionnaire part I. In this context the external assessment corresponds to the self-evaluation and thus it can be considered as validating general trends of changes in single facet scores of the external assessment of basic motivation.

In addition, especially the facet *Compensatory Effort* (CE) entails the highest change rate towards maximum scores of 5 points in the post-survey of the self-evaluation (10.2 % more 5-points answers). It is very important finding that the participatory workshops influenced farmers insofar as they themselves estimate the motivation intensity of *Compensatory Effort* much more often with the maximum score after they have experienced participatory tools. The increased frequency of high scores in CE leads to the conclusion that the farmers evaluate themselves after the participatory workshops as much more motivated by the fear of failure. At the same time this entails a positive aspect since CE is a *constructive* coping strategy where task accomplishment takes place without decreasing the aspiration level. Having subjectively stimulated constructive coping strategies among all surveyed farmers can be considered as a very good effect of participatory tools.

– **The relevance of PTD-experience**

Table 21 discloses that there are only remarkable changes in degrees of motivation for participation in *basic groups* 1 and 2. The presence of experience with the FiBL/ bioRe-PTD-project seems to be a substantial factor with regard to an improved degree of motivation for participation. Obviously only the PTD-experienced farmers (at the time of the case study these were *basic groups* 1 and 2) present increased motivation degrees in motivation for participation in participatory research.

The PTD-experienced farmers are on the one hand assumed to have discovered the potential of participatory working for their benefit and on the other hand they are assumed to have internalized participatory philosophy and working at least in some degree. Yet, the most important perception in this context is that it is probably the proof of benefits of participatory research that can significantly contribute to an increased motivation for proactive participation among farmers. From this can be derived that the *methodology*

(participatory tools) can influence basic motivation and draw or increase interest in participatory research. Nevertheless, the first stimulation of real pro-active participation can rather be ascribed to the exposure of the *content-related outcomes* of the participatory research. This is underlined by the finding that it is very common attitude among bioRe farmers of being bioRe *organic* farmer due to lacking alternatives of conventional farming. Hence, motivation for pro-active participation out of deep conviction about participatory working and philosophy among the surveyed farmers presents a much more advanced stadium of participation.

7.4 Discussing the results against the backdrop of post-development criticism

The starting point of the investigations of the present case study by order of the SWISS RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL) was the task to survey aspects of how to (systematically) motivate bioRe organic farmers for pro-active participation in the participatory agricultural research project in India (FiBL/ bioRe PTD-project) in the context of FiBL's long-term experiment (LTE) about *Farming Systems Comparison in the Tropics*. Since the present case study was realized in the context of geographic development research these investigations will finally be discussed with regard to development discourse.

This task turned out to be a very complex undertaking since *Participatory Technology Development* (PTD) generally is located at the interface of various topics such as agriculture, participation, research and development. Furthermore, the central topic of motivation enlarges this network to an innovative linkage of subjects. Despite the difficulty of measuring motivation for participation two of the other topics turned out to represent very vague concepts due to their value dependency as well as due to a variety of possible interpretations as it applies to development and participation. However, although their programs may differ all topics have major objectives in common: along with the inducement of social change, active involvement of local people and a general strong user-orientation of activities, emancipation and transformation of decisive power to target groups, empowerment of local people for self-reliant solution finding of their problems and for the improvement of their livelihoods are crucial goals of all interrelated subjects (except motivational research).

On the one hand these objectives are very ambitious and on the other hand they presume a very high degree of self-responsibility and active engagement of local people. Yet, from FiBL's perspective the degree of individual motivation for active engagement of Indian bioRe organic PTD-farmers in the on-farm component of the FiBL/ bioRe PTD-project obviously is considered as being in need of improvement. Improving the participants' motivation degree in this context is not to be compared to a quantitative enlargement of the target group or to an increased quantity of delivered innovative technologies. These multiplication effects are rather subsequent objectives. After all, PTD commonly runs the risk

of a one-sided interpretation as a methodology for technology generation. Yet, outcomes on product level are advanced PTD-outcomes, and the procedural (qualitative) participatory component should be stressed to equal shares. At this point the hub of the case study appears clearly because the research question that was posed by FiBL displays a mainstream understanding of participatory methodologies that includes the presumption of uncontested omnipotent beneficial effects of participatory tools.

– **What is the 'post-development counter question' with regard to the case study?**

Post-development represents a radical form of criticism on the non-questioning of uncontested benefits of development. The author sees a strong analogy between the subject of post-development criticism on the development paradigm and the participation paradigm in development discourse. Almost all points of criticism of post-development on mainstream development apply to mainstream participation. Similar to mainstream development participation entails a high susceptibility to misconception, misuse, dysfunctions, perpetuation of unequal power relations, infiltration of external needs, exclusion of marginalized population groups, a lacking valorization of traditional indigenous knowledge systems, and so on. Due to these possible malfunctions, post-development voices the claim for radical democracy, decentralization and emancipation of local people in countries of the South. Its defined goal is the retreat of outsiders with respect to development interventions, and to leave collective solution finding or construction of alternatives to those affected. Yet, this demand for self-dependent action is related with the demand for high degrees of individuals' pro-active engagement in social life. This, in turn, urges advanced and skilled (participatory) capabilities from local people.

The central question - the 'post-development counter question' - at this juncture is how people can practice radical democracy (and associated active participation in public social life) if they lack skills to make adequate use of functional democratic structures or institutions or if they have a limited understanding or if they are not able to seize spaces for participation? In principal, there is broad consensus about the presumption that traditional cultures naturally command capabilities of self-defense, self-recovery, collective apprenticeship and problem-solving capacities. Nevertheless, even post-development admits that these capabilities often have been lost over time (due to Western modern influences in the context of development interventions). This insight becomes even more relevant in the Indian context of still prevailing rigid hierarchical social structures with a consolidated tradition of unquestioning acceptance. Not knowing how to articulate the own needs and how to take over control and responsibility in different spheres of social life is assumed to be very common among Indian rural people as the share of illiterate men in rural areas, and especially of illiterate women, is proportionally high. Probably, the faith in one's self truth and strength is also affected due to the daily struggle for survival of many of rural Indians.

For now it is irrelevant whether the complicated public participation of (rural) local people is caused by endogenous factors and/ or exogenous factors. The author holds the opinion that people cannot be left alone with the challenge to self-dependently and autonomously solve their urgent problems and to induce social change by themselves. This claim appears insupportable - even almost impossible - in times of multilayered and strong global-local linkages. It displays a lack of solidarity and social responsibility of advantaged ('developed') countries of the North, as well as it does not represent an alternative to development. Inducing social change must not be understood as one-sided activity of local people. It rather urges the initiation of processes of change and learning processes of the entire global community. From this follows that outsiders should not be excluded from solution finding processes in countries of the South since by this way gained knowledge can be shared and mutual learning is more likely to occur.

The above referred counter question is designated as 'post-development question' because post-development's approach is defined as 'radical' (going to the roots of the topic), as 'subversive' (looking at a situation from another side), and 'human-centered' (taking the perspective of the humans involved in the process). In the proper meaning of these terms the case study followed a 'post-developmental-ist-interdisciplinary-mixed-method-participatory-action-research-approach' since the fundamental questions are posed *whether participatory tools have effects at all, whether they are measurable at all, whether they are beneficial at all, whether they are suitable for the target groups at all, and what and how should be motivated at all?*

Hence, FiBL's research question of "*How to motivate farmers for participation?*" could not be merely understood as surveying how to motivate the farmers *to join* the FiBL/bioRe-PTD project. That would represent an objective that is oriented on development practice. To the contrary, FiBL's research question rather opened up myriads of research questions that could have been surveyed (or still can be surveyed) each of them separately in one research paper. In this work, it was tried to explore them all together. It is self-evident that there cannot be delivered one overarching answer.

– **PTD as hybrid mixture of people's autonomy and outside interference**

In the context of the case study post-development critiques are applied to participatory research activities instead to development interventions. The procedure and goals of development and research differ. While participatory development rather aims at the involvement of local people in a (maybe predefined) project participatory research aims at knowledge production and the joint development of solutions. Research is assumed to naturally operate in a more objective and rather apolitical way. Although this can be a disadvantage (extractive research approach) it can also be advantageous in the sense of leaving the most possible self-responsibility and self-determination to the subjects of research. Hence, participatory research appears as the surely most suitable scientific

approach that combines the free development of endogenous solution finding potentials with external stimulation for the mutual benefit of gaining knowledge about the improvement of local conditions and the achievement of social standards.

In this paper *Participatory Technology Development* is understood as methodology for the external stimulation of lost or forgotten self-organizing capabilities of local people. This implies nothing else than stimulating intrinsic motivational forces for goal-directed action or pro-active participation that allows for the self-dependent and self-reliant solution finding. As it was illustrated in chapter 4 motivation mechanisms depend on both external stimuli and internal cognitive processes that base on individual motives as source of impetus. Such motivational forces depend on inner personal tensions that specific needs cause, on the valence that a goal objective is attributed, and on the distance of a person from the goal. The motivational force is greatest the closer one is to the goal as well as the higher is the tension and the valence attribution, respectively. The motivational forces lead to a self-evaluation of competencies that initiates a behavior that is driven by varying motives.

Stimulating the processes of conscious and rationale calculation about goal-directed action cannot be interpreted as violation of the personal autonomy of local people. To the contrary, increased consciousness increases the ability of the self-dependent decision of individuals about *where*, *how* and *why* to participate. At this, the approach of a legitimate external involvement in endogenous processes of change does not conflict with a very constructive position of post-development, namely the position of ARTURO ESCOBAR. ESCOBAR indicates the possibility of 'hybrid solutions', i.e. the capacity of transformative engagement of traditional cultures with modernity. Such a mixture of tradition (endogenous knowledge and capacities) and modernity (external knowledge and capacities) represents the continuous attempt for renovation and innovative solution finding. To the mind of the author of this paper this beneficial interrelation should be understood as reciprocal. Thus, in general, people's autonomy can indeed be related with external activities in a positive and legitimate way.

– **The potential of PTD to fulfill post-development goals**

Post-development sets various objectives that are related with the claim for radical direct democracy. Generally, post-development stresses the self-regulating forces of traditional cultures as problem-solver. According to post-development, development (and analogically research) ideals should be determined autonomously at the roots. In doing so, local people are ought to rely less on outsider's expert knowledge. All persons involved should revalorize traditional indigenous cultures and their knowledge systems or ways of knowledge generation. If these guidelines are followed individuals can be empowered to create a better life for themselves and those around them. One premise for post-development's program is the faith in one's own strength and the capability of local

grassroots movements to articulate alternative solutions to their problems. Those groups should seize opportunities for the construction of innovative visions and practices. In case these capabilities are not strong enough or even absent local individuals or groups should be empowered for the collective construction of alternatives. Taking over ownership and regaining decisive power then clears the way for the execution of self-determined direct democracy.

As a matter of fact *Participatory Technology Development* (PTD) entails great potential for the intrinsic motivation of people's active engagement, for self-mobilization, and long-term empowerment since it intensely addresses the individual engagement of farmers into the research process. In PTD empowerment is not only understood as techno-economic empowerment (capability to generate innovative agricultural techniques = products) but also as socio-cultural empowerment (capability of self-reliant action = process). Besides, in PTD, the chance is high that its innovative outcomes on product and process level are granted to the locals. Hence, PTD is a suitable methodology to combine a researcher's objectives of knowledge generation and data collection with an anthropologist's objectives of creating the basis of self-determination and freedom of choice provided the pro-active engagement of local people is high. It is thus worth, trying to stimulate the intrinsic motivation for participation of the case study's target group. Only this active participation can optimize the degree of ownership of the target groups and can ensure that the research activities take place according to local people's needs. Yet, a premise for this is the definition of participation as cooperative or collaborative teamwork.

The present case study approaches empowerment at a very elementary base on individual level. Empowerment of individuals and groups is outlined as individual and group-wise motivation. Motivational forces were detected with a standardized questionnaire that allows for the generation of data about motivation degrees. The PTD-tools that were applied during the workshop phase of the case study were assumed to positively stimulate individuals' basic motivation degrees as well as degrees of motivation for participation. The changes in motivation degrees before and after the participants of the case study have experienced participatory tools are interpreted as direct effects of participatory tools. They are now equalized with individuals' very basic empowerment for pro-active participation and the associated capability to self-dependently exercise activities which may initiate social change, endogenous problem-solving and sustainable self-organization of local people. The in this way gained general empowerment/ motivation is assumed to be very beneficial for outcomes on product level of the FiBL/ bioRe PTD-project.

– **Could post-development goals actually be achieved?**

It was interpreted as being principally legitimate that outsiders at least can give an external impulse that empowers local people and that opens up spaces for self-mobilization and self-motivation in the sense of getting more self-confidence. Such an impulse can entail

stimulating individuals' motivation for active engagement and *conscientization* about their rights, their knowledge and their endogenous potential for problem-solving (recalling the forgotten self-recovering capabilities). Yet, this impulse imperatively has to take place under the highest possible cultural sensitivity and with the less possible external influence.

The case study theoretically could start to stimulate individuals on three levels that influence the magnitude of the motivational force: in the range of valence attribution to the goal object, in the range of the distance the participants have to the goal, and in the range of the perceived tension that is generated by the need. In this line the valence attribution seems to be the element that could most easily be stimulated from outside. While the tension of a need is an inner personal element which is difficult to stimulate reducing the distance to the goal, and hence reducing demotivation, is at least worth striving for. Reducing the distance to the goal means improving the participants' livelihoods and, more precisely, increasing yields or crop quality, improving pest-resistance of crops, reducing production costs, or raising market prices. The potential of PTD to directly influence some of these objectives is high even within a relative short time span since especially the crop related influences can be observed within one or two seasons. Other wide-ranging objectives are more difficult to achieve since they interfere with other spheres of social life such as politics and economy. Hence, the case study focused on the stimulation of the valence attribution to participatory tools and participatory working because this was the starting point that was assumed to be the most easiest to stimulate.

