

**German Institute for Tropical and Subtropical Agriculture (DITSL)
at the Faculty of Organic Agricultural Sciences of the
University of Kassel**

**ASSESSMENT OF COMMUNITY BASED ACTIVITIES THROUGH
IMPLEMENTATION OF A PARTICIPATORY MONITORING AND
EVALUATION SYSTEM**

MSc Thesis

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STATUTORY DECLARATION:

I herewith declare that I composed my thesis submitted independently without having use any other sources or means than stated therein.

Date:

Signature:

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GLOSSARY

Adaptive capacity:

The ability of a system to adjust to moderate potential damages, to take advantages of opportunities, or to cope with the consequences. Adaptations, or changes in the system to better deal with problematic exposures and sensitivities, reflect adaptive capacity (Smit & Wandel 2006).

The capacities in a society that enable self-protection and collective action to prevent or cope with stressors (Pelling & High 2005)

The potential or ability of a system, region, or community to adapt to the effects or impacts of climate change (Smit 2001)

Adaptation

Adaptation is adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. This term refers to changes in processes, practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate. It involves adjustments to reduce the vulnerability of communities, regions, or activities to climatic change and variability (Smit 2001)

Collective action:

Action taken by a group (either directly or on its behalf through an organization) in pursuit of members' perceived shared interests (Marshall 1998)

Experimental learning:

The process whereby knowledge is created through transformation of experiences (Kolb 1984:38)

M&E:

Reflective, action-oriented process that seeks to build capacity, while generating knowledge leading to corrective actions or improvement. In the same line (Anandajayasekaram et al. 2008)

An approach of increasing decision-making and problem-solving capabilities through systematic inquiry (King 2007)

A communication process, which requires the creation of an information sharing system, namely feedback loops, which guarantees collective learning, therefore making possible action (Gujt 1999, 2008)

A process of collective or social learning (Mahanty et al. 2007)

Joint learning by sharing ideas and experiences and by reflecting in the success and failure of the action (Hagmann et al. 1999)

Social capital:

“An attribute of individuals and their relationships that enhance their ability to solve collective action problems” (Ostrom & Ahn 2003)

Social learning:

A process of social change in which people learn for each other in ways that can benefit wider social-ecological systems

Transformative learning:

Focuses on how to transform the way in which adults see things (Mezirow 2000). How to encourage learning by reflection, altering the perception and consciousness of individuals (Mezirow 2000).

Uncertainty:

Imperfect knowledge, and is a function of time: further the future, grater the uncertainty (McConnell & Dillon 1997).

Vulnerability:

The ability or inability of people or social groups to respond (cope, recover or adapt) to any external stress on their livelihoods (Keen et al. 2005)

ABSTRACT

The impact of extremes causes livelihood disruption among resource-dependent communities. Climate variability is expected to increasing production failure rates. Agro-pastoralists need to change their livelihood strategies to maintain food security and income generation. This research examines how increasing the active-learning possibilities of agro-pastoralists improves their livelihood strategies. In this frame, a participatory monitoring and evaluation system, using a five-step methodology, was designed and implemented for two community-based organizations in rural Mozambique. The PM&E was structured as an iterative learning process with cycles of exploration, analysis, decision-making, action, and reflection. Its development was based following a set of principles, which allowed CBO members to be the owners of their own process.

The PM&E system promoted learning and empowerment among CBO members, which in turn created opportunities for consensus building, collective sense making and action. It enhanced and fortified the skills of CBO members to plan, implement, and follow a PM&E system. At the same time, the PM&E process showed to be a motivational aspect that acted as a positive feedback to community-based activities. It increased the efforts of the community to continue with their activities and the PM&E system itself. Key factors form the CBO to enable community-based activities were trust, leadership and decision-making processes

CONTENTS

ACKNOWLEDGEMENTS	iii
GLOSSARY	iv
ABSTRACT	vi
1 INTRODUCTION	1
1.1 OBJECTIVES	3
2 LITERATURE REVIEW	4
2.1 PARTICIPATORY MONITORING AND EVALUATION	4
2.1.1 General characteristics	4
2.1.2 Objectives	4
2.1.3 Principles	6
2.1.4 Implementation	7
2.1.5 Sustainability of M&E	8
2.1.6 PM&E and learning	9
2.2 COMMUNITY-BASED ACTIVITIES: COMMUNITY-BASED ORGANIZATIONS AND COLLECTIVE ACTION	15
2.2.1 Community-based organizations	15
2.2.2 Collective action	18
2.2.3 Social capital	19
2.3 LOW EXTERNAL INPUT AGRICULTURE	23
2.3.1 Farming systems in Southern Africa	23
2.3.2 Farming system characteristics in less-favoured areas	24
2.3.3 Smallholder agriculture and climate change	27
3 MATERIALS AND METHODS	30
3.1 STUDY REGION AND SYSTEM	30
3.1.1 General conditions	30
3.1.2 Livelihood and farming systems	31
3.1.3 Villages	31
3.2 STUDY CONTEXT	32
3.3 DATA COLLECTION	35
3.3.1 DEVELOPMENT AND IMPLEMENTATION OF A PM&E SYSTEM	37
3.3.2 IS THE PM&E AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?	42
3.3.3 WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?	43
3.4 DATA ANALYSIS	45
	vii

4	RESULTS	46
4.1	DEVELOPMENT AND IMPLEMENTATION OF PM&E SYSTEM	46
4.1.1	STEP 1: Planning the PM&E	46
4.1.2	STEP 2: PM&E focus	49
4.1.3	STEP 3: PM&E system development	50
4.1.4	STEP 4: PM&E information collection and analysis	52
4.1.5	STEP 5: Presentation and action plan	56
4.2	IS THE PM&E SYSTEM AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?	60
4.2.1	Handling of the gathering and analysis of PM&E information by the team members	60
4.2.2	Usefulness of PM&E system	61
4.2.3	Appropriateness with regard to the different group activities	65
4.3	WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?	66
4.3.1	CBO structure	67
4.3.2	CBO performance	71
4.3.3	Lessons learnt by the CBO members	74
5	DISCUSSION	77
5.1	DEVELOPMENT AND IMPLEMENTATION OF PM&E SYSTEM	77
5.1.1	PM&E Principles	77
5.1.2	PM&E and learning	83
5.2	IS THE PM&E SYSTEM AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?	85
5.2.1	Handling of PM&E information gathering and analysis by the PM&E team members	85
5.2.2	Usefulness of the PM&E system	86
5.2.3	Appropriateness with regard to the different group activities	87
5.3	WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?	88
5.3.1	CBO Structure	88
5.3.2	CBO performance	90
6	CONCLUSIONS AND RECOMMENDATIONS	90
7	REFERENCES	92
8	APPENDICES	103
8.1	Appendix 1: TOOLS	103
8.2	Appendix 2: PM&E ASSESSMENT	108

8.3	Appendix 3: PERFORMANCE INQUIRY	108
8.4	Appendix 4: SYMBOL-BASED INSTRUMENTS	109

LIST OF TABLES

Table 1:	Objectives and benefit of a PM&E	5
Table 2:	Learning theories and key characteristics	10
Table 3:	Social learning definitions	12
Table 4:	Overviews of costs and benefits from participating in CBOs	17
Table 5:	Definition of collective action	18
Table 6:	Definitions of social capital	20
Table 7:	Characteristics of coping and adaptive mechanism	26
Table 8:	Definitions of adaptation in the context of climate change	27
Table 9:	Characterization of the villages	33
Table 10:	Structure of the CBOs in Mabomo and Mungazi	34
Table 11:	Specific objectives of the CBOs in Mabomo and Mungazi	35
Table 12:	Profile of 11 CBO members interviewed in Mabomo	37
Table 13:	Profile of 10 CBO members interviewed in Mabomo	37
Table 14:	Data collection methods of the three components of the research	37
Table 15:	Steps to develop a PM&E system	39
Table 16:	Guiding questions to develop a PM&E system	40
Table 17:	Components, questions and criteria for the assessment of implementation, usefulness and appropriateness of a PM&E system	44
Table 18:	Related to the PM&E focus activity in the CBO in Mabomo (MA_G1)	50
Table 19:	Related to the PM&E focus activity in the CBO in Mungazi (MU_F1)	50
Table 20:	Issues, indicators and data collection methods of the PM&E system in Mabomo (MA_W, MA_F2)	51
Table 21:	Issues, indicators and data collection methods of the PM&E system in Mungazi (MU_W)	51
Table 22:	PM&E information collected for goat keeping activity in the CBO in Mabomo (MA_W, subsequent)	53
Table 23:	PM&E information collection for revolving loan scheme develop in the CBO in Mungazi (MU_F2)	54
Table 24:	Result from the SWOT analysis performed in Mabomo (MA_G2)	57
Table 25:	Result from the SWOT analysis performed in Mungazi (MU_F3)	58
Table 26:	Comparison of the main issues in the development of the PM&E system in Mabomo and Mungazi	59

Table 27: Comparison of handling of information gathering and analysis during the PM&E implementation process for the CBOs in Mabomo and Mungazi	61
Table 28: Perception of the CBO members in Mabomo regarding the state of the activities planned and implemented	62
Table 29: Perception of the CBO members in Mungazi regarding the state of the activities planned and implemented	63
Table 30: Comparison of the man motivational aspects for the CBOs in Mabomo and in Mungazi	67
Table 31: CBO members' perception of the rules less complied	67
Table 32: Decision-making process in the CBO in Mabomo and Mungazi	69
Table 33: Comparative summary the structure of the CBOs in Mabomo and Mungazi	70
Table 34: Perception of benefits and contribution of CBO members in Mabomo	71
Table 35: Perception of benefits and contribution of the CBO members in Mungazi	72
Table 36: Perception of a good working CBO in Mabomo	73
Table 37: Perception of a good working CBO in Mungazi	73
Table 38: Comparative summary of the perceived performance of the CBOs in Mabomo and Mungazi CBO	74
Table 39: Lessons learnt by the members of the CBO in Mabomo	76
Table 40: Lessons learnt by the members of the CBO in Mungazi	76
Table 41: Assessment of learning outcomes for the CBOs in Mabomo and Mungazi	83

LIST OF FIGURES

Figure 1: Kolb learning cycle. Source (Kolb)	10
Figure 2: Transformative learning. Source (Tarnoczi 2011)	11
Figure 3: A multiple-loop learning framework. Adapted from (Armitage et al. 2008)	13
Figure 4: Social learning model. Source (Muro 2006)	14
Figure 5: Factors that influence collective action outcomes in a common pool resource. Modified form (Agrawal 2001, Araral 2009)	19
Figure 6: Social capital forms and their entailment with collective action. Source (Ostrom & Ahn 2003)	21
Figure 7: Possibilities to create or increase adaptive capacity through social capital. Source (Pelling & High 2005)	22
Figure 8: Major farming system in Sub-Saharan Africa. Source: (Dixon et al. 2001)	24
Figure 9: Map of the study area. Source (Ara-Sul 2002)	30
Figure 10: M&E learning cycle. Modified from Woodhill & Robins (1998)	36
Figure 11: Steps used to develop and implement PM&E system in the CBOs in Mabomo and Mungazi	38