All things considered, during the qualitative evaluation great enthusiasm and acceptance among the participants of the participatory workshops could be observed. The farmers as well as the bioRe agricultural extensionists confirmed that they appreciated working with participatory tools due to their easy application and great potential for the consultation of farmers' needs and visions. The final tool of the final workshop of all PTD-farmers, the PTD-exposition, revealed that farmers seek for the meeting with other PTD-farmers of other villages for exchange purposes. The same can be derived from the favorite PTD-tool namely *Field Visit*. It allows for exchange of big groups and conveys a feeling of being a group that entails power for change due to the potential of pooling forces. Informal observations in combination with the *points evaluations* of the workshop phase generally point on a positive valence attribution to participatory tools, and especially to methods that allow for broad exchange in the field.

The quantitative evaluation disclosed very high average total motivation degrees among the surveyed farmers groups and mostly increased motivation degrees after the participants have experienced participatory workshops (cf. table 21) There is evidence about the stimulation of motivation for participation (questionnaire part II) of the most advanced and most PTD-experienced farmers of *basic groups* 1 and 2. The other *basic groups* obviously could rather be stimulated in their basic motivation (questionnaire part I). In turn, the basic motivation degree of the most advanced and most PTD-experienced farmer group (*basic*

group 1) practically did not change after the workshop phase. Hence, there seems to be a correlation between PTD-experience and locus of motivational stimulation. Therefore it can be assumed that the more participatory experience the farmers have the more likely is their stimulation for pro-active participation. With regard to valence attribution to participatory working this means that the more the surveyed farmers are familiar with participatory tools the more probably they attribute a high positive valence to them and thus the more probably they use participatory working as a platform for active engagement.

In general, it can be followed that positive valence attribution that has effects on increased pro-active engagement in the FiBL/ bioRe PTD-project can be stimulated during participatory workshops rather among advanced and PTD-experienced farmers. Meanwhile, inexperienced farmers' valence attribution can be rather stimulated with regard to basic motivation facets.

Summarized the case study disclosed sources and ways of optimizing motivational stimulation through participatory tools. PTD-tools are suitable instruments for increasing motivation degrees, and as a consequence PTD-tools can improve the *base* for pro-active participation and engagement in activities of the FiBL/ bioRe PTD-project. The case study discloses even indicators for a more pro-active behavior among more PTD-experienced farmers provided they are offered a platform for active participation. Nevertheless, there is no evidence about whether the participants of the case study constantly make and/ or will make use of the offered ways of actively engaging into the research processes or of participating in other social spheres. This will also strongly depend on the valence attribution to the PTD-outcome on product level. Hence, the PTD-topics should always be selected according to farmers' needs and interests.

It is not easy to make a definitive verdict about whether creating the *base* for pro-active participation conflicts with post-development credos. It was already elaborated that motivational stimuli are always of external nature. Even intrinsic motivation does not occur in a (social) vacuum but depends on environmental stimuli that initiate internal cognitive motivational processes. The external stimulation of intrinsic motivation can be justified as long as the external stimulation takes place in a very sensitive and objective way. Finally, a 100% interest neutral and value neutral external stimulation cannot be guaranteed. Therefore, in the strict sense of post-development criticism the external motivational stimulation through PTD-tool is not legitimate. Although the *base* for post-development objectives such as revalorization of indigenous knowledge, self-organization, and empowerment can be considered as being achieved through participatory tools the *way* of how the base was created conflicts with strict post-development philosophy.

From participatory practice, however, PTD as it was applied during the case study can be designated as success since stimulation of basic motivation and/ or motivation for participation definitely took place during the workshop phase. Accordingly, post-development objectives can be considered as being achieved.

– **Sustainability of participatory practice at bioRe and in the FiBL/bioRe research project**
(Semi-structured interviews with Mr. HOHMANN from REMEI AG Switzerland¹⁶⁸ and with Mr. RAWAL from bioRe India Ltd./ bioRe Association India¹⁶⁹)

At the end, the case study cannot make forward-looking statements about the sustainability of direct beneficial effects of the participatory tools that were applied during the workshop phase. This is only possible through further assessments about motivation degrees, further investigations about changes in motivation degrees and their comparison with the results of the present survey. Sustainability, however, is an implicit claim of post-development since autonomous problem-solving of local people includes the premise of a long-lasting retention of these self-dependent problem-solving capabilities. This involves an institutionalization of participatory practice as well as a running multiplication and a spread across the research region.

In order to better judge the contribution of the participatory workshops in the context of the FiBL/ bioRe PTD-research project with regard to the achievement of social sustainability standards such as participation at bioRe two semi-structured interviews with the chief executive officers (CEOs) of REMEI AG, Mr. PATRICK HOHMANN, and bioRe Ltd./ bioRe Association, Mr. VIVEK RAWAL, will be addressed in the following. Both interviewees are acknowledgeable about local culture and participation issues.

According to Mr. HOHMANN, CEO at REMEI AG, parent company of bioRe®, a premise for the sustainability of participation in the research area is that local people generally demand for participation. Besides, the demand of locals acts as a mandate to legitimately facilitate participation from outside since voicing the demand bears witness to a self-paced source of impetus, i.e. asking for participation from intrinsic motivation. To Mr. HOHMANN stimulating bioRe farmers' and bioRe staff's demand for participation through 'asking' f.i. about their needs or desires appears legitimate provided participation is desired by all persons involved. Albeit, Mr. HOHMANN stresses, that once outsiders are awarded with the mandate to promote participatory working their task should be limited to the creation of spaces where the participants can apply themselves. It is in the farmers' business to seize these spaces for the creation of their environment according to their needs. Evidently, the participatory workshops that were realized during the case study offered such spaces for the articulation of demands for the active engagement of the participating farmers.¹⁷⁰

¹⁶⁸ Semi-structured interview conducted 12/14/2010 at REMEI AG office, Rotkreuz, Switzerland. For the guide of the guided interview see annex 4 (German language).

¹⁶⁹ Semi-structured interview conducted 11/3/2010 at bioRe Association office, Kasrawad, India. For the guide of the guided interview see annex 5 (English language).

¹⁷⁰ The PTD-farmers readily grasped the opportunity for broad exchange of PTD-experiences and results, for discussion of the project design, for information gathering, and for action planning. After the final workshop of all PTD-farmers (PTD-exposition) some of them even met for the purpose of planning a request related to price policies at bioRe India Ltd.

Moreover, from Mr. HOHMANN's view rendering participation sustainable is not exclusively a task of bioRe organic farmers but it urges the conviction and the engagement of all bioRe staff members. At this, Mr. HOHMANN allots an important role to bioRe agricultural extensionists since they are the mediators between bioRe farmers and bioRe management. Besides, they are the persons who are in close contact with the bioRe farmers. Thus they are assumed to have the deepest understanding of farmers' needs and visions. Mr. HOHMANN additionally informed that the important role of bioRe extensionists had become obvious as in the past the strict observance of organic cotton production standards had to be controlled by agricultural extensionists, who, over time, had been busier with the controlling of bioRe farmers instead of advising them. This had resulted in certain general mistrust in bioRe extensionists as well as in a resistance to advice and tiredness about responding to questions. It was observable during the case study that also the extensionists signaled a demotivated consultancy behavior. According to Mr. HOHMANN, these are the reasons why bioRe agricultural extensionists are the key persons from where the participatory approach at bioRe India Ltd. should start in order to ensure its multiplication, its consolidation and thus its sustainability. In this respect the case study revealed that especially the extensionists turned out to be very interested in participatory working, and they acknowledged the potential of participatory practice for the improvement of their consulting activity. They also replied that participatory workshops would improve the relationship between bioRe organic cotton farmers and extensionists in general since extensionists could change their controlling image to an image of facilitating the farmers' independent commitment. Obviously such improvement is demanded from the base of bioRe Ltd. since the PTD-farmers also voiced that they appreciated participatory working very much. As a matter of fact, from Mr. HOHMANN's experience there does already exist a basic participation culture and a will for active engagement among bioRe organic farmers in the research region¹⁷¹. However, it is probably not the majority of bioRe organic farmers who command the skills of questioning local conditions and of finding solutions for their problems. Therefore, institutionalizing participatory working at bioRe India Ltd. and at bioRe Association is a process that faces various hindrances with respect to basic motivation and consciousness.

Finally, Mr. HOHMANN voiced that at the moment after the case study he had the impression that at bioRe India Ltd. the moment of consciousness rising about the importance of the achievement of social sustainability standards such as long-term and pro-active participation structures had come and that the Indian bioRe team demanded for

¹⁷¹ During the semi-structured interview he mentioned that the interest in organic cotton production in the research area emerged from local farmers themselves as they were searching for alternatives to conventional farming that in the past renownedly resulted in miserable yields. BioRe®, hence, evolved out of local farmers' demand for agricultural alternatives such as organic farming that, later, disembogued in a business concept. The multiplication of the organic cotton idea occurred without external incentives. It is therefore evident that a certain spirit of pro-active and self-dependent engagement is already pre-existent among bioRe organic farmers and that they just need to be offered spaces.

changes with regard to participation at bioRe India Ltd.. He also remarked that REMEI had waited for this moment already for a long time.

The author of this paper assumes that it would be coincidence if mere 'asking' and waiting for people's demand for participation - that over a long period apparently did not lead to the practical demand for participation - shall *right now* have led to the pronouncement of the demand for participation at the same time as the case study has ended. Hence, there must be causality between the participatory PTD-workshops of the case study and this increased awareness among bioRe members. One can even go so far as to assume that the case study that has been realized in the context of the FiBL/ bioRe participatory research has substantially facilitated, if not even initiated, the pronouncement of local bioRe members' needs and the demand for participation since it created the platform for collective action and articulation.

Furthermore, it is also evident that the majority of persons who *experienced* participatory tools during the case study want to continue with participatory practice. It is very likely that the participatory workshops increased the interest in participatory practice because the participants *experienced* the associated tools in practice. By this way they gathered information about the potentials of participatory tools and hence they were able to judge whether they want to continue with participatory working or not. Those people are predominantly people who are at the bottom of bioRe such as farmers or partially the agricultural extensionists. Whereas, bioRe members with important functions or leading roles were not even consulted or involved in the participatory process during the case study. Hence, they may not be interested very much in participatory practice as they did not *experience* it. Since people at the bottom apparently needed stimulation from outside (i.e. *experiencing* participatory tools for the first time) in order to decide if participation is a desirable methodology or not managerial staff is assumed to need outside stimulation, too, in order to ask themselves if they want participation or not. Consequently, the stimulation of critical weighing about the demand for participation took place and can take place through *experiencing* participatory tools in practice. The exposure to participatory tools initiates a reflecting process that creates the general base for long-term participation: for critical consciousness, for questioning the local situation, for the articulation of local needs and desires.

However, asking the local people for their needs implies that they are interested in and able to ask themselves what they need or what they want. This raises another hindrance of consolidating participatory practice in the research region. Mr. RAWAL, CEO at bioRe Ltd. and CEO at bioRe Association, explained during a semi-structured interview at the end of the case study that "People think asking is only for asking. But they don't consider that asking can change something in their life. That is why they are bored about asking and being asked." In consideration of this estimation about local peoples' attitude stimulating their participation by asking seems to be foredoomed to fail. Due to the low interest in asking

questions and responding to questions people often don't open for honest answers and just say 'yes' when they are asked about something. Mr. RAWAL hence agrees with the distinct *acquiescence tendency* of response sets among the surveyed farmers, and he adds that participatory workshops may contribute to the creation of spaces for trust and openness among all persons involved in the participatory process. Such favorable ambience is important in order to give honest answers and subsequently in order to pose honest questions. According to Mr. RAWAL for sustainability purposes of long-term pro-active participation of bioRe organic farmers it is thus crucial to stimulate the farmers' motivation to give (honest) answers.

From this follows that raising the consciousness about the importance and quality of responses and answers among the participating farmers can be considered as very basic task of participatory workshops in the research region. The FiBL/ bioRe research project about experimentation with soil treatments seems to be a predestinated platform in order to stimulate such basic skills among bioRe organic PTD-farmers and the FiBL/ bioRe research staff since during the whole *Participatory Technology Development* process many questions about crop performance and treatment performances are asked. The PTD-farmers are throughout very interested in these questions since they are of their daily concern. Crop-related topics are farmer's topics and can therefore open spaces for the discussion of sustainability issues. Moreover, PTD intensely addresses farmers' crop-related observation and analyzing skills. It is self-evident that, if at all, farmers will in the first instance participate in an activity where they can apply their professional crop-related observation and analyzing skills with the prospect of crop-related benefit. This represents an entry point for motivation efforts.

The case study gave evidence to changes in motivation scores, and it was thoroughly elaborated that they are not only interpretable as increased basic motivation or increased motivation for participation. To the contrary, decreased motivation scores of single *basic groups* were also interpreted as increased consciousness about critical responding and critical questioning in the course of the case study. Since both could be achieved - de facto increased motivation degrees as well as at least increased consciousness in the case of decreased motivation degrees - it can be considered as evident that the basis for participation among all surveyed farmers could be stimulated. Consequently, the basis for the sustainability of participation could be stimulated through participatory tools in the context of the FiBL/ bioRe PTD-research project.

Besides, from this perspective the participatory workshops accomplished something that other tools of agricultural extension (such as *Farmer Field Schools (FFSs)*¹⁷²) or management techniques (stimulating by asking) were not able to stimulate. Yet, it cannot be

¹⁷² The *Farmer Field School (FFS)* is an alternative agricultural extension approach where "a group of farmers gets together in one of their own fields to learn about their crops and things that affect them. They learn how to farm better by observing, analysing and trying out new ideas on their own fields." (FAO 2013)

finally answered whether the participatory PTD-workshops stimulated the demand for participation, whether the workshops offered the space for the articulation of the demand or whether the demand was already voiced but just not heard by those responsible. It is probably a mixture of all forms of facilitation.

In case the latter assumption applies it can be traced back to a lack of skills and a lack of knowledge among bioRe managerial staff and FiBL/ bioRe research team about how to inquire bioRe members' needs and how to motivate them to articulate their demands when they are asked, and asking the right questions, respectively. At this the internalization of the reciprocity of participatory processes plays a vital role. This involves the qualification of individuals who hold executive positions. Offering ongoing capacity building in participatory practice is thus also a key aspect in order to render the FiBL/bioRe (research) efforts for the achievement of long-term social sustainability standards such as participation really sustainable.

Summary Chapter 7

In chapter 7 debatable findings of the case study were discussed. There were addressed general limitations of the collaboration of Indian and German members of the research team (selectivity of translation and information) as well as limitations of the cooperation between research staff and surveyed farmers (underestimation of farmers, diverging knowledge systems). Findings from the qualitative evaluation gave occasion to the discussion about the appropriateness of the workshop design as well as about the problem of the heterogeneous composition of the surveyed farmer groups that probably had effects on the results of the case study. Moreover, the fundamental dilemma of the mixed method approach that combines different research objectives and procedures could be cleared up.

With regard to the farmers' preference of tools it was deduced that there can hardly be made statements about the preference of single tools (except the evident preference of *Field Visits*) but rather on types of tools. Even debatable findings point at the fact that apparently the more advanced and more PTD-experienced farmers prefer plenary tools while the less advanced and less PTD-experienced farmers prefer tools that are applied in small groups.

During the quantitative evaluation of motivation degrees there also emerged debatable findings. One of the probably most result-influencing aspects is the identified strong *acquiescence tendency* of response sets among the surveyed farmers. In order to avoid a distortion of results this finding found considerable attention during the interpretation of results from the measurement of motivation degrees before and after participants have experienced participatory tools. Yet, even debatable findings strengthened the interpretation of high scores rather as 'hidden low scores', and the interpretation of decreased scores in the post-survey rather as increased consciousness.

The detailed discussion of results opened up the discussion of very fundamental but questionable premises of the case study with regard to locus and modus of effects of participatory tools, in particular the assumption that they have direct, targeted and beneficial effects on participants. This fundamental discussion bridges the small-scale survey in the context of the case study with the broadly based research question of this work about whether participatory tools in general are suitable instruments for basic empowerment (and associated motivation for participation) of local people and if they are legitimate instruments at all. These questions were discussed with regard to claims and objectives of post-development critiques on mainstream development discourse. The discussion was closed with the conclusion that most of post-development objectives could be achieved. Especially the basis for the sustainable consolidation of participatory practice in the research region, i.e. long-term empowerment for active engagement, for critical questioning and increased consciousness among the surveyed farmers, could be stimulated through participatory tools that have been applied in the context of the PTD-research component of the FiBL/ bioRe participatory research project.

If participatory tools are considered as legitimate or not could not be finally answered in an objective way. As a matter of fact the findings of the case study revealed that they can advance something as opposed to other methods that often remain effectless or at least take a long time to induce (social) change. From a practical perspective, the external stimulation of critical consciousness appears as the more attractive alternative to development interventions than waiting for the (often forgotten) self-recovery capabilities of local people to take full effects.

8. Recommendations

In order to make grounded recommendations for the FiBL/ bioRe PTD-project with regard to motivation for participation of farmers it was necessary to get a detailed understanding of motivation and its correlation with farmers' participation, to gather lots of data about the origin and effects of motivational forces as well as about the *locus* and *modus* mechanisms of motivation for participation. The manifold findings from the case study now disembody in concrete recommendations about participatory practice in general at bioRe Ltd. and bioRe Association as well as about *Participatory Technology Development* (PTD) in the FiBL/ bioRe PTD-research project.

8.1 Recommendations for bioRe India Ltd., bioRe Association India, and for REMEI AG

Mr. HOHMANN, CEO at REMEI AG, disclosed during the semi-structured interview that was conducted in the context of the case study that it was REMEI's intention to initiate participatory processes at bioRe Ltd. and bioRe Association since some time past. At this, Mr. HOHMANN as representative for REMEI AG followed the approach of waiting for the demand for participation of bioRe staff and 'stimulating by asking'. Theoretically this position is very consequent, elaborated and worthy of support. It bears witness to a matured reflection about participation issues. Yet, it is a theoretical approach that tries to avoid any kind of external influence. Beyond a doubt, this would be the optimal procedure to initiate participatory processes. Yet, in practice, this may be a long-lasting method that conflicts with the necessity of prompt solution finding of urging problems that bioRe organic farmers face day after day. Furthermore, the realization that local people are demotivated in being asked and giving answers complicates this approach considerably.

Hence, the results of the case study suggest that offering participatory workshops is the more effective way of initiating participatory processes since local people get a notion about participatory practice and philosophy. Such *experience* with participatory tools allows them to ask themselves if they want participation or not and to clearly articulate their demand. Local people thus apparently *need to be exposed* to participatory practice in order to judge about it.

Moreover, participatory workshops open up spaces for the articulation of demands and needs. It is well imaginable that the demand for participation was already preexistent (Mr. HOHMANN's experiences about the motivation of local farmers in getting pro-active and looking for alternatives to local conditions is indicative for this) but it was just not heard or voiced. Therefore, the platforms of exchange and articulation should be constantly offered in order to hear the demand of bioRe farmers and in order to enable farmers to articulate themselves. For these reasons, bioRe staff should be enabled to listen to bioRe farmers and

to take their concerns seriously. Capacity building, hence, is a crucial starting point for the initiation and the consolidation of participation at bioRe Ltd. and bioRe Association. Problems in communication can be overcome through participatory workshops provided spaces of trust can be created. As Mr. HOHMANN already admitted, the bioRe agricultural extension workers play a vital role in this respect since they act as mediators between farmers and managerial staff. Much effort should therefore be spent for the capacity building of bioRe extensionists since they can change the consulting quality of farmers. The chance is high that through turning the bioRe agricultural consulting activities more participatory this will significantly positively influence the motivation degrees of farmers and their honest questioning/ responding. Besides, although participatory tools seem easy to apply, their skilled application must not be underestimated. Capacity building therefore should take place carefully and intensively.

Another very positive moment of REMEI's approach is the attempt to tackle the initiation of participation processes from the top, i.e. at the management floors. This shows that participation is envisaged not only from farmers' side and that the reciprocity of participatory processes is already acknowledged. This approach should by all means be pursued. Yet, likewise the bioRe farmers, those bioRe staff members should also *be exposed to* participatory practice in order to reflect potentials and limitations as well as for the purpose of reducing skepticism towards participatory tools. During the case study the author of this work had the impression that skepticism towards participation among bioRe office employees is partially quite high due to a lack of information about participatory philosophy.

Closing the recommendations for REMEI and bioRe the author concludes that in order to stimulate motivation for participation bioRe farmers should be addressed with topics of their interest. Crop-related issues as they are treated during the PTD-project are therefore predestinated entry points. At stimulating farmers' very beginning long-term participation it is in the first instance not relevant whether they actively participate out of deep conviction about participation philosophy (that is anyway less likely) or whether they participate out of the prospect for crop-related benefits (this is more likely). The motive for participation is, in the first instance, irrelevant. The main point is that they somehow participate. Reflection and consciousness will increase with the increased degree of participation and over time the motives may change to participation from conviction due to the evidence about benefits of *Participatory Technology Development*. It may thus be possible that the FiBL/ bioRe participatory research has more than an accompanying function.

8.2 Recommendations for the RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL)

As a matter of fact the research question that was posed in 2010 by FiBL was related to an advanced level of participation. At the same time the actual stadium of participatory practice in the FiBL/ bioRe PTD-research project was at the very beginning. During the case study it became apparent that the research question of *How to motivate farmers for participation?* could not be answered without beforehand obtaining more information about *How farmers are actually motivated?* Such basic information was not available during the case study and thus still had to be assessed *after* the *basic groups* have been arranged. For further investigations the author therefore recommends to assess motivation types *before* the farmers are grouped in order to ensure an adequate grouping of as homogenous motivation types as possible. This will also allow for the development of an appropriate workshop design according to each motivation type. By this way the likelihood to apply participatory tools in a targeted way (i.e. in our case to stimulate motivational forces) is highest.

Another corner point with regard to FiBL's efforts for participation in the Indian context is that, at least at the time of the case study, there were several signs for a mainstream and rather one-sided understanding of PTD as methodology for technology generation at FiBL. The tendency of underestimating outcomes on process level is probably due to a lack of experiences with participatory practice, a vague idea about levels and continuums of participation, and due to the scientific approach to PTD. The author thus recommends integrating a professional social scientist in the Indian FiBL/ bioRe PTD-research team in order to ensure the careful and skilled realization of participatory research as well as for further capacity building processes and supervision of participatory practice in the research region. The author is well aware about the fact that it is tempting to assume that participatory tools are easy to apply but the less experienced the facilitators are the higher is the risk of malfunctions of participation. At FiBL capacity building is therefore also a crucial aspect for farmers' stimulation of motivation for participation. Particularly the key function of biore agricultural extension workers as participation facilitators and multipliers should be acknowledged more. Thus they should be integrated more systematically and more actively into the research process.

Moreover, doing participatory research demands from scientists to rethink their role as scientists, to rethink the relation between research subjects and research objects, if not even to dissolve the boundaries between them: participatory research means *facilitating* research of lay researchers. Besides, at doing participatory research there should be a clear definition about the forms and the level of participation that FiBL aims at. If one takes participation seriously any participatory activity should more or less aim at the transfer of decisive power to the local people, i.e. to transfer decision making and ownership as well as to transfer control over the on-farm component of the PTD-research project to bioRe

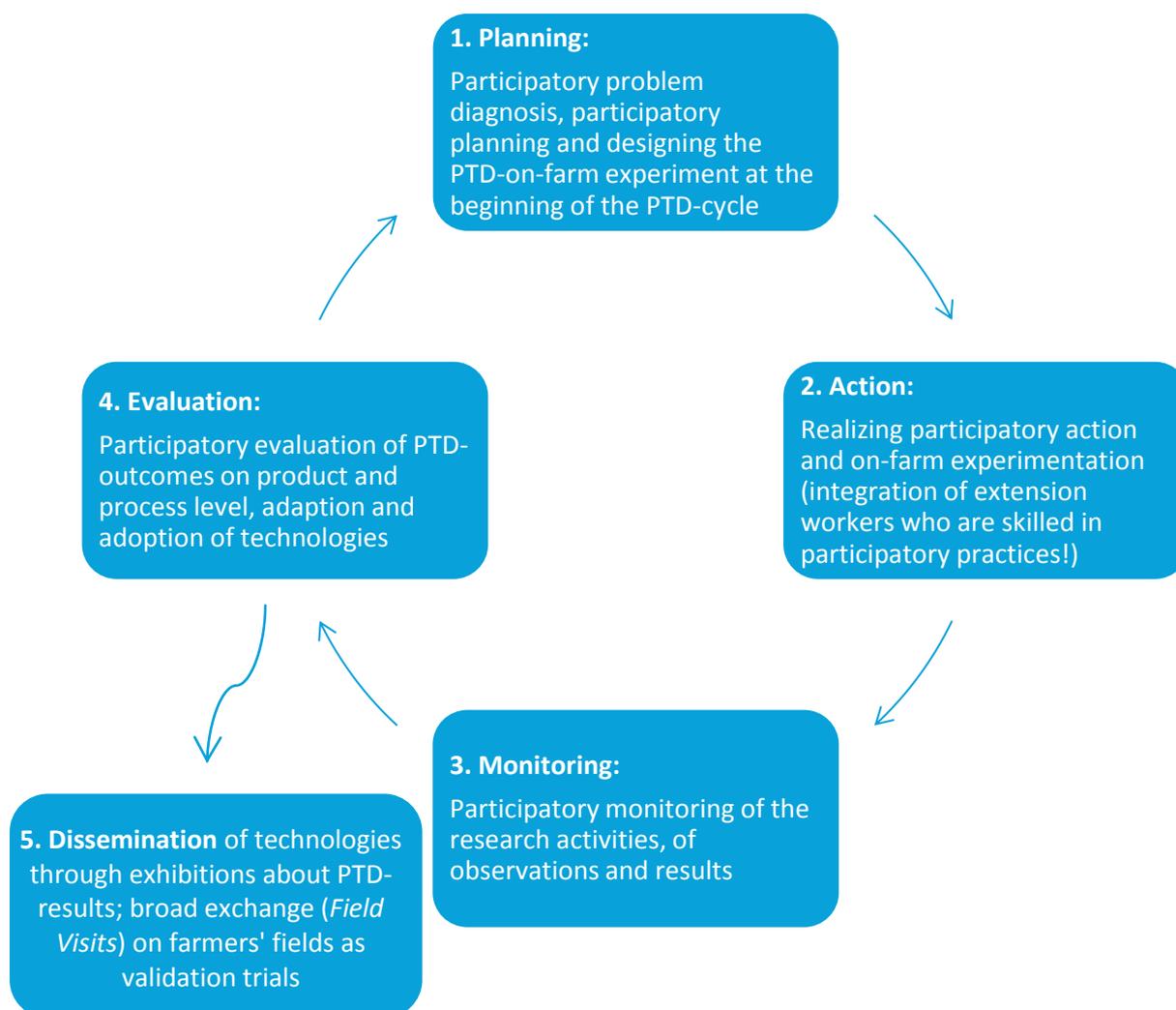
farmers. Consequently, empowerment through PTD should not be restricted on empowerment for technology generation and the increase of motivation degrees for the participation in the PTD-project for technology generation purposes. From this follows the recommendation of focusing FiBL's attention to equal shares on the question *How much are bioRe farmers motivated?* and on the question *For what are they motivated?* There cannot be recommended single tools which automatically lead to increased motivation degrees. The motivation types of participating bioRe PTD-farmers are much too diverse for that.

Nevertheless, some very basic recommendations that refer to the appropriate selection of tools can still be made. Informal observations during the *test workshops* revealed that the extensionists' recommended not conducting a *Flow Diagram*¹⁷³ with farmers in order to avoid an overcharge. This attitude indicates an underestimation of farmers' capacities from extensionists' side that might extend to members of the FiBL/ bioRe research staff. Yet, from practice, it can be reported that especially the most advanced PTD-farmers frequently felt methodologically unchallenged. Thus, the application of more demanding tools in the group of investigation is assumed to have positive effects on the participation degree. Besides, the possible underestimation of farmers can be taken as evidence for their poor recognition as agricultural experts who also possess broad knowledge, comprehension of complex structures, and abstract imaginative power. FiBL is recommended to reassure whether farmers' expertise is acknowledged at least among the research staff, and if not FiBL should improve a possible unequal relationship between researchers and farmers in order to create a positive atmosphere of participation. In the end, this also facilitates long-term pro-active engagement of all persons involved.