Figure 12: Steps used to assess the implementation, usefulness of the PM&E system Mabomo and Mungazi	43
Figure 13: Steps used to assess the key opportunities and barrier form the CBOs to enable community-based activities	43
Figure 14: Steps used to develop and implement PM&E system in the CBOs in Mabomo and Mungazi	46
Figure 15: M&E drawing used during the PM&E-planning meeting in Mabomo (MA_G1) and Mungazi (MU_F1). Modified form (Germann & Gohl 1996) Booklet 1 (see Appendix 1: TOOLS for text content in English)	47
Figure 16: Goats herd collectively purchased by the CBO in Mabomo (left), with the care of the herd assigned to a single CBO member, the herder (right)	47
Figure 17: Development of PM&E instrument in Mabomo (MA_W1)	52
Figure 18: SWOT analysis with the CBO members in Mabomo (left) (MA_G2) and Mungazi (right) (MU_F3)	58
Figure 19: Pig (right) and goat (left) corrals in Mungazi	64
Figure 20: Instrument for the PM&E of the pig keeping activity in Mabomo (see de- codification of the symbols in Appendix 4: SYMBOL-BASED INSTRUMENTS)	64
Figure 21: Model that integrates the PM&E principles to the development and implementation of the PM&E system. The five-step methodology is situated in the middle of the model. Principles attained in specific steps of the process are at the left side, while principles implemented during the five-step methodology are at the right side of the model. In the bottom stands learning and empowerment, which are objectives of M&E system, and outcomes.	78
Figure 22: PM&E learning cycle (based on Woodhill & Robins 1998) for the CBO in Mabomo: creation of the PM&E instrument and data register (left), and its validation (right)	84
Figure 23: PM&E learning cycle (based on Woodhill & Robins 1998) for the CBO in Mungazi	85

1 INTRODUCTION

Agro-pastoralists are one of the most important farming systems in Southern Africa. This farming system is based on maize production, which is the major staple food, and the main cash sources are remittances, cattle and small ruminants, and the sale of food crops (Dixon et al. 2001). Agro-pastoralists are resource dependent-communities, which livelihood is connected to variability and productivity of the natural resource base. Impact of extremes causes livelihood disruption among them. Within different climate change scenarios for this farming system, failure rates are projected to increase between 18 to 30% (Jones & Thornton 2009). The effects will be stronger to resource-dependent communities, where maize cultivation will no longer be possible (Jones & Thornton 2009). Moreover, by 2025, annual average precipitation in southern Mozambique is expected to decrease between 10-15% (Ragab & Prudhomme 2002), with an increase in the intensity of erratic rains (Cook et al. 2004), and greater probability of dry years (Usman & Reason 2004). Agro-pastoralists need to change their livelihood strategies to maintain food security and income generation.

Vulnerability of agro-pastoralists could be address by increasing their adaptation strategies to improve livelihood opportunities. Studies performed in Africa to capture farmers' perception of climate variability and adaptation strategies, establish that adaptations are promoted by greater farming experience, better access to information, farmer-to-farmer learning, and being previously exposed to other learning opportunities (Hassan & Nhemachena 2008, and Deressa et al. 2009). These findings are in accordance with an 'adaptation with climate' approach. Here, adaptation is seen as continue process of learning and development (Ison et al. 2007), which warrants that integrated and concerted actions are developed (Collins & Ison 2009a).

For this, the active-learning possibilities of agro-pastoralist need to be increased. Within this context, a Participatory Monitoring and Evaluation (PM&E) system where CBO members are engaged in an on-going process of exploration, analysis, decision-making, action and reflection plays a key role. This process permits the CBO members to learn about PM&E process and about the outcome of the community-based activities implemented in the frame of the project. At the same time it allows the identification of possible constrains or improvement options.

Participatory monitoring and evaluation (PM&E) has different definitions in literature. It is essentially a continues process in which participant are encourage to reflect on the learning that has taken place; where multiple knowledge are involved in a collaborative process; where effective learning supports action regarding decisions made from the M&E process;

and where participants are promoted to work toward best practices (Cundill & Fabricius 2009).

This master thesis demonstrates how a participatory monitoring and evaluation system (PM&E), aiming to support community-based activities, can be designed and implemented based on learning principles. The implemented PM&E system was structured as an iterative learning process with cycles of exploration, analysis, decision-making, action and reflection. It follows a qualitative approach, which focuses on the perception and experiences of the CBO members in relation to the implemented PM&E system. The design and implementation of the PM&E system was guided by a set of principles that allowed CBO members to be the owners of their own process.

The analysis of the implemented PM&E seeks to provide qualitative empirical data to elucidate the key elements for its successful establishment. The hypothesis that a PM&E system is an effective approach in supporting community-based activities is critically approached. At the same time key opportunities and barriers from the CBOs to enable community-based activities are analyzed.

This master thesis was developed within the collaborative project "Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach" which is funded by the German Federal Ministry of Economic Cooperation and Development (BMZ). The project aims to increase the adaptive capacity of agro-pastoralists to climate variability and to the expected effects of future climate change (DITSL 2011). In the frame of the project two Community-Based Organizations (CBOs) were formed during the first trimester of 2010; one in the village of Mabomo and the other in the village of Mungazi, both in the Mabalane District of the Gaza Province, Mozambique. An important guiding focus of the CBOs was the empowerment through collective action and social learning, emphasizing on the potential to build collaborative networks to take action, reflect upon outcomes, and modify future directions from community-based activities (Levy 2010). At the same time, the project intended to build local capacity for project planning and management through strengthening newly created CBOs.

The thesis is organized into six chapters. Following this introduction, Chapter 2 contains a review of the relevant literature. This literature review is arranged in three sections that summarize the current knowledge regarding PM&E (participatory monitoring and evaluation) systems, community-based organizations, and low external input agriculture. Chapter 3 describes the location of the study and the research methods used. Results of the investigation, divided into three sections according to the objectives of the study, are presented in Chapter 4. Section 4.1 consists of the results from the development and

implementation of a participatory M&E system in two CBOs. Section 4.2 comprises the assessment of the implementation, usefulness and appropriateness of the PM&E system. Section 4.3 contains an evaluation of the CBOs potential to enable community-based activities. Chapter 5 discusses the results. Chapter 6 is a conclusive chapter, which addresses the implications of the research.

1.1 OBJECTIVES

The general objective of the master thesis was to increase the active-learning possibilities of agro-pastoralist for improving their livelihood strategies and the sustainability of the system

The specific objectives of the master thesis were:

1. Develop and implement a participatory M&E system for the assessment of adaptation strategies conducted in CBOs;
2. Assess the implementation, usefulness and appropriateness of the PM&E system;
3. Evaluate the CBOs potential to enable community-based activities.

The research was based on the following questions:

1. What are elements of successful PM&E system?
2. Is the PM&E system an effective instrument to support community-based activities?
3. What are key opportunities and barriers from the CBOs to conduct community-based activities?

2 LITERATURE REVIEW

2.1 PARTICIPATORY MONITORING AND EVALUATION

2.1.1 General characteristics

As described by Estrella & Gaventa (1998), there is a considerable amount of terms used to describe participatory monitoring and evaluation processes: Participatory evaluation (PE), participatory monitoring (PM), participatory assessment, monitoring and evaluation (PAME), participatory impact monitoring (PIM), process monitoring (ProM), self-evaluation (SE), auto-evaluation, stakeholder-based evaluation/stakeholder assessment, community monitoring/citizen monitoring (CM). In this study, I will use the term participatory monitoring and evaluation (PM&E).

There are as many definitions used to describe PM&E processes, as terms to name it. On one line, Anandajayasekeram et al. (2008) describe it as a reflective, action-oriented process that seeks to build capacity, while generating knowledge leading to corrective actions or improvement. In the same line, King (2007) consider it as an approach of increasing decision-making and problem solving capabilities through systematic inquiry.

On other line, Guijt (1999, 2008) describe it as a communication process, which requires the creation of an information sharing system, namely feedback loops, which guarantees collective learning, therefore making possible action. Likewise, Mahanty et al. (2007) describe it as a process of collective or social learning, while Hagmann et al. (1999) describe it as joint learning by sharing ideas and experiences and by reflecting in the success and failure of the action.

The term M&E system refers to the set of activities that must be undertaken to plan for M&E, gather and analyse information, report and support decision-making and implementation of improvements (Woodhill 2007). In summary, PM&E promotes learning processes that in turn create opportunities for consensus building, collective sense making and action. PM&E has also been associated with the enhancement of trust relationships (Rist et al. 2006), and in general increasing collaboration therefore social capital between actors (Armitage et al. 2008).

2.1.2 Objectives

Given the wide range of application of PM&E process, it can be used to achieve multiple purposes and benefits (see Table 1), such as empowerment of stakeholder to take action,

improved accountability, improve strategic planning, and learning (Guijt 1999, Woodhill 2007, Cundill & Fabricius 2009).

Esterella (2000) distinguishes the objective of M&E between monitoring and evaluation findings and the use of the process. While the evaluation findings can be used to make judgment, to improve the project management cycle or to generate knowledge, the use of the process is related to the experience gained in iterative cycles of action, observation and critical reflection (Estrella 2000).

Table 1: Objectives and benefit of a PM&E

OBJECTIVES	BENEFITS OF PM&E
To provide accountability of project and programme expenditure to funding agencies	A condition for receiving funding; More funding, if the outcome is positive.
To review implementation of projects/programmes	Better understanding of the realities and, therefore, more realistic and appropriate plans; Timely identification of bottlenecks in carrying out activities as planned, so timely adjustments to plans, schedules and/or budgets; Opportunity to improve the effectiveness and efficiency of activities; Knowing whether activities are achieving desired outcomes; or are having unanticipated negative impacts that need correcting; Information to convince others of the merits of one's efforts, for example, when influencing policy makers.
To provide public accountability of local and national government programmes to communities	Local empowerment; Helps ensure that project and programme impacts influence and reorient policy; Encourages institutional reform towards more participatory structures;
To strengthen organizations	Better working environment as learning from mistakes eases performance fears; More motivated staff; local and staff empowerment; Better programmes and, therefore, more locally appropriate development; Less waste of money and time; More self-development initiatives.
To understand and negotiate stakeholder perspectives	Re-assessment of objectives and attitudes by funding agencies.
To provide information at different levels	To provide information at different levels.
Knowledge creation	Generating new insights that contribute to the established knowledge in a given field.
Empowerment	Building the capacity, self reliance and confidence to effectively guide, manage and implement development initiatives.

Source: Guijt 1999, Woodhil 2007, Cundill & Fabricius 2009

2.1.3 Principles

Establishment of core principles for PM&E means accepting diversity in the design and implementation, but also clarifying the understanding of what is PM&E and how it should be implemented. When these principles are foreseen in the design and implementation of M&E system, it is ensured that learning and change takes place (Estrella et al. 2000). Said in other words, these principles shape the M&E effort.

The principles of PM&E process are participation and collaboration; context specificity; inclusiveness; learning; flexibility; and empowerment:

1. Participation and collaboration: opening the process to involve and be useful to the program's end users (Burke, King et al. 2007, Anandajayasekeram et al. 2008), fostering collaboration (Maarleveld & Dabgbgnon 1999, Mahanty et al. 2007, Anandajayasekeram et al. 2008). Participation promotes self-sufficiency and sustainability while it increases ownership and responsibility (Estrella & Gaventa 1998), as it increases the probability that PM&E data will be considered valid, will be understood, and will be used to improve decision-making processes (Cundill & Fabricius 2009). M&E is a collaborative problem-solving process (Estrella & Gaventa 1998, Mahanty et al. 2007);
2. Context specificity: the PM&E process must be embedded in the concerns, interest and problems of the program's end user (Burke 1998, Anandajayasekeram et al. 2008);
3. Inclusiveness: PM&E requires negotiation to reach agreement on the process of development and implementation of the monitoring and evaluated (Burke 1998, Estrella & Gaventa 1998, Guijt 1999, Anandajayasekeram et al. 2008);
4. Learning: participants learn from the reflection on their experience and gain ability to improve by planning and undertake corrective actions (Burke 1998, Estrella & Gaventa 1998, King 2007, Mahanty et al. 2007, Anandajayasekeram et al. 2008, Guijt, 2008);
5. Flexibility: PM&E is a process continually evolving and adapting to the specific circumstances (Estrella & Gaventa 1998, Guijt, 1999, Anandajayasekeram et al. 2008). There is a need of creativity to adapt methods to the context being evaluated (Estrella & Gaventa 1998, Anandajayasekeram et al. 2008), including the use of multiple and varied approaches (Burke 1998);
6. Empowerment: participants of CBOs strengthen internal accountability by sharing and analyzing experiences (Papineau & Kiely 1996, Burke 1998, Estrella & Gaventa

1998, King et al. 2007, Mahanty et al. 2007, Anandajayasekeram et al. 2008). At the same time, they improve in project management, decision-making, problem-solving, and allocation of resources (Papineau & Kiely 1996, Estrella & Gaventa 1998, Anandajayasekeram et al. 2008);

These principles allow end users to be the principal decision-makers on matters related to their livelihood and welfare. At the same time, innovation can occur when such principle drive the process (Estrella et al. 2000), as they are not a blue-print.