Additionally, FiBL also wanted to know how bioRe farmers' ideas can be integrated more systematically into the whole PTD-research process. First of all, as a matter of fact FiBL's program to organize farmer meetings and to conduct group discussion in the context of the participatory component of the *Long-Term Farming Systems Comparison Experiment* (LTE) is vague and immature. Hence, for the consolidation of project participation and for the workable integration of PTD-results for scientific publications participatory components should be integrated in the PTD-project cycle according to each project phase:

¹⁷³ *Flow Diagrams* are used to visualize activities, processes or inputs and outcomes in order to describe stepwise solution of a problem, workflows, or movements, etc. This kind of diagram can become very complex while demanding abstract imaginative power. Hence, it can be considered as a very advanced participatory tool that needs a skilled facilitator.

Figure 71: Project participation in the FiBL/ bioRe PTD-project



Source: ZAHUMENSKY 2013

At the time of the case study in 2010 *Participatory Monitoring & Evaluation* (PM&E)¹⁷⁴ was still not integrated in the PTD-research cycle, and the documentation of results by farmers was at the very beginning. Since farmers have difficulties with the independent documentation of PTD-results and observations the realization of PM&E workshops is very recommendable. Besides, PM&E trains the critical observation and analyzing skills of farmers what is undeniably beneficial for the experimentation with agricultural techniques/ technologies.

¹⁷⁴ "Participatory monitoring & evaluation (PM&E) is a process through which stakeholders at various levels engage in monitoring or evaluating a particular project, program or policy, share control over the content, the process and the results of the M&E activity and engage in taking or identifying corrective actions. PM&E focuses on the active engagement of primary stakeholders. (WORLD BANK 2013e)

With regard to dissemination of technologies more attention should be focused on the presentation of results to a broad public outside the PTD-participating farmers group since this will have positive motivational effects on the PTD-farmers especially with regard to the basic motivation facet *Pride in Productivity*. The demonstration of PTD-benefits can take place through PTD-exhibitions on the bioRe farm or on farmers' fields where voluntary exchange can take place.

Another important recommendation is that the above participatory components of each project phase should be institutionalized, i.e. they ought to be realized in frequent and in fixed intervals:

1. An initial *participatory* diagnosis
2. A mid-term *participatory* M&E
3. A final *participatory* evaluation

There are several tools for PM&E such as *Impact Analysis Report* (IAR) or the *Most Significant Change* (MSC) technique and many other tools that can be developed or adjusted according to local questions and conditions. Again, the consultation of a skilled on-site social scientist is recommendable in order to institutionalize participation in form of PM&E, too.

In addition, for reliability purposes a general and binding PTD-project plan should be developed by FiBL in cooperation with the bioRe research staff and under consultation of bioRe PTD-farmers. Ideally, such a project plan that involves fixed participatory components should be developed in a participatory way. This ensures the compliance of duties and rights of all persons involved in the participatory research process.

All of these recommendations principally refer to FiBL's *Participatory Technology Development* (PTD) at the Indian *Long-Term Farming Systems Comparison Experiment* (LTE) project site. Nevertheless, they can also be applicable for the LTE sites in Kenya or Bolivia. The results at the other LTE sites are suggested to be compared with results of the Indian PTD in order to optimize the entire participatory research processes at FiBL. Therefore the participatory processes in the context of the Kenyan and Bolivian PTD sites are also suggested to be scrutinized. Gathering more information about features of participation of local farmers at different sites will contribute to mutual learning and is supposed to create the basis for sustained beneficial outcomes on process and product level.

8.3 Scientific recommendations

From a scientific perspective there can be made recommendations about further investigations. Particularly the debatable premises of the case study should be surveyed in more detail. There is a need for the statistical evidence about the correlation between participatory tools and changes of motivation degrees. Moreover, the development of appropriate measuring tools for the assessment of impacts of participatory tools on

individual level is required. Likewise, there is a lack of statistical evidence about the power of participatory tools to directly influencing motivation degrees of individuals who experienced participatory tools. Additionally, it is still to be proven whether participatory tools can influence motivation degrees in a targeted way.

In general, topics of motivational psychology should be integrated more systematically into investigations about participatory methods. Actually, motivation psychology is of high relevance for the stimulation of participation in development or participatory research contexts. Yet, in participatory practice individual psychological aspects seem to be notoriously disregarded. Last but not least, knowing more about the sources of individual's motivation reveals possible locations of motivation for participation as well as it contributes to the development of adequate modes of stimulation of the motivation for proactive and sustainable participation. This would in the long run improve ways of socio-cultural and techno-scientific empowerment, the demand for participation from intrinsic motivation, and the endogenous problem-solving capacities of disadvantaged people through *Participatory Technology Development* (PTD).

9. Conclusion

During the last chapter participatory research was equalized with development practice because both are interventions. It is a misconception that motivation for participation can be stimulated free from external influence. Scientific approaches that combine research with development objectives such as PTD indeed represent ways of realizing participatory principles in the most objective way as possible. In addition, there is no other sphere where 'open asking' is inherent to the procedure to such an extent. Therefore PTD entails great power for the inducement of social change, for empowerment, and for sustained independent problem-solving.

The evaluation of participatory tools during the case study gave evidence to the direct and immediate effects on participants of participatory workshops in the context of PTD. Hence, albeit entailing great potential this stimulating power remains nebulous. It is disturbing to know that participatory methodology is commonly applied although we lack knowledge about the features and modes of action of participatory tools with respect to individual's behavioral patterns.

The present case study about PTD in rural India shall contribute to the eradication of this weakness through the delivery of data about individual's basic motivation and motivation for participation related to the application of participatory tools. Moreover, starting points for further necessary research were suggested. In addition, the blueprint of a measuring tool was developed, tested, and analyzed. This tool represents an improvable but creative way of linking a variety of subjects for the purpose of knowledge acquisition - one of the major objectives of (development) geography.

The final conclusion of this case study is that if PTD in the research region and anywhere else in the world aims at the stimulation of local people's motivation for project participation as well as for participation on a broader socio-political level, practitioners still have to internalize that the power of knowledge acquisition and knowledge processing has to be transferred to local people though the transmission of decisive power where and whenever possible. This includes to hand over the reins of power and to share control over participatory research activities that, in addition, should be continuously reflected and negotiated between practitioners and participants. Women are all too often disregarded as agricultural workers and decision makers and should by all means be integrated in PTD processes in order to render PTD a really self-sustained process for the benefit of *all* persons involved.

10. BIBLIOGRAPHY

- ATKINSON, J. (1964): An introduction to motivation. Princeton, New York: Van Nostrand.
- AVILA, M. (1987): Strategies for farming systems research. In: J. KATEGILE; A. SAID & B. DZOWELA (Eds.): Animal Feed Resources for Small-Scale Livestock Producers. Proceedings of the second Pastures Network for Eastern and Southern Africa (PANESA) workshop held in Nairobi. Ottawa: International Development Research Centre (IDRC), pp. 239-255.
- BEHERA, U. & A. SHARMA (2008): Modern Concepts of Agriculture: Farming Systems. New Delhi: Indian Agricultural Research Institute.
- BEHRENDT, R. F. (1971): Die Zukunft der Entwicklungsländer als Problem des Spätmarxismus. In: BOHNET, M. (Ed.): Das Nord-Süd-Problem. Konflikte zwischen Industrie- und Entwicklungsländern, pp. 86-101.
- BEHRENDT, R. F. (1971): Lob des Westens. Zürich.
- BESSETTE, G. (2005): Participatory Development Communication: Reinforcing the Participatory NRM Research and Action Process. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 94-103.
- BIGGS, S. D. (1989): Resource-poor farmer participation in research: a synthesis of experiences from nine national agricultural research systems. OFCOR comparative study paper, no. 3. The Hague: International Service for National Agricultural Research.
- BIORE ASSOCIATION (2013a): BioRe Association Brochure Jan2012.
http://bioreassociation.org/pdf/bioRe_Association_Brochure_Jan2012.pdf
- BIORE ASSOCIATION (2013b): Profile: bioRe FiBL Research.
<http://bioreassociation.org/profile.html>, accessed 01/25/2013
- BIORE INDIA LTD. (2012): Home.
<http://www.bioreindia.com/Index.aspx>, accessed 01/25/2013
- BLAIKIE, P. (1985): The political economy of soil erosion in developing countries. London: Longman.
- BLAIKIE, P. (1995): Changing environments or changing views? A political ecology for developing countries. *Geography*, 80(3), pp. 203-214.
- BUNDESMINISTERIUM FÜR WIRTSCHAFTLICHE ZUSAMMENARBEIT UND ENTWICKLUNG (BMZ) (2010): Bundesregierung hält an 0,7-Prozent ODA-Ziel fest.
http://www.bmz.de/de/presse/aktuelleMeldungen/2010/maerz/pm_20100308_40.html, accessed 07/04/2012
- BUNDESMINISTERIUM FÜR WIRTSCHAFTLICHE ZUSAMMENARBEIT UND ENTWICKLUNG (BMZ) (2010-2012): Lexikon der Entwicklungspolitik: Partizipation.
<http://www.bmz.de/de/service/glossar/P/partizipation.html>, accessed 05/13/2012

- BOHLE, H. G.; DOWNING, T. E. & M. J. WATTS (1994): Climate change and social vulnerability: the sociology and geography of food insecurity. *Global Environmental Change*, 4, pp. 37-48.
- BOHNSACK, R.; MAROTZKI, W. & M. MEUSER (Eds.) (2006): *Hauptbegriffe Qualitativer Sozialforschung* (2nd ed.). Opladen, Farmington Hill: Budrich.
- BOOTH, D. (1985): Marxism and Development Sociology: Interpreting the Impasse. *World Development*, 13, pp. 761-787.
- BREITBART, M. M. (2010): Participatory Research Methods. In: CLIFFORD, N. & S. V. FRENCH (Eds.): *Key Methods in Geography* (2nd ed.). London [a.o.]: Sage.
- BRENDEL, C. (2002): Partizipation und partizipative Methoden in der Arbeit des DED. Ein Orientierungsrahmen aus der Praxis für die Praxis. Bonn.
- BRUNDTLAND, G. H. (Ed.) (1987): *Our Common Future: [Brundtland-Report] Report of World Commission on Environment and Development*. Oxford [a.o.]: Oxford University Press.
- CENTRE FOR DEVELOPMENT INNOVATION (CDI): (2004-2010). Theories & Backgrounds: PPM&E in projects and programs.
http://portals.wi.wur.nl/ppme/?PPM%26E_in_projects_and_programs, accessed 08/06/2012
- CENTRAL RESEARCH INSTITUTE FOR DRYLAND AGRICULTURE (CRIDA) (2012): Agriculture Contingency Plan: Khargone (West Nimar) District.
<http://www.crida.in/CP-2012/statewiseplans/madhya%20pradesh/MP10-Khargone-26.6.2012.pdf>
- CHAMBERS, R. (1983): *Rural Development: Putting the Last First*. London: Longman.
- CHAMBERS, R. (1992): *Rural Appraisal: Rapid, Relaxed, and Participatory*. IDS Discussion Paper, 311. Institute of Development Studies, University of Sussex.
- CHAMBERS, R. (1997): *Whose Reality Counts? Putting the First Last*. London: IT Publications.
- CHAMBERS, R. (2008): *Revolutions in Development Inquiry*. London, Sterling: Earthscan.
- CHAMBERS, R. (2011): PRA, PLA and Pluralism: Practice and Theory. In: REASON, P. & H. BRADBURY (Eds.): *The SAGE Handbook of Action Research. Participative Inquiry and Practice* (2nd reprinted ed.). London [a.o.]: Sage.
- CLEAVER, F. (2004): Institutions, Agency and Limitations of Participatory Approaches to Development. In: COOKE, B. & U. KOTHARI (Eds.): *Participation. The New Tyranny?* London, New York: Zed books, pp. 36-55.
- COOKE, B. & U. KOTHARI (Eds.) (2004): *Participation. The New Tyranny?* (3rd ed.). London, New York: Zed Books.
- COOKE, B. (2004): The Social Psychological Limits of Participation? In: COOKE, B. & U. KOTHARI (Eds.): *Participation. The New Tyranny?* (3rd ed.). London, New York: Zed Books, pp. 102-121.

- COY, M. (2000): Aufgaben der Geographie für Entwicklungsländerforschung und Entwicklungspolitik. In: BLOTEVOGEL, H.; OSSENBRÜGGE, J. & G. WOOD, (Eds.): Lokal verankert - weltweit vernetzt. Tagungsbericht und wissenschaftliche Abhandlungen [52. Deutscher Geographentag Hamburg, 2. - 9. Oktober 1999], pp. 46-58.
- CRAMB, R. (2005): Rethinking the Development, Dissemination and Adoption of Agricultural Technologies. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 145-150.
- DEPARTMENT FOR INTERNATIONAL DEVELOPMENT (DFID) (1999): Sustainable Livelihoods guidance sheets. London: DFID
- DRÈZE, J. & A. SEN (2002): India: Development and Participation (2nd ed.). Oxford: Oxford University Press.
- DURGADAS, R. (2010): People's Participation in Rural Development in India. Rhetoric and Reality. Kolkata: Gangchil.
- ESCOBAR, A. (1995): Encountering Development: The Making and Unmaking of the Third World. Princeton, New York: Princeton University Press.
- ESCOBAR, A. (1997): The Making and Unmaking of the Third World through Development. In: RAHNEMA, M. & V. BAWTREE (Eds.): The Post-Development Reader. Zed books, London, New Jersey.
- ESCOBAR, A. (2005): El "postdesarrollo" como concepto y práctica social. In: MATO, D. (Ed.): Políticas de economía, ambiente y sociedad en tiempos de la globalización. Caracas: Facultad de Ciencias Económicas y Sociales, Universidad Central de Venezuela, pp. 17-31.
- ESCOBAR, A. (2007): 'Post-development' as concept and social practice. In: ZIAI, A. (Ed.): Exploring Post-development. Theory and practice, problems and perspectives. London, New York: Routledge, pp. 18-31.
- ESTEVA, G. (1992/ 2010): Development. In: SACHS, W. (Ed.): The Development Dictionary. A Guide to Knowledge as Power (2nd ed.), London, New York: Zed Books.
- ESTEVA, G. (1993): Entwicklung. In: SACHS, W. (Ed.): Wie im Westen so auf Erden. Ein polemischer Handbuch zur Entwicklungspolitik. Rheinbeck bei Hamburg: Rohwolt, pp. 89-121.
- EUROPEAN TRADE UNION INSTITUTE (ETUI) (2013): Gateway to Information on Worker Participation Issues in Europe: National Industrial Relations: Across Europe: Trade Unions.
<http://www.worker-participation.eu/National-Industrial-Relations/Across-Europe/Trade-Unions2>, accessed 11/29/2012
- EVERS, H.-D. (1988): Subsistenzproduktion, Markt und Staat: der sog. Bielefelder Verflechtungsansatz. In: LENG, G. & W. TAUBMANN (Eds.): Geographische

- Entwicklungsforschung im interdisziplinären Dialog. 10 Jahre 'Geographischer Arbeitskreis Entwicklungstheorien', pp. 131-143.
- EYHORN, F. (2006): Assessing the potential of organic farming for sustainable livelihoods in developing countries. The case of cotton in India. Inauguraldissertation der Philosophisch-naturwissenschaftlichen Fakultät der Universität Bern.
- FOOD AND AGRICULTURE ORGANIZATION (FAO) (2013): Home: About FAO: Who we are: Departments: Natural Resources and Environment: Land Resources, Management, Planning and Use: Sustainable Land Management: Farmer Field School. <http://www.fao.org/nr/land/sustainable-land-management/farmer-field-school/en/>, accessed 09/18/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2011a): Farming Systems Comparison in the Tropics: Home: Project Sites: Project Activities in India, Kenya and Bolivia. <http://www.systems-comparison.fibl.org/en/scp-project-activities.html>, accessed 08/30/2012
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2011b): Farming Systems Comparison in the Tropics: Home: About: History. <http://www.systems-comparison.fibl.org/en/scp-system-comparisons/scp-history.html>, accessed 01/25/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2013a): Farming Systems Comparison in the Tropics: Project Sites: India: Site Description. <http://www.systems-comparison.fibl.org/en/scp-project-activities/scp-india/scp-indiasite.html>, accessed 05/01/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2013b): Farmings Systems Comparison in the Tropics: Home: Project Coordination: Partners. <http://www.systems-comparison.fibl.org/en/scp-projectcoordination/scp-partners.html>, accessed 04/30/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2013c): Farming Systems Comparison in the Tropics: Home: About: Participatory Technology Development (PTD). <http://www.systems-comparison.fibl.org/en/scp-systems-comparison/scp-ptd.html>, accessed 05/01/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2013d): Farming Systems Comparison in the Tropics: Home: Project Sites: India: Participatory Technology Development: Participatory Technology Development (PTE) India. <http://www.systems-comparison.fibl.org/en/scp-project-activities/scp-india/scp-india-ptd-en.html>, accessed 05/2/2013
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL) (2013e): Treatment details for the PTD mother trials on phosphate rock application improvement in India. http://www.systems-comparison.fibl.org/fileadmin/images/subdomains/syscom/Tables_Charts_Etc/table_ind_ptd_treatments_1.gif, accessed 01/25/2013

- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANBAU (FiBL)/ INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE (IFOAM) (2004): The World of Organic Agriculture. Statistics and Emerging Trends 2004. <http://orgprints.org/2555/1/willer-yussefi-2004-world-of-organic.pdf>
- FORSCHUNGSINSTITUT FÜR BIOLOGISCHEN LANDBAU (FiBL)/ INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE (IFOAM) (2013): The World of Organic Agriculture. Statistics and Emerging Trends 2013. <http://www.organic-world.net/fileadmin/documents/yearbook/2013/web-fibl-ifoam-2013-318-321.pdf>
- FREIRE, P. (1970): Pedagogy of the oppressed. New York: Herder and Herder.
- FREIRE, P. (1998): Pedagogy of freedom: ethics, democracy, and civic courage. Lanham [a.o.]: Rowman & Littlefield.
- GOVERNMENT OF INDIA (2010-11): Census of India: Home: 2011 Census Data: Houselisting and Housing Data: Houselisting and Housing Census Data Highlights: Madhya Pradesh: 6. All Indicators. http://www.censusindia.gov.in/2011census/hlo/Data_sheet/MP/All_indicator.pdf
- GOVERNMENT OF INDIA (2011a): Census of India 2011: Provisional Population Totals, Paper 2. http://www.censusindia.gov.in/2011-prov-results/paper2/data_files/mp/6-fig-india-vi.pdf
- GOVERNMENT OF INDIA (2011b): Census of India 2011: Provisional Population Totals, Paper 2: Literates by residence - Persons. http://www.censusindia.gov.in/2011-prov-results/paper2/data_files/india/paper2_3.pdf
- GOVERNMENT OF INDIA (2011c): Madhya Pradesh Population Census data 2011. <http://www.census2011.co.in/census/state/madhya+pradesh.html>, accessed 11/27/2012
- GOVERNMENT OF INDIA (2011d): West Nimar (Khargone) District : Census 2011 data. <http://www.census2011.co.in/census/district/307-west-nimar.html>, accessed 11/27/2012
- GOVERNMENT OF INDIA (2011e): Census of India 2011: Provisional Population Totals, Paper 1: Chapter 6: State of Literacy. http://www.censusindia.gov.in/2011-prov-results/data_files/india/Final_PPT_2011_chapter6.pdf
- GOVERNMENT OF INDIA (2011f): Census of India 2011: Provisional Population Totals, Paper 2, Volume 2 of 2011: Rural-Urban Distribution, Madhya Pradesh. http://www.censusindia.gov.in/2011-prov-results/data_files/mp/04population.pdf%2050%20No23.4.pdf
- GOVERNMENT OF INDIA (2011g): Census of India 2011: Provisional Population Totals, Paper 2, Volume 2 of 2011, Series 24: Rural-Urban Distribution, Madhya Pradesh. http://www.censusindia.gov.in/2011-prov-results/data_files/mp/09Annexure-State%20tables.pdf
- GOVERNMENT OF INDIA (2011h): Census of India 2011: Provisional Population Totals, Paper 2,

- Vol. 1: Rural-Urban Distribution. http://www.censusindia.gov.in/2011-prov-results/paper2/data_files/india/paper2_1.pdf
- GOVERNMENT OF INDIA (2011i): At a Glance: Previous At a Glance: Agricultural Statistics At a Glance 2011. http://eands.dacnet.nic.in/latest_20011.htm, accessed 09/12/2012
- GOVERNMENT OF INDIA (2011-12): State of Indian Agriculture 2011-12. <http://agricoop.nic.in/SIA111213312.pdf>
- GOVERNMENT OF INDIA (2012): Agriculture Census 2010-11. <http://agcensus.nic.in/document/agcensus2010/agcen2010rep.htm>, accessed 12/5/2012
- GOVERNMENT OF INDIA (2012-13): Annual Report of the Department of Agriculture & Cooperation 2012-13. <http://agricoop.nic.in/Annual%20report2011-12/ARE.pdf>
- GOVERNMENT OF INDIA (2013): India at a glance. <http://www.india.gov.in/india-glance/profile>, accessed 03/27/2013
- GOVERNMENT OF MADHYA PRADESH (2009-10): Compendium of Agriculture Statistics 2009-10, Madhya Pradesh. http://mpkrishi.org/krishinet/Compendium/Comp_Page1to56.pdf
- GOVERNMENT OF MADHYA PRADESH (2004a): Department of Farmer Welfare & Agriculture Development: About us: Overview: MP Agriculture. <http://www.mpkrishi.org/AgriOverview.aspx>, accessed 09/12/2012
- GOVERNMENT OF MADHYA PRADESH (2004b): Department of Farmer Welfare and Agriculture Development: Agri Statistics: State's Share in National Agriculture Production and their status 2001-02: State's Share in National Agriculture Production and their Status 2001-02. <http://www.mpkrishi.org/statshare02%28statitics%29.aspx>, accessed 09/12/2012
- GRAHAM, S. & B. WEINER (1996): Theories and Principles of Motivation. In: BERLINER, D. & R. CALFEE (Eds.): Handbook of Educational Psychology. New York [a.o.]: Simon & Schuster Macmillan.
- GESELLSCHAFT FÜR TECHNISCHE ZUSAMMENARBEIT (GTZ) (1983): Ländliche Regionalentwicklung - Ein Orientierungsrahmen (Vol. Schriftenreihe der GTZ 128). Eschborn.
- GUIJT, I. & M. K. SHAH (1998): The Myth of Community: Gender Issues in Participatory Development. London: IT Publications.
- HAILEY, J. (2004): Beyond the Formulaic: Process and Practice in South Asian NGOs. In: COOKE, B. & U. KOTHARI (Eds.): Participation. The New Tyranny? London, New York: Zed Books, pp. 88-101.
- HARDWICK, S. W. (2009): Case Study Approach. In: KITCHIN, R. & N. THRIFT (Eds.): International Encyclopedia of Human Geography, 1, pp. 441-445.
- HAVERKORT, B. (1996): Farmers' Experiments and Participatory Technology Development. In: HAVERKORT, B.; VAN DE KAMP, J. & A. WATERS-BAYER (Eds.): Joining Farmers' Experiments (repr. ed.). London: Intermediate Technology Publications. London: Intermediate Technology Development.

- HAVERTKORT, B.; VAN DE KAMP, J. & A. WATERS-BAYER (1996): *Joining Farmers' Experiments* (repr. ed.). London: Intermediate Technology Publications.
- HECKHAUSEN, H. (1989): *Motivation und Handeln* (2nd, completely revised and expanded ed.). Berlin, Heidelberg [a.o.]: Springer.
- HICKEY, S. & U. KOTHARI (2009): Participation. In: KITCHIN, R. & N. THRIFT (Eds.): *International Encyclopedia of Human Geography*, 8, pp. 82-89.
- HICKEY, S. & G. MOHAN (2004): Towards participation as transformation: critical themes and challenges. In: HICKEY, S. & G. MOHAN (Eds.): *Participation: From Tyranny to Transformation? Exploring New Approaches to Participation in Development*. New York: Zed books, pp. 3-24.
- HILDYARD, N.; HEGDE, P.; WOLVEKAMP, P. & S. REDDY (2004): Pluralism, Participation and Power: Joint Forest Management in India. In: COOKE, B. & U. KOTHARI (Eds.): *Participation: The New Tyranny?* (3rd ed.). London, New York: Zed Books.
- HORNE, P. & W. STÜR (1998): Participatory approaches to agricultural technology development in sloping lands (Vol. Extension bulletin 462). Taipei City, CN: Food and Fertilizer Technology Center (FFTC).
- HORNE, P. & W. STÜR (2005): Developing Agricultural Solutions with Smallholder Farmers: How to Get Started with Participatory Approaches. In: GONSALVES, J. et al. (Eds.): *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook*. Laguna, Ottawa, pp. 172-180.
- INDIAN COUNCIL OF AGRICULTURAL RESERACH (ICAR) (1996). India - Agro-Ecological Subregions. http://eusoils.jrc.ec.europa.eu/esdb_archive/eudasm/asia/images/maps/download/in2011_cl.jpg, accessed 09/07/2012
- INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (IIED) (Ed.) (1995): *PLA Notes*. 24, Special issue on 'Critical Reflections from Practice. London: Sustainable Agriculture Programme, IIED.
- INTERNATIONAL MONETARY FUND (IMF); INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA), & WORLD BANK (1999): *Poverty Reduction Strategy Papers - Operational Issues*. Washington, D.C.: World Bank.
- KANJI, N. & L. GREENWOOD (2001): Participatory approaches to reserach and development in IIED: Learning from experience . London: International Institute for Environment and Development (IIED).
- KESBY, M.; KINDON, S. & R. PAIN (2009): Participation as a form of power. Rethorising empowerment and spatialising Participatory Action Research. In: KINDON, S.; PAIN, R. & M. KESBY (Eds.): *Participatory Action Research Approaches and Methods. Connecting people, participation and place*. London [a.o.]: Routledge, pp. 19-25.
- KIELY, R. (1995): *Sociology and Development. The Impasse and Beyond*. London.
- KIELY, R. (1998): The Crisis in Global Development. In KIELY, R. & P. MARFLEET (Eds.): *Globalisation and the Third World*, pp. 23-43.