In PM&E, a crucial role is that of the facilitator. Here, the evaluator acts as a facilitator that assists stakeholders in asking key questions (King et al. 2007, Anandajayasekeram et al. 2008). Evaluator should facilitate learning, helping stakeholder feeling empowered (Burke 1998). The facilitator should understand both the practicalities and principles of M&E system (Woodhill & Robins 1998), preventing the process from becoming mechanical, and helping to negotiate (Estrella et al. 2000).

2.1.4 Implementation

Participatory monitoring and evaluation consists of five basic steps, as discusses below. Nevertheless, there is not a blue-print, as previously stated by Estrella & Gaventa (1998) and Hagmann et al. (1999). These steps should be followed with flexibility, guided by the M&E principles (Woodhill & Robins 1998, Estrella et al. 2000).

1. Pre-planning and preparation: outline a conceptual framework based on participatory evaluation principle (Estrella 2000, Anandajayasekeram et al. 2008). This framework should be clear to all stakeholders involved in process. In other words, for stakeholders to pay an active role in designing and implementing the evaluation they need to understand what is all about (Burke 1998);
2. Generating evaluation questions: collectively identify the evaluation focus and objective (Woodhills & Robins 1998, Estrella 2000, Anandajayasekeram et al. 2008). This is a critical step for the success and effectiveness of the process, reason why it should involve higher number of people as possible (Estrella and Gaventa 1998);
3. Data gathering: this step should be done collectively, and the method to be used should depend on local experience, expertise and knowledge (Woodhill & Robins 1998, Burke 1999, Estrella 2000, Anandajayasekeram et al. 2008). Triangulation and cross-checking of the information to verify and validate the process is very important (Woodhill & Robins 1998, Burke 1999, Anandajayasekeram et al. 2008);
4. Reflection and action: collective analysis of the data aids in creating validity and new knowledge, as it facilitates the planning for corrective actions or future action plans

(Woodhill & Robins 1998, Burke 1999). For this, end users may get involved in critical reflection about problems, constraints, success and outcomes of their activities (Estrella & Gaventa 1998, Estrella 2000);

5. Outcomes and reports: it should be clear from the beginning how end users are going to use and present the results (Burke 1999). The main criteria for the presentation should include clarity, simplicity, use of visuals and accessibility (Estrella & Gaventa 1998, Woodhill & Robins 1998).

According to Guijt (2008), in general M&E guidelines ignore processes to analyze, critically reflect, interpret, and communicate information. To correct this, resources should be allocated in building capacities to stimulating critical reflection (Guijt 2008), which requires participants to question, doubt, and consider different assumptions (King et al. 2007).

There is a wide range of methods and tools that can be used in PM&E. These include PRA, audiovisual tools, quantitative tools and many others. Combining tools and techniques is required for data triangulation, and achieving validity (Estrella & Gaventa 1998, Anandajayasekeram et al. 2008). The entire process may involve several workshops with the stakeholders: a planning workshop, where stakeholders can define the parameters of the evaluation, a smaller workshop for data collection and possibly another workshop for the analysis of data and feedback (Anandajayasekeram et al. 2008).

2.1.5 Sustainability of M&E

When developing and implementing PM&E, one of the objectives is that stakeholders continue using the system in the long-term. Guijt (1999) described some factors influencing people's sustained participation in PM&E as the perceived benefits, the flexibility of the process, the quick and relevant feedback of findings, and the capacity to act on the recommendations arising from the process. Since M&E systems are designed to fill information needs, for them to be successful, stakeholders should be able to anticipate information needs (Guijt, 2008). Moreover, a participative process increases motivation by highlighting the success of people's efforts, while it also strengthens working relationships (Guijt 1999). To put it in a different way, the active use of the information with stakeholders not only improves the work, but also strengthens the groups involved. As stated by Guijt (1999), these types of learning processes make PM&E valuable.

In rural areas it is common that local people undervalue their own knowledge. The process of sharing experiences and collectively solving problems, increases awareness of the value and application of their own knowledge (Millar & Curtis 1997, Rist et al. 2006); thus empowers (Blackstock et al. 2007) and motivates (Hagmann & Chuma 2000), which is a precondition for overcoming feelings of helplessness, powerlessness and apathy (Hagmann

et al. 1999). A learning-oriented, monitoring and evaluation process helps in motivating and empowering communities to take action themselves, which, in turn, strengthens local capacities and promotes self-reliance (Ward 2000). When a PM&E highlights the successes of people's efforts, motivation increases (Guijt 1999), and in turn increases the efforts to continue with the activities and the PM&E system. At the same time, reciprocity, or the simultaneous exchange of goods and knowledge, increases trust (Pretty & Ward 2001, Ostrom & Ahn 2003, Pretty 2003), therefore strengths the collective action.

2.1.6 PM&E and learning

As stated by Woodhill (2007), for M&E to be successful, it must be focused on learning. The learning building blocks of M&E should rely on practice. It is the capacity of learning from experiences that gives M&E participants the ability to solve real-world problems (Woodhill & Robins 1998, Woodhill 2007). A M&E learning system is characterized by the following (Woodhill 2007):

- Clear analysis of the stakeholders involved, their information and learning needs and their power relations;
- Creation of a set of norms and values and level of trust that makes transparency of performance and open dialogue about success and failure;
- Design and facilitation of the necessary interactive learning processes that make critical reflection on performance possible;
- Establishment of clear performance and learning questions that deal with the what, why, so what and now what aspects of M&E;
- The collection, analysis and presentation of information in a way that triggers interest and learning from those involved.

Within the context of M&E, aspects of experimental learning theory (Kolb), transformative learning theory (Mezirow 2000) and social learning theory (Argyris & Schön 1978), provide the basis for discussion. Table 2 offers a summary of these learning theories, and their key characteristics, while in the following paragraphs they are described in more detail.

In M&E learning can be view as the ability to improve the efficacy of actions (Woodhill 2007). Such learning is assumed to require systematic seeking and sharing of information, hence the need for feedback loops for which monitoring is considered the prime vehicle (Guijt, 2008). As the building blocks of M&E learning in this context rely on practice, experimental learning becomes important. As describe by Kolb (1984:38) experimental learning is “the process whereby knowledge is created through transformation of experiences”. It follows a

cyclic process composed of four dimensions, as seen in Figure 1 (Kolb): (i) having an experience; (ii) reflecting on that experience; (iii) conceptualizing from the experience; and then (iv) testing out new ideas/concepts which lead to a new experience.

Table 2: Learning theories and key characteristics

Learning theories	Key characteristics
Experiential learning Kolb (1984)	Learning as a process of creating knowledge through the transformation of experiences, learning-by-doing. This iterative learning cycle has four stages: concrete experiences, reflective observation, abstract conceptualization, and active experimentation. Largely modelled on individual learning processes, but also applied to group processes
Transformative learning Mezirow (1995,1996,2000)	Learning as a reflective process that enables an individual's perceptions and consciousness to be altered. Transformative learning includes instrumental (task-oriented, problem-solving actions to improve performance of current activities) and communicative (ability of individuals to examine and reinterpret meanings, intentions and values associated with actions and activities) learning. Largely modelled on individual learning processes
Social learning Argyris and Schon (1978), Keen et al (2005), Leeuwis and Pyburn (2002)	Learning as a process of iterative reflection that occurs when we share our experiences, ideas and environments with others. Social learning includes single-loop (correcting errors form routines), double-loop (correcting errors by examining errors and policies), and triple-loop (designing governance norms and protocols). Modelled on group learning processes

Source: (Armitage et al. 2008)

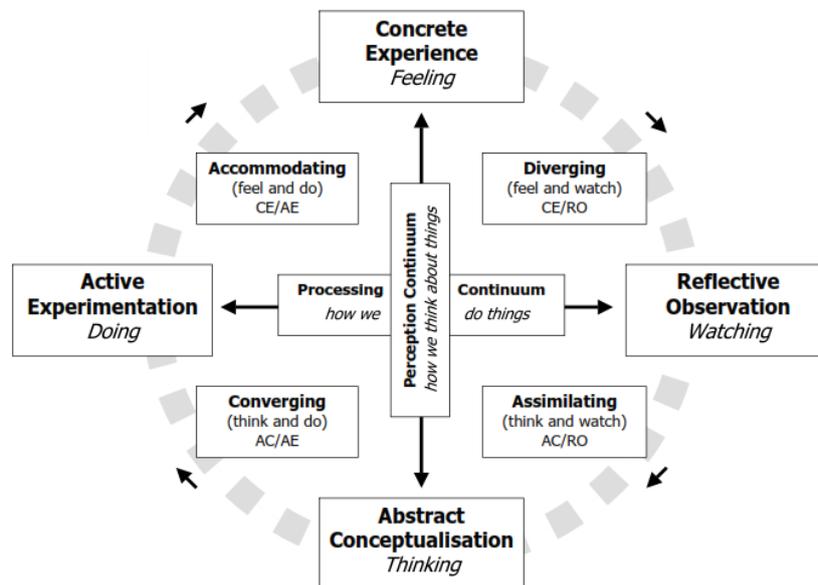


Figure 1: Kolb learning cycle. Source (Kolb)

Transformative learning theory, as part of the experimental learning theories, gives important insights into how adults learn. It focuses on how to transform the way in which adults see things (Mezirow 2000). It is basically a change on the frame of reference. It focuses on the processes of learning and accommodates the social context in which learning occurs

(Mezirow 2000). Transformative learning theory centers on how to encourage learning by reflection, altering the perception and consciousness of individuals (Mezirow 2000).

In this sense, learning occurs when there is a transformation of a frame of reference. In turn, a transformation of a frame of reference occurs with critical reflection on points of view and habits (Mezirow 2000). Transformative learning theory describes two pathways: transforming habits of mind and transforming points of view, as represented in Figure 2. Both pathways begin with information that is comprehended by instrumental and communicative learning (Mezirow 2000).

Instrumental learning, as described by Mezirow (2000), is that concerned with controlling or manipulating the environment. The main characteristics are: (i) obtaining skills and information; (ii) determining cause-effect relationships; and (iii) task-oriented problem solving.

Communicative learning, as described by Mezirow (2000), is that concerned with understanding and negotiating concepts and values. The main characteristics are: (i) understanding values and normative concepts, and (ii) understanding others' point of view.