- KINDON, S.; PAIN, R. & M. KESBY (2009): Participatory Action Research. Origins, approaches and methods. In: KINDON, S.; PAIN, R. & M. KESBY (Eds.): Participatory Action Research Approaches and Methods. Connecting people, participation and place. London, New York: Routledge.
- KLÜVER, J. & H. KRÜGER (1972): Aktionsforschung und soziologische Theorien. In: HAAG, F. (Ed.): Aktionsforschung: Forschungsstrategien, Forschungsfelder und Forschungspläne. München: Juventa.
- KRAMER, D.; KRAMER, H. & S. LEHMANN (1979): Aktionsforschung: Sozialforschung und gesellschaftliche Wirklichkeit. In: HORN, K. (Ed.): Aktionsforschung: Balanceakt ohne Netz? Methodische Kommentare. Frankfurt a. M.: Syndikat Autoren- und Verlagsgesellschaft, pp. 21-40.
- KRECZI, F. (2011): Vulnerabilities in the Eastern Pamirs. Berlin Geographical Papers (39). Berlin: Centre for Development Studies (ZELF), Institute of Geographical Sciences, Freie Universität Berlin.
- KROMREY, H. (2006): Empirische Sozialforschung. Modelle und Methoden der standardisierten Datenerhebung und Datenauswertung (11th revised ed.). Stuttgart: Lucius & Lucius.
- KUHN, B. (1998): Participatory development in rural India. New Delhi: Radiant.
- LAMNEK, S. (2005): Qualitative Sozialforschung: Lehrbuch (4th revised ed.). Weinheim [a.o.]: Beltz.
- LATOUCHE, S. (1993): In the Wake of the Affluent Society: An Exploration of Post-development. London: Zed Books.
- LEWIN, K. (1936): Principles of topological Psychology. New York: McGraw-Hill.
- LEWIN, K. (1953): Die Lösung sozialer Konflikte: ausgewählte Abhandlungen über Gruppendynamik. Bad Nauheim: Christian.
- LEWIN, K. (1963): Feldtheorie in den Sozialwissenschaften: ausgewählte theoretische Schriften. Bern, Stuttgart: Huber.
- LIMB, M. & C. DWYER (Eds.) (2001): Qualitative Methodologies for Geographers. Issues and Debates. London: Arnold/ Hodder.
- LINQUIST, B.; KEBOU ALPHA, B. H. & C. LAI (2005): Upland Research in Lao PDR: Experiences with Participatory Research Approaches. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook PR+D (Vol. 3: Doing PR+D). Laguna, Ottawa, pp. 58-65.
- MÄDER, P.; FLIESSBACH, A.; DUBOIS, D.; GUNST, L.; FRIED, P. & U. NIGGLI (2002): Soil Fertility and Biodiversity in Organic Farming. Science, pp. 1694-1697.
- MAYRING, P. (2002): Einführung in die Qualitative Sozialforschung. Eine Anleitung zu qualitativem Denken. 5. überarbeitete und neu ausgestattete Auflage. Weinheim und Basel: Beltz.
- MC CLELLAND, D. (1961): The Achieving Society. Princeton, NJ [u.a.]: Van Nostrand.

- MC KINNON, K. (2007): Postdevelopment, Professionalism, and the Politics of Participation. *Annals of the Association of American Geographers*, 97(4), pp. 772-785.
- MEADOWS, D. M. (1972): *The Limits to Growth* (3. pr. ed.). New York: Universe Books.
- MENZEL, U. (1991): *Geschichte der Entwicklungstheorie*. Hamburg: Deutsches Übersee-Institut.
- MENZEL, U. (1992): *Das Ende der Dritten Welt und das Scheitern der großen Theorie*. Frankfurt/ M.: Suhrkamp.
- MENZEL, U. (2010): *Entwicklungstheorie*. In: STOCKMANN, R.; MENZEL, U. & F. NUSCHELER (Eds.): *Entwicklungspolitik. Theorien - Probleme - Strategien*. München: Oldenbourg.
- MOHAN, G. (2008): *Participatory development*. In: DESAI, V. & R. POTTER (Eds.): *The Companion to Development Studies* (2nd ed.). London: Hodder Education, pp. 45-50.
- MOOSBRUGGER, H. & A. KELAVA (Eds.) (2012): *Testtheorie und Fragebogenkonstruktion* (2nd updated and revised ed.). Berlin, Heidelberg: Springer.
- MOSER, H. (1975): *Aktionsforschung als kritische Theorie der Sozialwissenschaften*. München: Kösel.
- MOSSE, D. (1994): *Authority, Gender and Knowledge: Theoretical Reflections on the Practice of Participatory Rural Appraisal*. *Development and Change*, 25, pp. 497-526.
- MOSSE, D. (2004): 'People's Knowledge', Participation and Patronage: Operations and Representations in Rural Development. In: COOKE, B. & U. KOTHARI (Eds.): *Participation: The New Tyranny?*. London, New York: Zed Books, pp. 16-35.
- MURRAY, H. (1938): *Explorations in personality*. New York: Oxford University Press.
- NAG, P. (Ed.) (2001): *Socio-economic Atlas of India* (1st ed.). Kolkata: National Atlas and Thematic Mapping Organisation.
- NAG, P. (Ed.) (2002): *National Atlas of India* (1st, abridged ed.). Kolkata: National Atlas and Thematic Mapping Organisation.
- NARAYAN, D. (1996): *Toward Participatory Research*. World Bank Technical Paper, no. 307. Washington: World Bank.
- NATIONAL FAMILY HEALTH SURVEY (NFHS-3) 2005-06, India, Volume 1
http://pdf.usaid.gov/pdf_docs/PNADK385.pdf
- NEDERVEEN PIETERSE, J. (2000): *After post-development*. In: *Third World Quarterly*, 21(2), pp. 175–191.
- NEDERVEEN PIETERSE, J. (2009): *Postdevelopment*. In: KITCHEN, R. & N. THRIFT (Eds.): *International Encyclopedia of Human Geography*, 8, pp. 339-343.
- NEEF, A. (2003): *Participatory approaches under scrutiny: will they have a future?* In: *Quarterly Journal of International Agriculture*, 42(4), pp. 493-501.
- NEEF, A. & D. NEUBERT (2004): *Assessing Participation in agricultural research projects: An analytical framework*. Institute of Agricultural Economics and Social sciences in the Tropics and Subtropics: Research in Development Economies and Policy. Discussion Paper No. 6/2004. Filderstadt: Grauer.

- NEUBERT, D. (2000): A new magic term is not enough. Participatory approaches in agricultural research. In: *Quarterly Journal of International Agriculture*, 39(1), pp. 25-50.
- NIGHTINGALE, A. (2009): Triangulation. In: KITCHIN, R. & N. THRIFT (Eds.): *International Encyclopedia of Human Geography*, 11, pp. 489-492.
- NOHLEN, D. & F. NUSCHELER (1993): *Handbuch Dritte Welt*.
- NOHLEN, D. (Ed.). (2000): *Lexikon Dritte Welt. Länder, Organisationen, Theorien, Begriffe, Personen* (11th, compl. revised ed.). Reinbeck bei Hamburg: Rowohlt.
- NUSCHELER, F. (2006): *Entwicklungspolitik* (Vol. 488). Bonn: Bundeszentrale für politische Bildung, Bpb.
- PAIN, R. (2003): *Social Geography: on action-oriented research*. *Progress in Human Geography*, 5, pp. 649-657.
- PAIN, R. (2004): *Social Geography: participatory research*. *Progress in Human Geography*, 28(5), pp. 652-663.
- PAIN, R.; KINDON, S. & M. KESBY (2009): *Participatory Action Research: making a difference to theory, practice and action*. In: KINDON, S.; PAIN, R. & M. KESBY: *Participatory Action Research Approaches and Methods. Connecting people, participation and place*. London, New York: Routledge.
- PASTAKIA, A.; KOTHARI, B. & V. S. CHAND (2002): *Empowerment of Local Communities through Technology Development*. In: PASTAKIA, A.; KOTHARI, B. & V. S. CHAND (Eds.): *Farmer-led Participatory Research. Cases from Western India*. Books for Change.
- PEARSON, L. B. (1969): *Partners in Development: Report of the Commission on International Development*. New York [a.o.]: Praeger.
- PEET, R. & E. HARTWICK (2009): *Theories of Development. Contentions, Arguments, Alternatives*. (2nd ed.). New York; London: Guilford Press.
- PIERCE COLFER, C. J.; HARTANTO, H.; JUM, C.; MC DOUGALL, C.; PRAHBU, R. & L. YULIANI (2005): *Adaptive Collaborative Management*. In: GONSALVES, J. et al. (Eds.): *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook* (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 241-248.
- PROCTOR, J. D. & D. M. SMITH (Eds.): (1999). *Geography and ethics: journeys in a moral terrain*. London: Routledge.
- RAHNEMA, M. & V. BAWTREE (Eds.). (1997): *The Post-Development Reader*. London: Zed.
- RAHNEMA, M. (1997a): *Introduction*. In: RAHNEMA, M. & V. BAWTREE (Eds.): *The Post-Development Reader*. London, New York: Zed books, pp. ix-xix.
- RAHNEMA, M. (1997b): *Development and the People's Immune System: The Story of Another Variety of AIDS*. In: RAHNEMA, M. & V. BAWTREE (Eds.): *The Post-Development Reader*. London, New York: Zed books, pp. 111-131.

- RAHNEMA, M. (1997c): Towards Post-Development: Searching for Signpoints, a New Language and New Paradigms. In: RAHNEMA, M. & V. BAWTREE (Eds.): The Post-Development Reader. London, New York: Zed books, pp. 377-403.
- RAUCH, T. (1978): Entwicklungsstrategien für die Dritte Welt. Geographische Hochschulmanuskripte, 6, pp. 251-262.
- RAUCH, T. (1981): Das nigerianische Industrialisierungsmuster und seine Implikationen für die Entwicklung peripherer Räume. Ein Beitrag zur Erklärung der Raumstruktur in peripher-kapitalistischen Ökonomien. (Vol. 24). Hamburg: Hamburger Beiträge zur Afrika-Kunde.
- RAUCH, T. (2003): Bessere Rahmenbedingungen allein beseitigen Armut nicht! Eine theoriegeleitete Vier Ebenen-Strategie für entwicklungspolitische Interventionen. Geographica Helvetica. Schweizerische Zeitschrift für Geographie, 58(1), pp. 35-46.
- RAUCH, T. (2009): Entwicklungspolitik. Theorien, Strategien, Instrumente. Braunschweig: Westermann.
- REASON, P. & H. BRADBURY (Eds.) (2011): Handbook of Action Research (2nd, repr. ed.). Los Angeles [a.o.] : Sage.
- REIJNTJES, C.; HAVERKORT, B. & A. WATERS-BAYER (1994): Farming for the future. An introduction to Low-External-Input and Sustainable Agriculture (reprinted ed.). London [a.o.]: Macmillan.
- REJ, C. & A. WATERS-BAYER (2005): Farmer Innovation as Entry Point to Participatory Research and Extension. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 159-164.
- REMEI AG (Ed.) (2012): Geschäftsbericht 2011/2012.
- REUBER, P. & C. PFAFFENBACH (2005): Methoden der empirischen Humangeographie. Beobachtung und Befragung. Braunschweig: Westermann.
- RHEINBERG, F. (2002): Motivation. (4th ed.) Stuttgart: Kohlhammer.
- RHOADES, R. & A. BEBBINGTON (1996): Farmers Experiments. In: HAVERKORT, B.; VAN DE KAMP, J. & A. WATERS-BAYER (Eds.): Joining Farmers' Experiments: Experiences in Participatory Technology Development (repr. ed.). London: Intermediate Technology Publications.
- RIST, G. (1997): The History of Development: From Western Origins to Global Faith. London: Zed Books.
- ROBSON, C. (2011): Real World Research: A Resource for Users of Social Research Methods in Applied Settings (3. ed.). Chichester: Wiley.
- ROST, J. (2004): Testtheorie - Testkonstruktion (2nd fully revised and extended ed.). Bern [a.o.]: Hans Huber.
- ROSTOW, W. W. (1960): The stages of economic growth. A non-communist manifesto.
- ROTHERMUND, K. & A. EDER (2011): Motivation und Emotion. Wiesbaden: VS Verlag.
- RUDOLPH, U. (2009): Motivationspsychologie kompakt. 2nd, compl. revised. ed.. Weinheim,

Basel: Beltz.

- SACHS, W. (1992): The Development Dictionary: A Guide to Knowledge as Power. London: Zed.
- SACHS, W. (Ed.) (2010): The Development Dictionary: A Guide to Knowledge as Power (2nd ed.). London, New York: Zed Books.
- SALAS, M.; JIANCHU, X. & T. TILLMANN (2003): Field Manual Participatory Technology Development (PTD): Linking Indigenous Knowledge and Biodiversity for Sustainable Livelihoods (2nd printed ed.). Kunming: Yunnan Science and Technology Press.
- SAMARANAYAKE, M. R. (1996): Significance of Participatory Approaches in Empowering People for Sustainable Development. In: BASTIAN, S. & N. BASTIAN (Eds.): Assessing Participation. A Debate from South Asia. Delhi: Konark.
- SCHOLZ, F. (2000): Globalisierung versus Fragmentierung. Eine regionalwissenschaftliche Herausforderung? *NORD-SÜD aktuell*, XIV(2), pp. 254-271.
- SCHOLZ, F. (2002): Die Theorie der "fragmentierenden Entwicklung". *Geographische Rundschau*, 54(10), pp. 6-11.
- SCHOLZ, F. (2004): *Geographische Entwicklungsforschung. Methoden und Theorien*. Berlin, Stuttgart: Borntraeger.
- SCHOLZ, F. (2006): *Entwicklungsländer - Entwicklungspolitische Grundlagen und regionale Beispiele*. Braunschweig: Westermann.
- SCHULER, H. & M. PROSCHASKA (2001): *Leistungsmotivationsinventar. Dimensionen berufsbezogener Leistungsorientierung. Manual*. Göttingen [a.o.]: Hogrefe.
- SEGBART, D. (2007): *Partizipatives Monitoring als Instrument zur Umsetzung von Good Local Governance: Eine Aktionsforschung im östlichen Amazonien/ Brasilien* (Schriftenreihe der Tübinger Geographischen Studien, 147). Tübingen: Selbstverlag des Geographischen Instituts der Universität Tübingen.
- SELENER, D. (2005): Definitions, Assumptions, Characteristics and Types of Farmer Participatory Research. In: GONSALVES, J. et al. (Eds.): *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook* (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 5-15.
- SEN, A. (1999): *Development as Freedom*. Oxford [a.o.]: University Press.
- SEN, A. (2000): *Ökonomie für den Menschen: Wege zu Gerechtigkeit und Solidarität in der Marktwirtschaft*. München: Hanser.
- SENGHAAS, D. (1974): Elemente einer Theorie des peripheren Kapitalismus. In: SENGHAAS, D. (Ed.): *Peripherer Kapitalismus. Analysen über Abhängigkeit und Unterentwicklung*, pp. 7-36.
- SENGHAAS, D. (1979): Dissoziation und autozentrierte Entwicklung. Eine Entwicklungspolitische Alternative für die Dritte Welt. In: SENGHAAS, D. (Ed.): *Kapitalistische Weltökonomie. Kontroversen über ihren Ursprung und ihre Entwicklungsdynamik*, pp. 376-412.

- SENGHAAS, D. (1994): *Wohin driftet die Welt?* Frankfurt/M.: Suhrkamp.
- ŞERIF, M. & C. W. ŞERIF (1953): *Groups in harmony and tension. an integration of studies on intergroup relations.* New York: Harper & Row.
- SETHI, H. (Ed.) (2008): *Summary - State of democracy in South Asia: India. A report by the SDSA Team.* New Delhi [a.o.]: Oxford Univ. Press.
- SHASTRI, A. & J. WILSON (Eds.) (2001): *The Post-Colonial States of South Asia: Democracy, Identity, Development and Security.* Richmond: Curzon.
- SHIVA, V. (1988): *Staying Alive: Women, Ecology and Development.* London: Zed.
- SHUURMAN, F. J. (1993): *Beyond the Impasse. New Directions in Development Theory.* London.
- SIDAWAY, J. D. (2007). *Spaces of postdevelopment. Progress in Human Geography, 31(3), pp. 345-361.*
- SIEMIATYCKI, E. (2005): *Post-Development at a Crossroads: Towards a 'Real' Development. Undercurrent, 11(3), pp. 58-61.*
- STANG, F. (2002): *Indien: Geographie, Geschichte, Wirtschaft, Politik.* Darmstadt: Wissenschaftliche Buchgesellschaft.
- STOCKMANN, R.; MENZEL, U. & F. NUSCHELER (2010): *Entwicklungspolitik. Theorien - Probleme - Strategien.* München: Oldenbourg.
- THEIS, J. & H. GRADY (1991): *Participatory Rapid Appraisal for Community Development. A Training Manual Based on Experiences in the Middle East and North Africa.* London: International Institute for Environment and Development (IIED).
- THOMSON, J. & K. SCHOONMAKER FREUDENBERGER (1997): *Crafting institutional arrangements for community forestry. Community forestry field manual 7: forests, trees and people.* Rome: Food and Agriculture Organization of the United Nations.
- TIRTHA, R. (2002): *Geography of India (2nd ed.).* Jaipur, New Delhi: Rawat Publications.
- UNITED NATIONS ORGANISATION (1983): *Process of preparation of the Environmental Perspective to the Year 2000 and Beyond. (General Assembly Resolution 38/161 ed.).*
- UNITED NATIONS ORGANISATION (1992): *Physical Features of India. Map no. 3665.*
<http://www.un.org/Depts/Cartographic/map/profile/india.pdf>
- UNITED NATIONS ORGANISATION (2000): *United Nations Millennium Declaration. UN General Assembly Resolution. RES/55/2. United Nations Organization.*
- UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) (2011): *India Factsheet. Economic and Human Development Indicators.*
http://www.undp.org/content/dam/india/docs/india_factsheet_economic_n_hdi.pdf
- UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) (2013): *Home: The Millennium Development Goals: Eight Goals for 2015.*
http://www.undp.org/content/undp/en/home/mdgoverview/accesses_9/25/2013
- UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) (2011): *Human Development Report 2011. Sustainability and Equity: A Better Future for All.* New York: Palgrave Macmillan.

- UNITED NATIONS ECONOMIC AND SOCIAL COUNCIL (UN-ECOSOC) (2013): Home: About ECOSOC: Hot Topics: Millennium Development Goals and post-2015 Development Agenda. <http://www.un.org/en/ecosoc/about/mdg.shtml>, accessed 9/25/2013
- US ARMY MAP SERVICE (1954): Indore, India. Map NF 43-7, Series U502. <http://www.lib.utexas.edu/maps/ams/india/nf-43-07.jpg>, accessed 09/14/2012
- VAN HECK, B. (2003): Participatory Development: Guidelines on Beneficiary Participation in Agriculture and Rural Development. Rome: Food and Agriculture Organization of the United Nations.
- VAN VELDHUIZEN, L.; WATERS-BAYER, A. & C. WETTASINHA (2005): Participatory Technology Development Where There is No Researcher. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 165-171.
- VEL, J.; VAN VELDHUIZEN, L. & B. PETCH (1996): Beyond the PTD Approach. In: HAVERKORT, B.; VAN DE KAMP, J. & A. WATERS-BAYER (Eds.): Joining Farmers' Experiments (repr. ed.). London: Intermediate Technology Publications.
- VERNOOY, R. (2005): The Quality of Participation: Critical Reflections on Decision Making, Context and Goals. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 32-40.
- WAGNER, U. (1997): Interaktive Sozialforschung. Zur Frage der Wissenschaftlichkeit und Brauchbarkeit der Aktionsforschung. Weinheim: Deutscher Studien Verlag.
- WILDE, M.; BÄTZ, K.; KOVALEVA, A. & D. URHAHNE (2009): Überprüfung einer Kurzskala intrinsischer Motivation (KIM). Testing a short scale of intrinsic motivation. Zeitschrift für Didaktik der Naturwissenschaften, 15, pp. 31-45.
- WILLIS, K. (2005): Theories and Practices of Development. London [a.o.]: Routledge.
- WILLIS, K. & M. KUMAR (2009): Development I. In: KITCHIN, R. & N. THRIFT (Eds.): International Encyclopedia of Human Geography, 11, pp. 111-116.
- WOODLEY, E. (2005): Indigenous Knowledge: A Conceptual Framework and a Case from Solomon Islands. In: GONSALVES, J. et al. (Eds.): Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook (Vol. 1: Understanding PR+D). Laguna, Ottawa, pp. 65-74.
- WORLD BANK (2005): World Development Report 2006: Equity and Development. New York: Oxford University Press.
- WORLD BANK (2011): World Development Report 2012: Gender Equality and Development. Washington, D.C.
- WORLD BANK (2013a): Databank: Featured indicators: Agriculture, value added (% of GDP). <http://data.worldbank.org/indicator/NV.AGR.TOTL.Z>, accessed 12/06/2012

- WORLD BANK (2013b): Databank: Featured indicators: Agricultural land (% of land area). <http://data.worldbank.org/indicator/AG.LND.AGRI.ZS/countries>, accessed 12/06/2012
- WORLD BANK (2013c): Databank: Featured indicators: Employment in agriculture (% of total employment). <http://data.worldbank.org/indicator/SL.AGR.EMPL.ZS/countries>, accessed 09/12/2012
- WORLD BANK (2013d): Databank: Featured indicators: Rural population (% of total population). <http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS/countries>, accessed 12/06/2012
- WORLD BANK (2013e): Home: Topics: Social Development: Participation & Civic Engagement: Participatory Monitoring and Evaluation. <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTPCENG/0,,contentMDK:20509352~menuPK:1278203~pagePK:148956~piPK:216618~theSitePK:410306,00.html>, accessed 9/20/2013
- WOYKE, W. (Ed.) (2008): Indien. Eine Einführung. Swalbach am Taunus: Wochenschau-Verlag.
- ZIAI, A. (2006a): Zwischen Global Governance und Post-Development. Entwicklungspolitik aus diskursanalytischer Perspektive. Münster: Westfälisches Dampfboot.
- ZIAI, A. (2006b): Post-Development: Ideologiekritik in der Entwicklungstheorie. Politische Vierteljahresschrift (2/2006), pp. 193-218.
- ZIAI, A. (Ed.) (2007): Exploring Post-development. Theory and practice, problems and perspectives. London, New York: Routledge.
- ZUNDEL, C. & R. BARUAH (2008): What is the contribution of organic agriculture to sustainable development? Long-term farming system comparison field trial in India.

ANNEX 1

Treatment details for the PTD mother trials on **phosphate rock application improvement** in India:

code	Treatment details
T-3	Compost
T-4	Compost + phosphate rock
T-6	Compost + phosphate rock + phosphorus solubilising bacteria
T-10	Farmer Practice (control)
T-11	Compost + phosphate rock + tamarind solution
T-12	Compost + phosphate rock + phosphorus solubilising bacteria + tamarind solution

T1, T2, T5, T7, T8, T9: Treatments were skipped as no impact on yield was observed

Source: FiBL 2013e

ANNEX 2

STANDARDIZED QUESTIONNAIRE ABOUT FARMERS' MOTIVATION



Forschungsinstitut für biologischen Landbau
 Institut de recherche de l'agriculture biologique
 Research Institute of Organic Agriculture
 Istituto di ricerca dell'agricoltura biologica
 Instituto de investigaciones para la agricultura orgánica



EBERHARD KARLS
 UNIVERSITÄT
 TÜBINGEN



QUESTIONNAIRE ABOUT FARMERS' MOTIVATION

Dear interviewee,

Under instruction of the SWISS RESEARCH INSTITUTE OF ORGANIC AGRICULTURE (FiBL) and bioRe India Ltd, I conduct a survey about the Participatory Technology Development (PTD). The PTD is a type of research where scientists and farmers work together on solutions for farming problems. I'd like to observe the impact of the PTD on your local situation. For this purpose, I would like to understand better what you think about your own motivation in working together with scientists. This information is very important for the PTD research because it helps the researchers from FiBL to find better solutions for your agricultural problems. In order to find such solutions (e.g. new agricultural technologies), the cooperation between farmers and scientists should be improved. This questionnaire tries to find out, how this dialogue between farmers and researchers can be improved.

For the following questions you have 7 answer options. Please choose only the one which best reflects your personal opinion.

Thank you for your kind cooperation!

Date: _____ Village: _____ No. Quest. _____ Name of farmer: _____

(I) BASIC MOTIVATION

Now you are given different sentences. Please decide in which way you agree/ disagree with the statement.

	<i>I strongly agree</i>	<i>I agree</i>	<i>I agree somewhat</i>	<i>Undecided</i>	<i>I disagree somewhat</i>	<i>I disagree</i>	<i>I strongly disagree</i>
1 I believe that I will succeed in whatever task I take on, even if it is a new and difficult one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I believe that I know enough and I have enough experience in order to be successful in what I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I have a lot of goals and/ or big goals in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 In order to achieve my goals I often make plans a long time before (several weeks, month or even years) in order to make sure I can achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 When I have to complete something I do it today and do not delay it to the	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	next day or next week or next month.	
6	I organize my daily life so that I can always get everything done that I have to do (for example field work).	<input type="radio"/>
7	I like to learn and try new things and I always look for new ideas which are interesting (for example a new agricultural technology).	<input type="radio"/>
8	I'm interested in learning new things even if I don't receive a reward (money or seeds or other material) for them.	<input type="radio"/>
9	I like to have a set routine at work and I do not like if I have to change my routine and do things differently.	<input type="radio"/>
10	It is easy for me to accept changes in my life or at work. I like to look for new ways to do things and for innovative solutions to my problems.	<input type="radio"/>
11	Whenever I try out something new I am confident that I will succeed, even if the new task is difficult.	<input type="radio"/>
12	I'm not afraid of speaking in front of other (unknown) people. I do not mind to say out loud what I think even if many other people are listening and looking at me.	<input type="radio"/>
13	I like to feel that I have done something better or faster than others (for example neighbors). I often want to "win".	<input type="radio"/>
14	I like to be in a situation where I can compare myself to others. That motivates me to be better.	<input type="radio"/>
15	I feel proud when others can see that I have done my best at work.	<input type="radio"/>
16	I always give my best at work and I am proud of that.	<input type="radio"/>
17	I always try to do my work in a way that makes it successful and so it does not fail or was in vain.	<input type="radio"/>
18	I even work harder on my tasks than is necessary. For example I spend more time on it than others or I check 2 or 3 times to make sure it has been done correctly. I do this because I want to make sure I do not fail.	<input type="radio"/>

(II) MOTIVATION FOR PARTICIPATION IN PARTICIPATORY RESEARCH

	<i>I strongly agree</i>	<i>I agree</i>	<i>Agree somewhat</i>	<i>Undecided</i>	<i>I disagree somewhat</i>	<i>I disagree</i>	<i>Strongly disagree</i>
19 I know very well how to observe, store, improve and process my crops. I even know it better than scientists because I am agricultural expert, too.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20 What I know about the crops is very valuable and I never forget this knowledge because then I can also find solutions or new technologies for our agricultural problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21 I always have to think about new ideas so that I can improve my agricultural situation. I feel responsible to act and I think it is also in my hand to have control over changes in agricultural technologies (new machines, new varieties of crops, new irrigation system...) on my farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22 Sometimes I try out a new or unknown technology in my field (own fertilizer, own pesticide, new green manure...). I do this because I want to discover something that is also new for other farmers. Maybe it can help us all to improve our production.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23 When I try out new agricultural technologies I like to work together with scientist because we can learn from each other. From the scientist I can learn how to analyze problems and the scientists can learn more about how I best manage my land.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24 Sometimes it is necessary that I spend a lot of time, energy, strong will and ideas in trying out new agricultural techniques. I have no problem to spend more time and energy than others when I think my new ideas can help the whole community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25 I want to improve my skills in observing, understanding, analyzing, selecting and manipulating tools, plants, animals and the environment. I believe that I could improve crop production by using these skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26 If there was the offer to join a group, a workshop or a seminar in my village where I can develop those skills I would participate immediately.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27 Whenever I have the opportunity to express my opinion and ideas about how to improve agricultural techniques I like to share and exchange my ideas with other farmers/ extensionists/ scientists.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28 I believe that I have power to decide about the changing agricultural activities in my village and I always try to influence decisions about this. For this reason I always go to meetings or I visit the bioRe farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(III) SELF-ESTIMATION

Please estimate your degree of motivation for the following descriptions of motivation facets. The descriptions show possible motives which might be the driving force for you to get active. You have 5 options for each facet: please chose number 5 if you think this item is the major force which motivates you; chose number 1 if you think you are not motivated at all by this item.