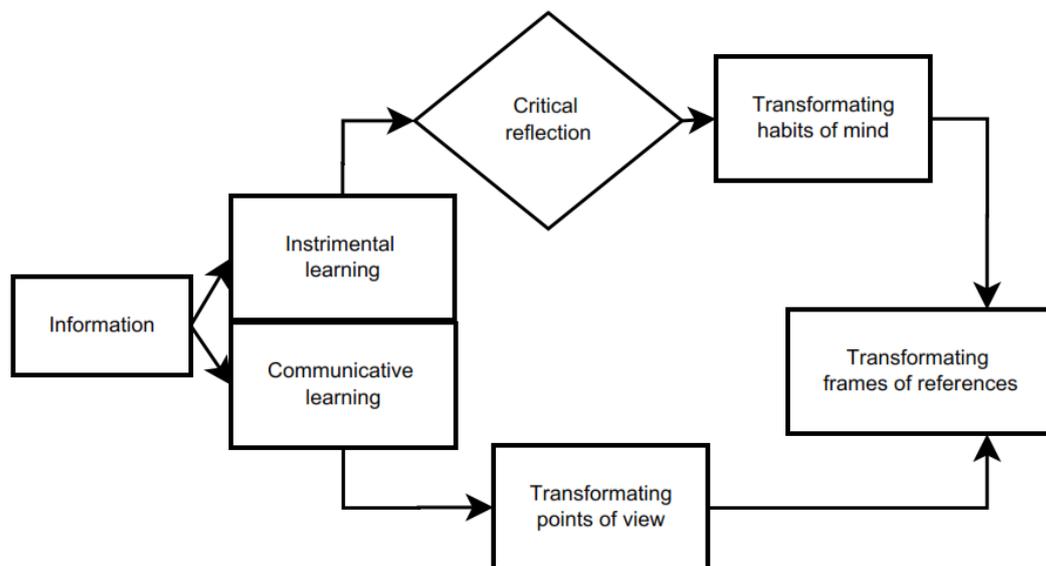


Figure 2: Transformative learning. Source (Tarnoczi 2011)

Transformative learning is believed to be important for flexible decision-making and autonomous thinking, making it advantageous for responding to changing environmental conditions. This is important for the development of climate change adaptation strategies (Tarnoczi 2011), where adults combine elements of instrumental and communicative learning when engage on observation and experimentation activities (Sims & Sinclair 2008, Tarnoczi 2011). Moreover, since small-holder farmers deal with uncertainty, they required of critical thinking to question actions, values, claims, and knowledge of a practice. Then

transformative learning is also advantageous to respond to changing conditions (Tarnoczi 2011).

Alternatively, the concept of social learning extends experimental learning into collective learning. That is why it is important to create adequate conditions to link experience, reflection and experimentation between individuals and groups (Kolb). For social learning to occur a change in understanding is necessary; as in transformative learning, critical reflection is a key point. Different schools of literature have conceptualized social learning in different lines. In this research the social learning concept used is that of a process of social change in which people learn from each other in ways that can benefit wider social-ecological systems (Reed et al. 2010). From more detailed definitions, see Table 3.

Table 3: Social learning definitions

AUTHOR	DEFINITION
Kolb (1984)	“a process of experiential learning”
Leev (1993), p.8	“a combination of adaptive management and political change ”
Thomas et al. (1995)	“a process of collective action to solve a shared problem”
Dangbegnon 1998	“a dynamic process which involves continuous sense-making of the world through perspectives or frames of reference based on concrete, experience-modified, knowledge, beliefs, values ”
Maarleveld and Dangbegnon (1999)	“a continuous dialogue and deliberation among scientists, planners, managers and users to explore problems and their solutions”
King (2000), p.43	“learning processes among a group of people who all seek to address shared problems and take action collectively”
Woodhill and Rolling (2000)	“action-oriented philosophy focusing in participatory processes of change”
Ison (2003)	“a process of collective action and reflection among different actors directed towards improving the management of human and environmental interrelations”
Keen et al. (2005), p.4	“the collective action and reflection that takes place amongst both individuals and groups when they work to improve the management of the interrelationships between social and ecological systems”
Rist et al. 2006	“the simultaneous transformation of cognitive, social and emotional competences as well as of social capital which includes attitudes and values related to collective or individual social actors emerging from the joint search for more sustainable management of natural resources at the interface between the world of rural actors, experts and public administration”
Ison et al. (2007)	“iterative approach to decision-making and problem solving”
Rist et al (2007)	“recognizing complexity and building shared understanding or ‘collective cognition’ of the problem ” “different actors can deliberate and negotiate rules, norms and power relations”
Pah-Wostl et al. (2007),	“iterative and ongoing process that comprises several loops and enhances the flexibility of the socio-ecological system to respond to change”

Source: (Hiyama & Keen 2005, Reed et al. 2010)

Another way of conceptualizing social learning is by the different cycles or loops of learning (Argyris & Schön 1978, Maarleveld & Dabgbagnon 1999), as shown in Figure 3. Single-loop

learning (correcting errors from routines) involves the identification of alternative strategies and actions to resolve specific problems, and improve outcomes by increasing the effectiveness and efficiency (Argyris & Schön 1978, King & Jiggins 2002). It occurs at individual level, and involves little reflection (Maarleveld & Dabgbagnon 1999). This learning also includes the first improvement of the capacity to make and implement collective decision (Pahl-Wostl 2009). Double-loop learning (reframing) involves renewing or doing the right things (Argyris & Schön 1978, Maarleveld & Dabgbagnon 1999). It implies a reflection on how goals can be achieved (Pahl-Wostl 2009), as it incorporates feedback of experience into planning (Hiyama & Keen 2005). Improvement is achieved by experimenting with innovative approaches (Pahl-Wostl 2009). Thus, it is characterized by trust building efforts, and willingness to take risks (King & Jiggins 2002, Armitage et al. 2008). The implementation of innovative approaches may not be possible without modifying the context and factors that determine the frame of reference (Pahl-Wostl 2009). Triple-loop learning (transforming) occurs through the reflection of single and double-loop learning (Maarleveld & Dabgbagnon 1999, King & Jiggins 2002). It is a consideration of why we do what we do.

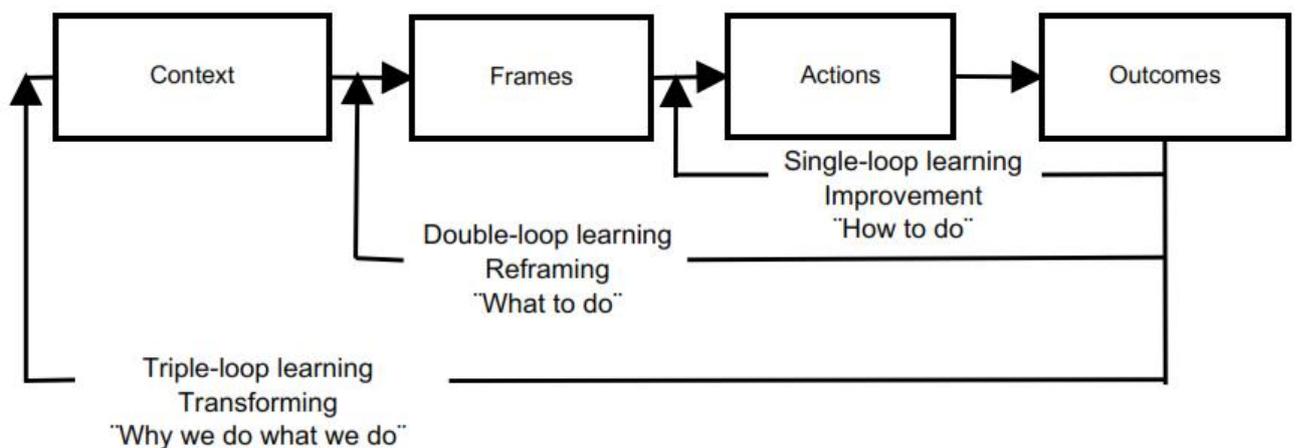


Figure 3: A multiple-loop learning framework. Adapted from (Armitage et al. 2008, Pahl-Wostl 2009)

On the other hand, Figure 4 presents a model of social learning, based on a literature reviewed performed by Muro (2006). The model includes (i) process features that foster social learning; (ii) communication and interaction in participatory processes; (iii) principal characteristics of social learning; (iv) what social learning leads to; and (v) what social learning contributes to.

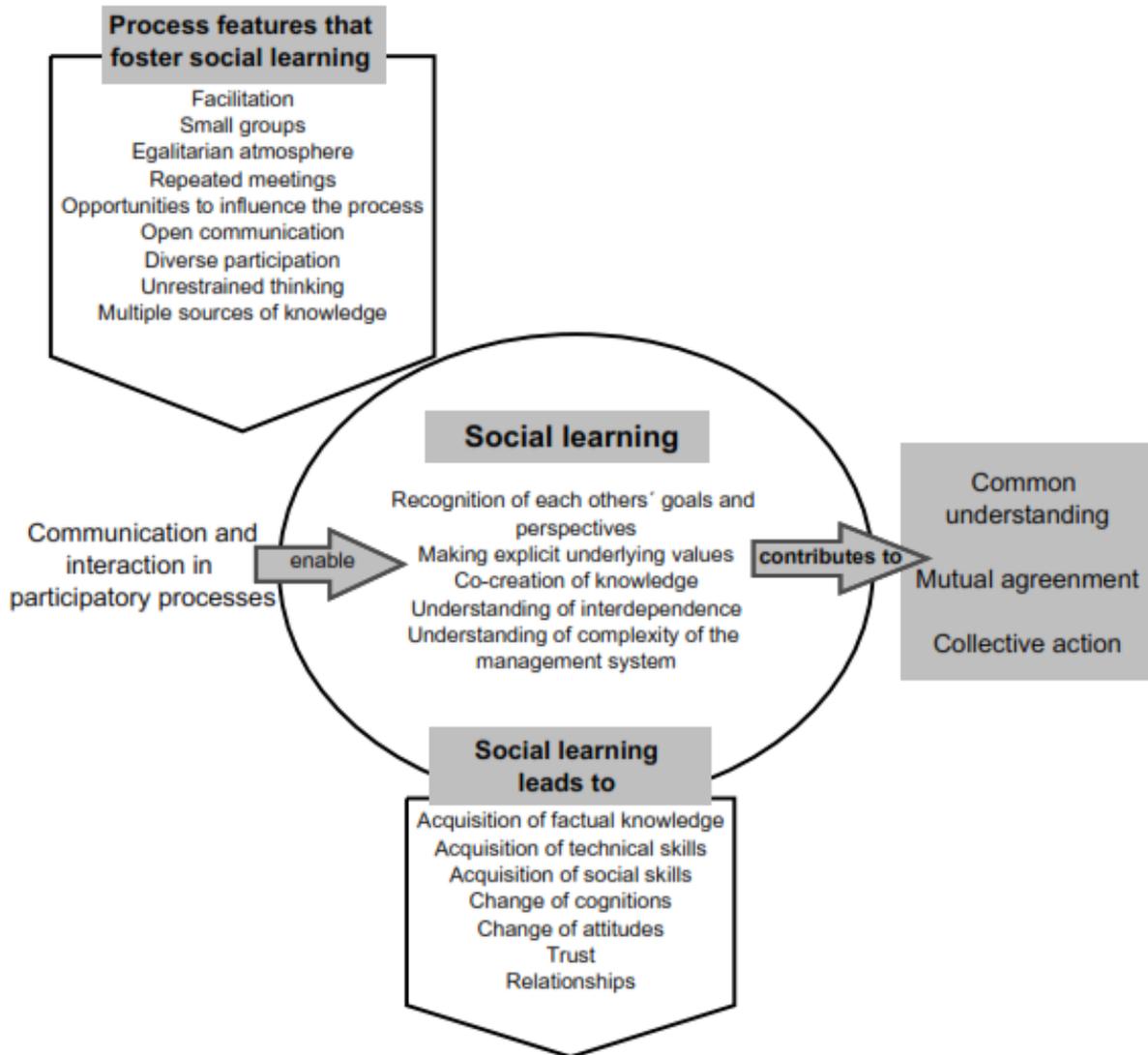


Figure 4: Social learning model. Source (Muro 2006)

Some evaluation parameters to assess learning goals and actions are (Plummer & Armitage 2007): (i) Shared actions are undertaken; (ii) Modifications are made in an on-going process of reflection; (iii) Fixing errors form routines (single-loop learning); (iv) Correcting errors by reframing (double-loop learning); (v) Correcting errors by transforming (triple-loop learning).