Always keep the following question in your mind:

“Is this motivation facet activating me to do something or is it NOT activating me to do something”

	1	2	3	4	5
29 <u>Confidence in Success:</u> Not only believing in destiny or luck but believing in one’s success, in one’s knowledge, in one’s skills and abilities.	<input type="radio"/>				
30 <u>Goal Setting:</u> Having dreams which one wants to realize and working hard on achieving these goals instead of only dreaming of them.	<input type="radio"/>				
31 <u>Self Control:</u> Organizing one’s work well and start working without delaying it to tomorrow.	<input type="radio"/>				
32 <u>Eagerness to Learn:</u> Having the desire to learn more. Having a strong thirst for knowledge even when there won’t be any reward for one’s learning process.	<input type="radio"/>				
33 <u>Flexibility:</u> Willingness to accept changes and new tasks (open mind). Flexible means also being interested in many things.	<input type="radio"/>				
34 <u>Fearlessness:</u> Not being afraid of failing at difficult tasks and not being nervous to speak in front of many people.	<input type="radio"/>				
35 <u>Competitiveness:</u> Motivation comes from wanting to compete with other people and being better and faster than others.	<input type="radio"/>				
36 <u>Pride in Productivity:</u> To enjoy doing one’s best at work and being proud of this.	<input type="radio"/>				
37 <u>Compensatory Effort:</u> Preparing oneself more than necessary in order to avoid failing at a work task.	<input type="radio"/>				

ANNEX 3

DIMENSIONS OF MOTIVATION OF THE STANDARDIZED QUESTIONNAIRE IN THE CASE STUDY

	Motivation Facet (<i>abbrev.</i>)	Specification
PART I Questionnaire ('Basic motivation')	<i>Facet 1: Confidence in Success (CS)</i>	CS describes the optimistic supposition of probably having success in a specific activity. CS is closely linked to a basic self-confidence of individuals and individuals with high scores in CS expect to succeed even in new or difficult tasks since they act with the aspiration to apply their capabilities and skills successfully.
	<i>Facet 2: Goal Setting (GS)</i>	This facet is related to the future. Individuals with high scores in GS are future-oriented and demand high standards of themselves and their future achievements. They tend to act well-planned and in the long term. They also have clear ideas about their professional and personal development.
	<i>Facet 3: Self-Control (SC)</i>	SC refers to the way of organization and of task accomplishment. Individuals with high scores in SC can be characterized as well planned, they don't tend to procrastinate job completion and concentration on their tasks comes naturally to them. They work diligently and disciplined, and they are able to accept austerity in order to achieve long-term goals (delaying rewards).
	<i>Facet 4: Eagerness to Learn (EL)</i>	EL characterizes the commitment and the willingness to learn something new and to enhance one's own knowledge and skills. Individuals with high scores in EL curious and eagerly interested. They spend time and a lot of care spontaneously in order to learn something new and to enhance their (specialized) knowledge. Those individuals esteem the increase of knowledge independently from immediate benefits.
	<i>Facet 5: Flexibility (FL)</i>	FL refers to the way of involvement with new kinds of tasks or situations. Individuals with high scores in FL are open for changes, and they don't tend to worry open or unclear situations running the risk of failure. FL thus means readiness to cope with changes and even the need for variation.
	<i>Facet 6: Fearlessness (FE)</i>	Analogically to <i>Confidence in Success</i> FE describes an individual's prospect of failure of an activity or task. Individuals with a high score in F do not fear failure or negative feedback from others. They tend not to be frustrated through failure and difficult tasks do not strongly prejudice their performance. Furthermore, they do not tend to avoid difficult or new task. Time pressure, acting in public or novelty of a task does not make them nervous.
	<i>Facet 7: Competitiveness (C)</i>	C captures the tendency to experience competition or rivalry as incentive for (professional) achievement motivation. Individual with high scores in C seek for competition and comparison with others. They place high value on winning and being better and faster than others since winning encourages them in their efforts.
	<i>Facet 8: Pride in Productivity (PP)</i>	PP denotes the need to repeatedly experience the positive feeling that is attributed to success and the positive effect on self-esteem of an individual. Individuals with high scores in PP are satisfied

		once they have given their best performance. They tend to seeking for the increase of their own performance, are very ambitious and their self-esteem is highly dependent on their performance.
	<i>Facet 9: Compensatory Effort (CE)</i>	CE denotes the endeavor of an individual that results from the fear of failure. CE is a constructive coping strategy (task accomplishment takes place without decreasing the aspiration level). Individuals with a high score in CE show relatively much effort in order to avoid failure in a task. A behavior that is motivated by CE indicates that the individual has a distinct tendency to fear failure and thus tends to have a low level of fearlessness.
PART II Questionnaire ('motivation for participation in participatory research')	<i>Facet 10: Valorization of Indigenous Knowledge (VIK)</i>	This facet characterizes the consciousness about and confidence in own (traditional) knowledge systems as equal counterpart to modern or Western scientific knowledge systems. Individuals with high scores in VIK have a high self-esteem concerning their professional knowledge and their equal contribution to activities of participatory research. They recognize scientific elements behind their apparently unscientific knowledge system and highly esteem innovations generated by their own local and traditional knowledge.
	<i>Facet 11: Ownership (O)</i>	O refers to the aspects of individual identification with activities or tasks and responsibility for activities. Individuals with high scores in O accept responsibility for a project or for decisions and they tend to feel responsibility for the improvement of their livelihoods.
	<i>Facet 12: Experimentation (E)</i>	E refers to the disposition to discover new agricultural technologies by trial and error. Individuals with high scores in E are supposed to already testing unknown technologies or techniques or unusual combination of popular techniques/ technologies on their own or they are supposed to be at least interested in experimenting. This facet is closely linked with general motivation facets such as <i>Eagerness to Learn, Flexibility, and Confidence in Success or Pride in Productivity</i> . The latter is assumed to play a vital role in <i>Experimentation</i> facet since individuals tend to have the prospect to experience very positive feedback amongst peers once they have created a successful new technique/ technology.
	<i>Facet 13: Identification with the new role as Researcher (IR)</i>	IR takes into account the consciousness about the new task as researcher of an individual. Individuals with high scores in IR are interested in working together with researchers of modern Western knowledge systems and they tend to recognize their own scientific capabilities which are rooted in their own traditional knowledge system. Identification with this new role indicates the willingness to a certain dedication to scientific work that is associated with scientific and participatory experimentation (willingness to spend time and energy).
	<i>Facet 14: Capacity Building (CB)</i>	The facet CB characterizes the willingness and readiness to participate in CB measures in order to enhance mainly analyzing capabilities and skills for observation of experiment performance of participatory research. Individuals with high scores in CB have high degrees of <i>Eagerness to Learn</i> and <i>Flexibility</i> to learn something new. Additionally, they tend to work disciplined and diligently since learning is closely linked with <i>Self-Control</i> .

	<p><i>Facet 15: Decision Making (DM)</i></p>	<p>This facet denotes the disposition and the willingness to exert influence on activities in order to change (local) conditions. Individuals with high scores in DM have a high degree of felt power to directly change living conditions of their environment. Moreover, they tend to have high degrees in <i>Confidence in Success, Fearlessness and Goal Setting</i>.</p>
--	--	---

Source: ZAHUMENSKY 2013, based on GONSALVES et al. 2005 (vol. 1), and adapted and translated from SCHULER & PROSCHASKA 2001: 13ff.

ANNEX 4

CONVERSATION GUIDE FOR GUIDED INTERVIEW WITH PATRICK HOHMANN, CEO AT REMEI AG, SWITZERLAND (GERMAN LANGUAGE)

	Themenfeld	Leitfrage/ Erzählaufforderung	Konkrete Frage(n)
1	Unternehmensphilosophie	Sie legen Wert auf Ethik und Nachhaltigkeit in der Unternehmensführung: 2002 erhielten Sie den UNO-„Award for Sustainable Development Partnerships“; 2006 den „Swiss Award for Business Ethics“; 2009 den „ZKB Nachhaltigkeitspreis“.	<p>1. 1983 haben Sie die REMEI AG aus einer Geschäftsidee heraus gegründet. Anfang der 1990er beschlossen Sie konkret z.B. durch die Gründung von bioRe[®]India einen Beitrag dazu zu leisten, den Menschen auf der Welt eine gerechtere Lebenschance zu geben. Gab es Schlüsselerfahrungen dazu?</p> <p>2. Welche Zielkonflikte ergaben sich für Ihr Unternehmen?</p> <p>3. Haben sich Ihre Ziele (deshalb) im Laufe der Zeit verändert? Wenn ja, warum und inwieweit?</p> <p>4. Ist das Bio- und Fairness-Geschäft mittlerweile wirtschaftlich und damit nachhaltig? Welche Rolle spielt die Partizipation von Zielgruppen bei der Frage um Wirtschaftlichkeit des Unternehmens?</p> <p>5. Wie wichtig ist heutzutage und vor allem in einer hierarchisch geprägten Kultur wie Indien die sozio-politische Dimension von Hilfe zur Selbsthilfe = aktive Mitbestimmung?</p>
2	Partizipation allgemein	2007 startete in Indien das bioRe/FiBL-Langzeit-Forschungsprojekt, bei dem die partizipative Komponente auch eine wichtige Rolle spielt (PTD-Komponente des Forschungsprojektes).	<p>6. Wie definiert REMEI/ bioRe die aktive Beteiligung/ Mitgestaltungsrechte von bioRe-Baumwollbauern? (kooperativ oder kollaborativ?)</p> <p>7. Ein wesentlicher Aspekt partizipativer Zusammenarbeit ist es, die Bedürfnisse der Zielgruppen aufzudecken und Projektaktivitäten auf diese abzustimmen. Wie erfasst REMEI/ bioRe die Bedürfnisse von Baumwollbauern bzw. wie werden diese in Projektaktivitäten integriert?</p> <p>8. Welche Herausforderungen und Potentiale für Partizipation sehen Sie von der Seite der Landwirte und innerhalb des bioRe-Teams?</p> <p>9. Sehen Sie diesbezüglich Unterschiede zwischen bioRe India und bioRe Tanzania? Wenn ja, was ist der Grund dafür?</p>

3	Ambivalenz von Partizipation	In der Fachliteratur wird Partizipation als ambivalent kritisiert und in Entwicklungsprojekten oft als Alibi für Fundraising bezeichnet.	<p>10. Wie konsequent und nachhaltig setzt REMEI/ bioRe India den partizipativen Ansatz um?</p> <p>11. Welche Rolle spielt Partizipation in Projektanträgen für REMEI/bioRe India?</p> <p>12. Partizipation kann in Bevormundung umkippen und die tatsächliche demokratische Mitgestaltung von Zielgruppen unterminieren, ohne dass die Beteiligten es merken. Wie ist Ihre Einschätzung darüber?</p> <p>13. In der Praxis ist eine konsequente Umsetzung von Zielgruppen-Partizipation (= bottom-up-approach) aufgrund mangelnder Erfolge von Projektaktivitäten und der Langwierigkeit basisdemokratischer Prozesse nicht immer vorteilhaft. Ist für Sie deshalb eine top-down-Herangehensweise sinnvoller, bzw. notwendig?</p>
4	Partizipative Workshops und Befragungen	Ich habe im Auftrag von FiBL/ bioRe partizipative Workshops mit bioRe-Landwirten durchgeführt, um den Motivationsgrad der Teilnehmer zu messen und um die Landwirte zur aktiven Teilnahme am Forschungsprojekt zu motivieren.	<p>14. Befragungen zeigten in einer ersten statistischen Auswertung Veränderungen im Motivationsgrad VOR und NACH den durchgeführten Workshops. Was bedeutet das für Sie?</p> <p>15. BioRe-Landwirte haben die partizipative Zusammenarbeit sehr positiv angenommen. Partizipation wird allgemein oft und sehr stark auf die Zielgruppe bezogen und weniger auch die empfehlenswerte Übertragung auf interne Strukturen der Projektträger berücksichtigt. Wie schätzen Sie dies bei bioRe India ein?</p>
5	Zukunft partizipativer Arbeit und Forschung	Wirtschaft, Gesellschaft und Umwelt nachhaltig in Einklang zu bringen ist ein ambitioniertes Ziel.	<p>16. Die Erfolge Ihrer Geschäftsidee werden oft eher mit (sozio)-ökonomischen/ -ökologischen Faktoren gemessen, wie z.B. die Verschuldungsrate der Landwirte oder CO²-Emissionen. Wie machen Sie die sozio-politischen Folgen sichtbar?</p> <p>17. Wie wichtig ist für Sie die Partizipative Forschung zur Erreichung dieses Ziels? Verfolgen Sie überhaupt sozio-politische Ziele?</p> <p>18. Was denken Sie über die Kooperation zwischen FiBL und bioRe in Bezug auf die Erreichung Ihrer übergreifenden Ziele? Welchen Nutzen versprechen Sie sich davon?</p> <p>19. Wenn Sie an Ihre eigene Erfahrungen denken: Welche Lektion in Bezug auf eine idealistische Umsetzung der Philosophie partizipativer Zusammenarbeit würden Sie mir mit auf den Weg geben?</p>

Source: ZAHUMENSKY 2010

ANNEX 5

CONVERSATION GUIDE FOR GUIDED INTERVIEW WITH MR. VIVEK RAWAL (CEO AT BIORE LTD. / BIORE ASSOCIATION INDIA)

1. What is **your experience** with PRA/ participatory tools concerning the stimulation of motivation of participants?
 - a. In which **context** did you make experiences?
 - b. Discovering why and how to use participatory tools: was there any **effect on you**?
 - c. How do you try to stimulate interest, ownership and active participation of farmers? Are there any **constraints**?
 - d. In my final presentation of workshop results you could see changes in total motivation scores of different target groups before and after the participants have experienced participatory workshop tools: do you think participatory tools can stimulate the **long-term** pro-active participation of farmers?
2. Which **challenges** do participatory tools face according to your opinion (generally/ in India)?
3. Is there any **correlation** between cultural background and the effectiveness of participatory methods?
4. How do you think about **applying participatory tools** within bioRe Ltd./ bioRe Association?
 - a. With bioRe farmers?
 - b. With target groups of the bioRe association?
 - c. With bioRe Ltd. staff (extensionists)?
5. What is **collaboration** between development agents and development target groups for you?
 - a. How would you describe the power relations between them?
6. Which are general **advantages/ disadvantages** of participatory collaboration?
7. How important is **capacity building** of bioRe staff and target groups in participatory methods?
8. What do you think about **top-down** transfer of technologies vs. **bottom-up** approaches?
9. If you could rule the world:
 - a. How would you **create participation**?
 - b. Should there be farmers' participation **at all**?
 - c. **Why?** Why not?

Source: ZAHUMENSKY 2010