A social learning approach can be incorporated into M&E system. Incorporating social learning principles and practices in a M&E process can promote collective action, critical reflection, and increase knowledge (Cundill & Fabricius 2009, Measham 2009). Additionally, as stated by Cundill & Fabricius (2009), a well-designed M&E system that fosters social learning should include the following parameters:

1. Encourage on-going reflection on the learning that has taken place;
2. Involve decision-makers directly in indicator selection, monitoring and analysis through a collaborative process that encourages input from multiple knowledge systems;
3. Effective learning is about practice, and monitoring should therefore feed directly into decision-making and encourage action;
4. Encourage participants to work toward an ideal, or best practice, and encourage visioning about 'what could be' alongside 'what is currently possible' through a process of collective sense making

2.2 COMMUNITY-BASED ACTIVITIES: COMMUNITY-BASED ORGANIZATIONS AND COLLECTIVE ACTION

Community-based activities are participatory, build on priorities, knowledge and capacities of local people (Reid et al. 2009). They empower¹ the community by allowing them to define their problems, as well as design and implement the correspondent responsive measures (Bernard et al. 2008).

2.2.1 Community-based organizations

Community-based organizations (CBO) are local level institutions, or organized groups involved in development activities. CBOs are composed of members seeking to improve their livelihood through collective action (Place et al. 2002). They differ from traditional organizations in having legal status and formal membership. CBOs fulfil three main functions: provide services when markets fail, club goods² or public good when state fails, and voice in political affairs (Bernard et al. 2008).

CBOs include those having a long and enduring past, such as clan-based groups, or more recently organized groups formed with a specific purpose, such as marketing, farmer training, natural resource co-management, or income generation (Butler & Mazur 2007). All forms are relevant at attaining more sustainable livelihoods. For this, most common activities are related with animal husbandry, horticulture, marketing, and rotational credits for their

¹ Increased capacity and capability of individuals or communities to participate effectively in their own development (Papineau & Kiely 1996)

² Club good are public goods that are excludable but non-rival. In other words, i) certain people can be excluded from the consumption, and ii) one person's consumption does not diminish another person's consumption (Cornes & Sandler 1996)

members (Place et al. 2002). Depending on the operational style of the CBOs, they can support capacity strengthening by encouraging participation and empowerment, inclusiveness, decision-making by consensus, and decentralization (Butler & Mazur 2007). In many occasions, these forms of organization also provide public goods or a safety net for their members, through food banks or the accumulation of financial resources by the commercialization of their products (Bernard et al. 2008). CBOs rely on three sources of funding: (i) members fees, (ii) funds generated by the group activities, and (iii) resources obtained by external actors. For the farmer groups to support income generation activities of their members, they may engage in community-based activities.

In general, CBOs are high dependent on the community context on which they evolve (Bernard et al. 2008). Besides, their success and sustainability depends on the attributes of the CBO structure and functioning.

2.2.1.1 CBO structure

The structure of an organization generally refers to constructed frameworks and patterns of organisation, which constrain or direct human behaviour (Bilton et al. 1996). The structure of an organization should serve the organization's functions and goal (Swanson et al. 1998). The structure of a CBO is related to the roles, responsibilities, rewards, and punishments for the members. Each member in the CBO occupies a position, and there is a pattern of relationships among positions, which gives the group the organizational base to participate (Anandajayasekeram et al. 2008).

CBO structure features of a successful organization are (Anandajayasekeram et al. 2008):

- Leaders chosen to guide;
- Clearly stated objectives and work plan;
- Decision-making process should be transparent and involve actively all members;
- Maintenance of clear records;
- Well-planned and effectively managed meetings;
- Compliance of norms and rules

Leadership is very important, as the success and sustainability of any CBO depends mainly on the attributes or qualities of the leaders chosen to guide it (Anandajayasekeram et al. 2008). Anandajayasekeram et al. (2008) describe some leadership problems as: (i) take up leadership positions for self-gain; (ii) lack leadership knowledge and skills; (iii) fail to motivate followers; (iv) abusing their authority; (v) or absentee leaders—not always available to the people.

2.2.1.2 CBO functioning

The functioning or performance of a CBO is defined based on its effectiveness at serving their members. Benefits have two components; 'soft' such as training and information, and 'hard' such as providing members access to credit, inputs, or infrastructure (Place et al. 2002, Bernard et al. 2008). On the other side, there are short-term and long-term benefits. Short-term benefits are characterized by the access to credit and saving, and the creation of networks that facilitate information flow. Usually short-term benefits are individual (Weinberge & Jutting 2001). Long-term benefits can be collective or individual. Individual or household benefits are those that increase income or productivity, while collective benefits arise through the creation of markets and other income-generating activities (Weinberge & Jutting 2001).

To participate in a CBO or be engaged in community-based activities, the individual has an interest both as beneficiary of a collective action and as contributor to the common project (Weinberger & Juetting 2001, Anandajayasekeram et al. 2008). Each actor will have to weight his interest as beneficiary against those as a contributor. Table 4 describes the costs and benefits of an individual of participating in CBOs.

Costs of participation occur when the CBO is founded, the annual fees, and when a project is implemented (Weinberge & Jutting 2001). Another cost of participating in a CBO is the opportunity cost, established as the time taken from activities that secures family livelihood, like household work, agricultural and livelihood work burden (McAlistrer 2001).

Table 4: Overviews of costs and benefits from participating in CBOs

	DIRECT	INDIRECT
Sunk cost	CBO functioning (time)	Overcoming resistance of household members
Permanent cost	Membership fees, time or opportunity cost	Other household members' time for taking over activities otherwise carried out by the participating member
Immediate benefits	Provision with credit, saving facilities, creation of networks and others	Creation of networks
Long-time benefits	Increase in income or productivity Creation of markets and income-generating activities	Safety net or insurances

Source: Weinberge & Jutting 2001

Factors reflecting the ability of a CBO of generating benefits include (Place et al. 2002):

- Contribution by members;
- Violations of rules;

- Major conflicts;
- Ratification of formal rules;
- Decision-making procedures.

2.2.2 Collective action

Collective action is recognized as a positive force for rural development in Africa (Place et al. 2002). The ability of societies to adapt is partly determined by their ability to act together (Adger 2003). Getting and acting together allows to better cope with risk, as it also empowers individuals (Place et al. 2002). There are many different definitions of collective action in the literature; the most prominent are reviewed in Table 5. What all have in common is that collective action requires (Meinzen-Dick et al. 2004):

- Involvement of a group of people;
- Shared interest within the group of people;
- Common action which work in pursuit of that shared interest;
- This action should be voluntary.

Table 5: Definition of collective action

AUTHOR	DEFINITION
Sandlers (1992), p.1	“Collective action arises when the efforts of two or more individuals are needed to accomplish an outcome”
Sandlers (1992), p.19	“The study of collective action examines the factors that motivate individuals to coordinate their activities to improve their collective well-being”
Ensminger (1992), p. 22	“Collective action arises when individuals join together to work for a collective good ”
Giddens (1997), p. 581	“Action undertaken in a relatively spontaneous way by a large number of people assembled together in a particular place or area. One of the most important forms of collective action is crowd behaviour. In crowds, individuals can seek to achieve objectives which in ordinary circumstances are denied to them”
Marshall (1998)	"action taken by a group (either directly or on its behalf through an organization) in pursuit of members' perceived shared interests"
Vermillion in Meinzen-Dick, Knox, Di Gregorio (2000)	“... coordinated behaviour of groups toward a common interest or purpose”

Source: (Capri 2011)

According to Agrawal (2001) and Araral (2009), collective action is affected by: (i) the characteristics of the system resources, (ii) the characteristic of the group of people dependent on resources, (iii) the institutional arrangement of the group of people, and (iv) the interrelations. Figure 5 summarizes and lists the most important aspects under these four categories.

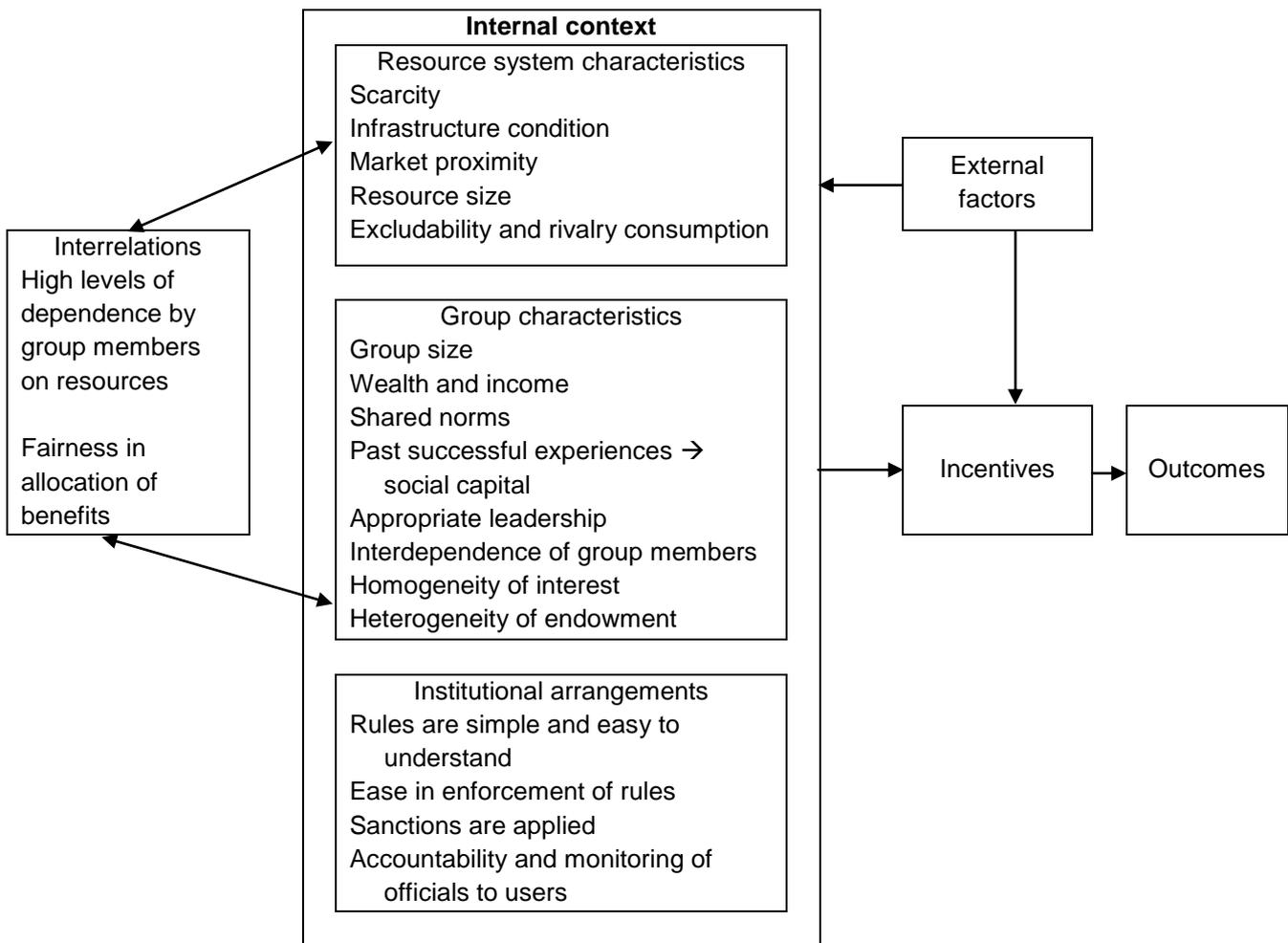


Figure 5: Factors that influence collective action outcomes in a common pool resource. Modified form (Agrawal 2001, Araral 2009)

Collective action can take place directly by members of a group through a formal organization (Meinzen-Dick et al. 2004). Networks and flows of information between individuals and groups is required to permit a decision-making process that enables collective action (Adger 2003). In the context of this research, what makes collective action important is that it helps regulate the acquirement of benefits in community-based organizations (Meinzen-Dick et al. 2004), and in this way is related with the outcome of community-based activities.

2.2.3 Social capital

The debate on social capital has brought together sociologist, anthropologist, political scientists, and economist. There are several different definitions of social capital, which are shown in Table 6. Here it will be considered as “an attribute of individuals and their relationships that enhance their ability to solve collective action problems” (Ostrom & Ahn

2003). It captures the idea of social bonds and norms, being a resource available to members of a social network (Pretty & Ward 2001, Ostrom 2009). Social capital decreases transactional costs of working together, facilitating cooperation (Pretty 2003).

Table 6: Definitions of social capital

AUTHOR	DEFINITION
Lyda Judson Hanifan (1920), p. 22	"... that in life what tends to make these tangible substances count for most in the daily lives of people; namely, goodwill, fellowship, sympathy, and social intercourse among the individuals and families that make a social unit"
Glenn Loury (1992), p. 100	"... naturally occurring social relationship among persons which promote or assist the acquisition of skills and traits valued in the marketplace"
Pierre Bourdieu (with Wacquant, 1992), p. 19	"Social capital is the sum of resources, actual and virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition"
James Coleman (1994), p. 302	"Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: they consist of some aspects of social structure, and they facilitate certain actions of individuals who are within the structure"
Robert Putnam (1993), p.169	"... features of social organizations, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated action"
Burt (1992), p.9	"... friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital"
Nahapiet and Ghoshal (1998), p. 243	"... the sum of the actual or potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital comprises both networks and assets that may be mobilized through the network"
Wookock (1998), p. 153	"... the information, trust and norms of reciprocity inherent in one's social network"
Ostrom (1999)	"The shared knowledge, understandings, norms, rules, and expectations about patterns of interactions that groups of individuals bring to a recurrent activity"
Ostrom and Ahn (2003), p. xiv	"... social capital is an attribute of individuals and their relationships that can enhance their ability to solve collective action problems"
Adler and Kwon (2002), p.23	"Social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its efforts flow from the information, influence and solidarity it makes available to the actor"

Source: Adapted from Ostrom 2009, p. 3

There are four central aspects of social capital: (i) relationships of trust, (ii) reciprocity exchange, (iii) common rules, norms and sanctions, and (iv) connectedness, networks and groups (Pretty & Ward 2001). These are particularly important in the study of collective action. According to Ostrom and Ahn (2003), trust, as a form of social capital, is the most

inclusive factor in facilitating collective action, while the other forms contribute by increasing trust (Figure 6).

Trust takes time to build and is easily broken (Pretty & Ward 2001, Pretty 2003). It reinforces norms and reciprocity (Pelling & High 2005). Reciprocity, or the simultaneous exchange of goods and knowledge, increases trust (Pretty & Ward 2001, Ostrom & Ahn 2003, Pretty 2003). Common rules, norms, and sanctions are mutually agreed; sanctions ensure that those who are breaking the rules know they will be punished (Pretty & Ward 2001, Ostrom & Ahn 2003, Pretty 2003). Connectedness may be related to: (i) bonding capital or people with similar objectives, as in farmer groups; (ii) bridging capital or the capacity of such groups to make links with others with a different view; and (iii) linking capital or the capacity to engage with external agencies or groups (Pretty & Ward 2001, Pretty 2003, Pelling & High 2005). Strong bonding ties are associated with survival more than with development (Pelling & High 2005).

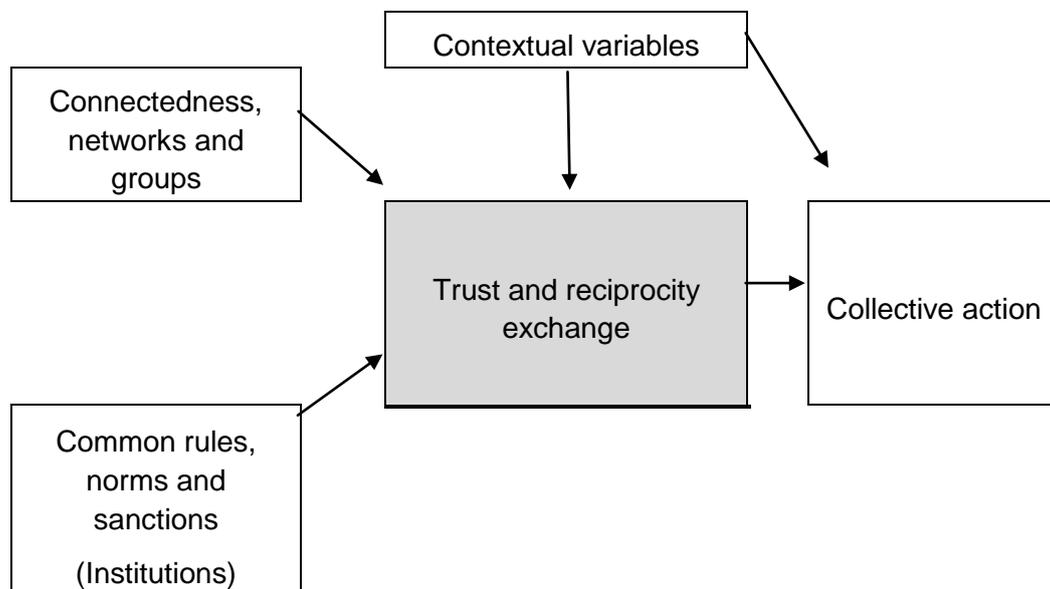


Figure 6: Social capital forms and their entailment with collective action. Source (Ostrom & Ahn 2003)

Related to climate change, it has been argued that social capital can be mobilized to bring material adaptations (Adger 2003, Pelling & High 2005). This is only one focus of how social capital can be used to enhance the adaptive capacity³ of communities. Figure 7 presents

³ The ability of a system to adjust to moderate potential damages, to take advantages of opportunities, or to cope with the consequences. Adaptations, or changes in the system to better deal with problematic exposures and sensitivities, reflect adaptive capacity (Smit & Wandel 2006). The capacities in a society that enable self-protection and collective action to prevent or cope with stressors (Pelling & High 2005)

four different possibilities to create or increase adaptive capacity to climate change through social capital (Pelling & High 2005):

- (i) Mobilise existing social capital to generate material interventions directed to reduce material vulnerability to climate change;
- (ii) Education to increase resilience to future risk;
- (iii) Activate latent social capital to generate enhanced access to resource for future interventions;
- (iv) Vote, or taking part of collective decision-making.

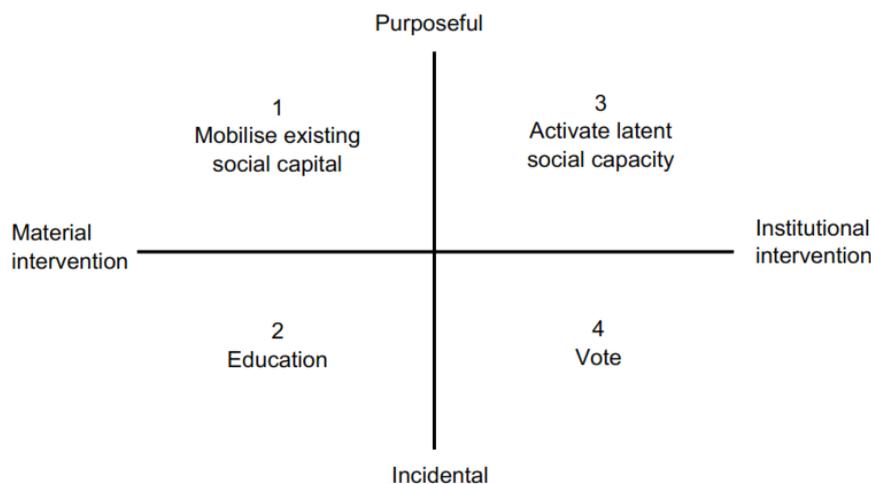


Figure 7: Possibilities to create or increase adaptive capacity through social capital. Source (Pelling & High 2005)

With this integrated view, adaptive capacity is understood as the capacities in a society that enable self-protection and collective action to prevent or cope with stressors (Pelling & High 2005). At the same time, social learning scholars recall the role of social capital in understanding the adaptive capacity behaviour in communities of practice (Pelling & High 2005). Hence, social learning is assumed to occur at two, or three, levels (Pahl-Wostl et al. 2007):

- On short to medium time scales at the level of processes between collaborating stakeholders in collaboration processes;
- On medium to long time scales at the level of change in actor networks (possible outcome/ feedback of processes); and
- On long time scales at the level of change in governance structure (formal and informal institutions; cultural values, norms, and paradigms).

2.3 LOW EXTERNAL INPUT AGRICULTURE

2.3.1 Farming systems in Southern Africa

A *farm system* is composed of the household, its resources, the resources flows, and interactions (Dillon, Dixon et al. 2001). A *farming system* is defined as the population of individual farm systems that have broadly similar resource based, enterprise patterns, household livelihood, and constraints, and for which similar development policies are appropriate (Dixon et al. 2001). Farming systems can be delimited based on (i) natural resources; (ii) dominant livelihoods; (iii) degree of crop-livestock integration; (iv) scale of operation.

Based on these criteria, Dixon et al. (2001) delimited the main farming systems of the developing regions across the world. For the sub-Saharan region 15 farming systems were identified (Figure 8), from which the predominant in the studied area are (Dixon et al. 2001):

- Cereal-root crop mixed: Intercropping is common, crops grown vary from are millet, sorghum, maize, cassava, yams, legumes, and cattle. The main source of vulnerability is drought.
- Maize mixed: The most important farming system of Southern Africa. The main staple is maize, and the main cash sources are remittances, cattle and small ruminants, and sale of food crops. Cattle are kept for ploughing, wealth, and savings. The main sources of vulnerability are drought and market volatility.

Alternatively, Seré et al. (1995) developed a livestock based production system classification. In the study region, the prevalent production system is mixed rainfed arid and semi-arid tropic and subtropics (MRA) system. The MRA system is characterized by (Seré et al. 1995):

- The vegetation growth period is no longer than 180 days, where the main restriction is primary production of the land due to low rainfall;
- The more severe the constraint the greater is the importance of livestock in the area;
- Grazing land not suitable for crop production is the main feed source for livestock, which in most of the cases is community owned;
- Crop production is mainly for subsistence, usually produced extensively with minimal inputs;
- Livestock have a range of roles in the system, including animal traction, production of manure, cash reserve and provision of meat and milk;
- The major concern is related with the degradation of resources

Livestock are integral part of the agricultural systems in Africa, contributing to the livelihood of the poor and insecure in many ways (Delgado et al. 2001). They are an important source of cash income, and offer risk management option to reduce vulnerability (Delgado et al. 2001). In the semi-arid mixed crop systems of Southern Africa, cattle are of greater importance, followed by goats (Perry et al. 2002).

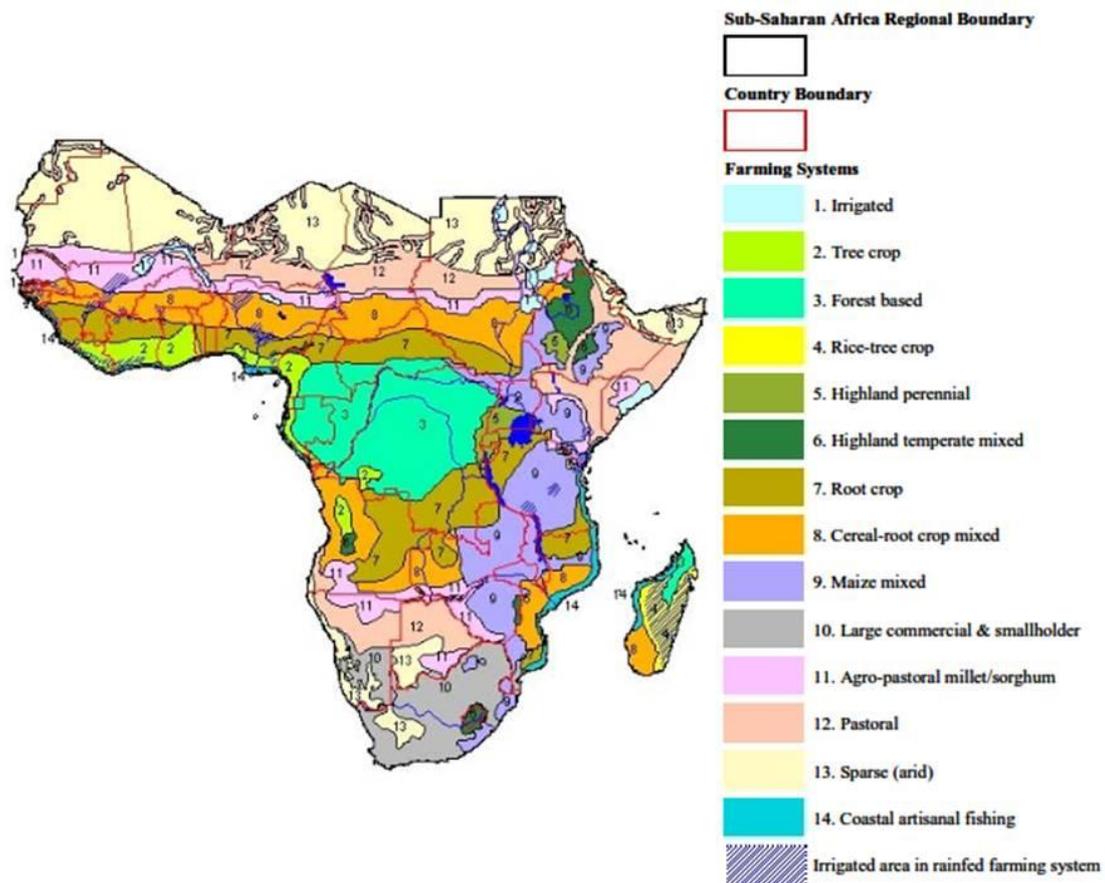


Figure 8: Major farming system in Sub-Saharan Africa. Source: (Dixon et al. 2001)

2.3.2 Farming system characteristics in less-favoured areas

Roughly 40% of the developing world's rural population lives in less-favoured areas (Van Keulen 2006). These areas are characterized by having either (i) low agricultural potential because of limited and uncertain rainfall, poor soils, steep slopes, or other biophysical constraints; or (ii) higher agricultural potential, but limited by socio-economic constraints like access to infrastructure and markets (Dixon et al. 2001, Van Keulen 2006). In brief, smallholder farming systems are characterised by having low resources in terms of: (i) land; (ii) capital; (iii) income; and (iv) poor food security (Dixon et al. 2001). Besides, it is common to find diversified agriculture and some off-farm activities, mostly informal, to supplement household incomes (Dixon et al. 2001).

Livelihood and farming systems of these less-favoured areas are usually characterized by heterogeneity in resource use by farmers and fields, and high levels of spatial and temporal variability in yields and income (Van Keulen 2006). Heterogeneity can be created by the own farmer by crop, soil and / or livestock management (Van Keulen 2006).

Specific agro-ecological and socio-economic conditions that prevail in these areas are (Van Keulen 2006):

- Low agricultural yields;
- High risk that discourage farmers to specialize, leading to risk aversion in input and investment behaviour; reducing crop losses from pests and disease and making more efficient use of farm labour;
- Degradation of natural resources and deterioration of soil physical properties, soil erosion, and nutrient depletion.

Uncertainty and risk go hand by hand in farming system (McConnell & Dillon 1997). Subsistence and semi-subsistence resource-poor small farmers are characterized by using several strategies for risk aversion (McConnell & Dillon 1997). Being resource poor and depending on their own production means to be at risk of malnutrition, starvation or death if the production fails.

Uncertainty is defined as imperfect knowledge, and is a function of time: further the future, greater the uncertainty (McConnell & Dillon 1997). It is relevant regarding the decision-making on planning and running the farm, or farm management (McConnell & Dillon 1997).

Uncertainty is always present, but on the other hand, risk is only present when the uncertain effect of a decision is viewed by the farmer as worth to worry about (McConnell & Dillon 1997). These risks may come from the external environment or from the farm processes (McConnell & Dillon 1997). Because of the dependency of agriculture on the natural resources, the risks associated with them are the more important, mostly those related with weather (short term) and climate (long term, change in patterns) (McConnell & Dillon 1997). Although risk associated with the social environment are generally not perceived as high, in the study area, change in traditions may come with an important source of risk (Dube & Sekhwela 2008). To exemplify, some past strategies that helped cope with climate variability are (Brouwer & Nhassengo 2006, Dube & Sekhwela 2008):

- Traditional decision-making institutions, that secured access to land for females and the poorer households.
- The bride price reduced the possibility for development of poor female-headed households;

- The herding system, in which livestock owners loan their livestock to poor families whom take care of the livestock and in exchange use the animal for labour and milk, plus a payment depending on the health of the animals or the increase of the herd;
- Work in someone's land in exchange for ploughing;
- Outplace of cattle to a relative or friend, to reduce risk. In exchange, the friend or family member can milk the animal or use it for traction or ploughing.

Weathered the source of risk, smallholder farmers adopt various strategies to reduce or mitigate it. These strategies are mostly related to production or yield risk (McConnell & Dillon 1997). Furthermore, for farmers that behave in a risk averse way, maximization of profit is no guiding principle, on the contrary pursuing utility maximization (McConnell & Dillon 1997). Resilience to the risk associated with climate variability can be built by insurance mechanisms, which can in turn reduce the vulnerability of people to climate variability (McConnell & Dillon 1997).

Vulnerability, on the other hand is considered to be the ability or inability of people or social groups to respond (cope, recover or adapt) to any external stress on their livelihoods (Kelly & Adger 2000). In this perspective, vulnerability of a group is determined by the availability of resources and the capacity of the group to use them (Kelly & Adger 2000).

Davies (1993) distinguishes between coping mechanism and adaptive strategies based on the risk, as summarized in Table 7. Coping mechanisms are used by secure livelihood system during period of stress, while adaptive strategies are characteristic of vulnerable socio-ecological systems, and constitute a permanent change in the rules to meet the livelihood (Davies 1993).

Table 7: Characteristics of coping and adaptive mechanism

CHARACTERISTICS	COPING MECHANISM	ADAPTIVE STRATEGIES
Time	Short-term Reactive, <i>ex post</i>	Long-term Anticipatory, <i>ex ante</i> , or Reactive, <i>ex post</i>
Cause	Locally or externally induced	Locally or externally induced
Space	Acting within the prevailing rule system	Changing the prevailing rule system
Efficiency	Short-term	Long-term
Resilience	Reversible in short-term	Sustainable. Difficult to reverse

Source: (Davies 1993)

2.3.3 Smallholder agriculture and climate change

The effects of climate change are expected to be harmful to agriculture, were warming and drying in tropics and subtropics may reduce crop yields in 10% to 50% to 2050 (Jones & Thornton 2009). Precisely, in MRA (mixed rainfed arid-semiarid) systems failure rates are projected to increase from 18% to 30%, depending of the scenario (Jones & Thornton 2009). Here, maize cultivation will no longer be possible; therefore, rural people need to change their livelihood strategies to maintain food security and income generation (Jones & Thornton 2009). These effects will be stronger in places with reduces accessibility, were livestock provide an alternative (Perry et al. 2002, Jones & Thornton 2009). Adaptation to climate change is critical, particularly in areas where vulnerability and poverty is high, as in the study area.

Adaptation is also a tricky term. It comes from biology and evolution, and was originally defined as the evolutionary process whereby a population becomes better suited to its habitat, leaving fertile progeny. In the context of climate change, there are several definitions of adaptation, all of which describe it as anticipatory or preventative (Table 8). In the Intergovernmental Panel on Climate Change, it is defined as the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (Smit & Pilifosova 2001).

Table 8: Definitions of adaptation in the context of climate change

AUTHOR	DEFINITION
Burton 1992	The process through which people reduce the adverse effects of climate on health and their well-being, and take advantage of the opportunities that their climatic environment provides
Smit (1993)	Involves adjustments to enhance the viability of social and economical activities and to reduce their vulnerability to climate, including its current variability and extremes events as well as longer term climate change
Stakhiv (1993)	Any adjustment, weather passive, reactive or anticipatory, that is proposed as a means for ameliorating the anticipated adverse consequences associated with climate change
Smit et al (1996)	Includes all adjustment in behaviour or economic structure that reduce the vulnerability of society to changes in the climate system
Waston et al (1996)	The degree to which adjustments are possible in practice, process, or structures of systems to projected or actual change of climate. Can be spontaneous or planned, and can be carried out in response to or in anticipation of change in conditions

Source: (Smit et al. 2000)

On the other hand, adaptation can be describe as a “co-evolution” process of mutual interactions, which in human social systems can be seen as the process of learning and development (Ison et al. 2007). This will entail a change of ‘adaptation to’ to ‘adaptation with’ (Collins &), which requires new approaches that engage all the actors involved in the topic of climate change. As a response, social learning approach emerge as a system for integrated and adaptive concerted actions (Collins & Ison 2009a).

The impact of climate change will be felt particularly by resource-dependent communities. Therefore it is important to learn from past and present adaptation strategies to understand both the process by which adaptations take place and the limitations of the agents of change (Adger 2003). Better understanding of how farmers have developed coping strategies, why they do what they do, and the constrains they face, is essential for policy making to enhance adaptability (Kaufmann 2011).

Recently, several studies performed in Africa have captured famers’ perception of climate and the strategies considered suitable for adapting (Hassan & Nhemachena 2008, Deressa et al. 2009, Gbetibouo et al. 2010). The results from these studies coincided in that the majority of the farmers perceived that temperature is warming and precipitation declining, the timing of rains has changed, and droughts are more frequent (Hassan & Nhemachena 2008, Deressa et al. 2009, Gbetibouo et al. 2010). The adaptation strategies perceived by farmers’ as priority include (Hassan & Nhemachena 2008, Deressa et al. 2009, Gbetibouo et al. 2010):

- Crop diversification;
- Using different crop varieties;
- Varying the planting and harvesting dates;
- Increase the use of irrigation;
- Increase the use of water and soil conservation techniques;
- Shading and shelter;
- Crops with shorter vegetation cycles;
- Diversifying of income generation activities

Farmers state they have varied their production system in order to adapt by (Hassan & Nhemachena 2008):

- Diversify into multiple crops and use mix crop-livestock systems;
- Vary planting dates;
- Use different crop varieties;
- Practice soil and water conservation techniques

Besides, Hassan & Nhemachena (2008) found that greater farming experience promotes adaptations. In additions, farmers that have not undertake any adaption strategy attribute this to lack of information (Deressa et al. 2009). Both Hassan & Nhemachena (2008) and Deressa et al. (2009) found in their studies that education and farmer-to-farmer learning are prevalent condition to enhance the adoption of adaptation strategies among farmers. As it, to stimulate farm-level adaptations policy measures should focus on education programmes, in which farmers become aware of the potential benefits of adaptations.

3 MATERIALS AND METHODS

3.1 STUDY REGION AND SYSTEM

The area of study of the present research is located in Mabalane District of Gaza Province, Mozambique (Figure 9). The work was done with two CBOs, one in the village of Mabomo and the other in the village of Mungazi. Mabalane district has a population of 25.464 individuals (Brito et al. 2009). This region is strategically located, with the train railway passing through it, from Maputo to Zimbabwe, which enables the trade of commercial products and charcoal.

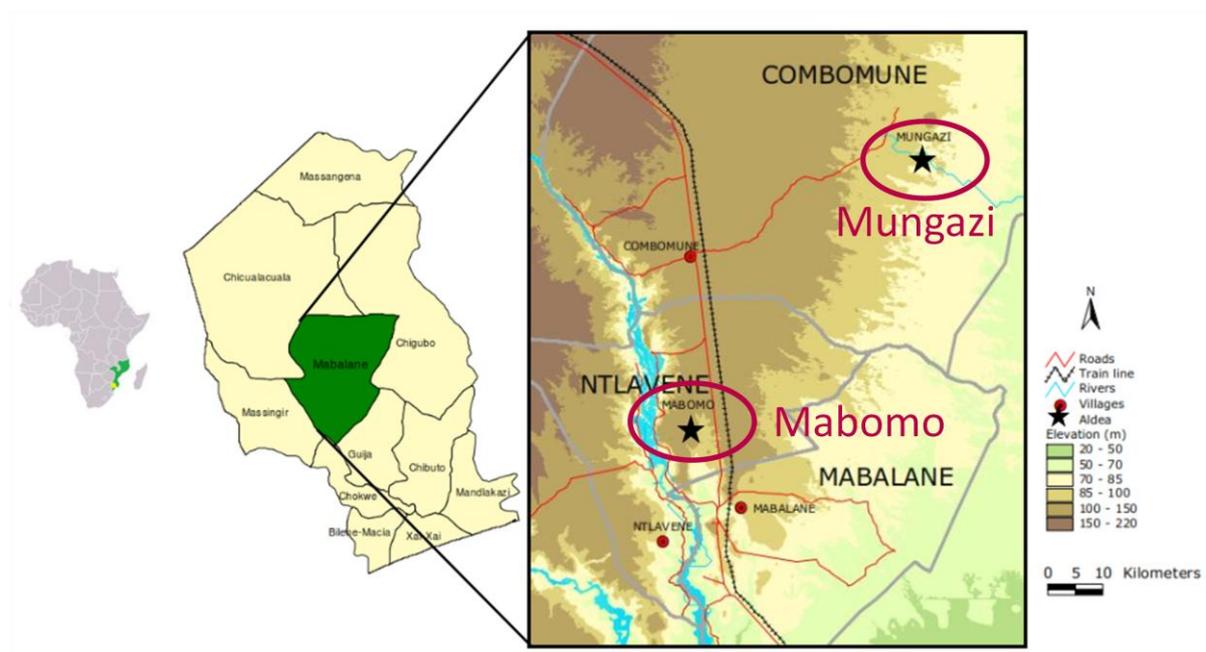


Figure 9: Map of the study area. Source (Ara-Sul 2002)

3.1.1 General conditions

Gaza Province area experiences year-to-year variability in rainfall (Usman & Reason 2004). The Limpopo River Basin, more exactly Mabalane District of Gaza Province, is characterized by having an annual precipitation of 400-600 mm (Siteo 2005, Brito et al. 2009). During the rainy season, from October to March, the precipitation varies between 361-470 mm and temperatures vary between of 21 a 33 °C (Brito et al. 2009). During the dry season, from April to September, the precipitation varies from 30 to 120 mm, with a temperature of 15 a 28 °C (Brito et al. 2009).

Livelihood in the study area is centered on subsistence farming, with production of cattle, goats, chicken and pigs and mostly rainfed cultivation. Local land use systems have evolved to accommodate this variability. People are dependent both directly and indirectly on the

surrounding natural resources, and consequently their livelihoods are closely connected to the variability and productivity of the natural resource base (Brouwer & Nhassengo 2006).

The impact of extremes, such as the flooding in 1977 and 2001 (Brouwer & Nhassengo 2006), or droughts in 1983-1984, 1994, 2003 (Usman & Reason 2004), caused livelihood disruption. According to Osbahr et al 2008, rural population in the Gaza province in Mozambique is reliant on traditional coping mechanisms of reciprocity and exchange. Local responses to cope with climate disturbances include diversification and collective land-use management (Osbahr et al. 2008).

Forecasts for Southern Mozambique envisage an increase in the intensity of rainfall, mostly in the form of erratic rains (Cook et al. 2004), with an increase probability of dry years (Usman & Reason 2004). By 2025, annual average precipitation is expected to decrease between 10-15%, and temperature increasing between 1.75-2.25 °C in summer and 1.25-2 °C in winter (Ragab & Prudhomme 2002). Moreover, the Mozambique vulnerability assessment committee of the “Famine Early Warning System Network” foresees low crop production because of low rainfall at critical flowering period for maize (FEWS.NET 2011).

3.1.2 Livelihood and farming systems

Gaza provinces show as much as 50% of the households being headed by women, given the traditional migration of labour to South Africa (De Matteia et al. 2006). At the same time, the production in the province is the lowest compared with the rest of the country and remittances pay an important role, being higher than in the rest of the country (Brouwer & Nhassengo 2006, De Matteia et al. 2006). Access to remittances and risk reducing mechanisms has made most households in the Limpopo valley resilient to major shocks, such as the 2000 floods (Brouwer & Nhassengo 2006). These mechanisms allow households to obtain a regular income regardless of local circumstances.

Rural households diversify out of agriculture into a variety of income-generating activities to cope with risk and uncertainty (Cunguara et al. 2011). Besides agriculture, charcoal production and wood cutting, are predominant in the area (Brito et al. 2009). Simultaneously, hunting and gathering are important activities in the province, with higher levels than in other provinces (De Matteia et al. 2006). Livestock, both cattle and small ruminants play also an important role in the livelihood of the province with average numbers higher than in the rest of the country (Brouwer & Nhassengo 2006, De Matteia et al. 2006).

3.1.3 Villages

The selection of the villages was done based on: (i) absence of CBOs in the village; (ii) not target before by a development programme; (iii) motivation to form a CBO and engage in

collective activities; (iv) receptivity of village leader; (v) village not scattered, but grouped together (vi) accessibility (near/far) to river and market (Levy 2010). Table 9 compares the most important issues from both villages.

Mabomo

The village of Mabomo is located on the margins of the Limpopo River at a distance of 30 km from the District's headquarter, Mabalane (see Table 9). The village consists of 110 agro-pastoralist families, and a population of 1046 individuals (Levy 2011). It is connected with the District's headquarter, Mabalane, by public transport offered twice a week.

The 'Mozambique baseline livelihood report' from FEWS.NET (2011) categorizes the production system in Mabomo as maize subsistence agriculture. Only better-off households have cropping plots near the river plains, which present soil of better quality. The main wealth of the area is livestock, especially cattle and goats. The main constraint that limits the possession of animals is the lack of cash to invest, and the pressure to sell animals to buy food. The main cash income is from charcoal production, and remittances from family members working in South Africa.

Mungazi

The village of Mungazi is located in the buffer zone of the Bahine National Park, at a distance of 100 km from the District's headquarter (see Table 9). The village consists of 80 households, and a population of 235 (Levy 2011). There are no public transport connections between the Mungazi and the village. Therefore, the movement of goods and people is limited.

Economic activities are agriculture, livestock keeping, self-employment in charcoal production and migration to work in South Africa (FEWS.NET 2011). Agricultural activities rely on the rainy season, from October to March. Low rainfall amount and sandy soils with poor water retention capacity, have led households to grow sorghum (FEWS.NET 2011). As in Mabomo, the main wealth of the area is livestock, especially cattle and goats (FEWS.NET 2011). The main constraint that limits the possession of animals is the lack of cash to invest, and the pressure to sell animals to buy food. The main cash income is from charcoal production, and remittances from family members working in South Africa.

3.2 STUDY CONTEXT

The here presented research in this master thesis is part of the collaborative project funded by BMZ "Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach". The goal of the project is to increase the adaptive capacity of agro-pastoralists, who are one

of the most vulnerable groups in Africa to climate variability and the expected effects of future climate change (DITSL 2011).

Table 9: Characterization of the villages

	VILLAGE OF MABOMO	VILLAGE OF MUNGAZI
Village size*	110 households	80 households
Population	1046 individuals	235 individuals
Distance to town	30 km form Mabalane	100 km from Mabalane
Production*	Agricultural production is based on maize, beans, peanuts, and pumpkins. Also is produced watermelon, tomatoes, and sweet potatoes. Livestock keeping is characterized by cattle and goat rearing, and in a fewer extent pig and sheep rearing.	Agricultural production is based on millet, sorghum, maize, beans peanuts, pumpkin, and watermelon for self-consumption. Livestock keeping is characterized by cattle and goat rearing, and in a fewer extent pig and sheep rearing.
Social homogeneity / heterogeneity	Same ethnic group Hierarchical social structure by traditional leaders	Same ethnic group
Vulnerable socio-economic context *	Constrained agricultural production; Post-war process of herd repopulation; Dependency on structural and aid program; Reliance on off-farm alternative livelihood activities.	
Environmental risk**	Inundations; Low and unpredicted rainfalls; Crop pest; Livestock diseases; Violent storms; Wild animals.	Malaria; Poor soil; Low and unpredicted rainfalls; Crop pest; Livestock diseases; Wild animals.
Coping strategies**	<u>Very poor and poor families:</u> (i) Selling livestock, specially goats, and in extreme circumstances cattle; (ii) Increase their production and sales of charcoal and wood extraction; (iii) Males travel to South Africa searching for jobs. <u>Middle and better-off families:</u> (i) Selling livestock; (ii) Small-scale trading activities; (iii) Renting oxen	(i) Increase search and consumption of wild food; (ii) Intensification of self-employment activities such as charcoal production; (iii) Increase livestock sales; (iv) Increase food purchase
Development priorities**	Potable water; Oxen for traction; Food commercialization; Agricultural projects; Animal vaccination campaigns	Market development; Potable water; Oxen for traction; Agricultural projects; Animal vaccination campaigns

Source: *Levy 2010, **(FEWS.NET 2011), personal observations

To begin a collaborative learning approach, two CBOs were formed at the beginning of 2010 in two different villages in the Gaza province of Mozambique (Figure 9). Both CBOs have their statutes officially registered, and a bank account opened. An important guiding focus of the CBOs was empowerment through collective action and social learning (Levy 2010). For a summary of the main aspects of the structure of the CBOs in Mabomo and Mungazi, see Table 10.

Since the formation of the CBOs, they have been part of a facilitation process of (i) production of specific CBO objectives (Table 12); (ii) action plan for community-based activities (iii) organization of meetings and record keeping; and (iv) knowledge exchange with zonal research institutes (Levy 2011).

Table 10: Structure of the CBOs in Mabomo and Mungazi

	CBO IN MABOMO	CBO IN MUNGAZI
Activities	Animal husbandry	Revolving loan scheme
Objectives*	Empowerment through exchange of knowledge and experiences	Empowerment through exchange of knowledge and experiences
Active since	2010	2010
Size	18 members	20 members
Legal constitution	Yes	Yes
Board of director	Yes	Yes / regular members not happy
Code of conduct penalties	Yes / compliance	Yes / no clear compliance
Control commission	Fiscals	Fiscals
Decision-making	During general meetings	During general meetings / important decision taken by official members
Meetings	Once a month	Planned once a month
Accounting books	Yes	Yes
Proceeding books	Yes	Yes
Sources of founding		
- members fees	Yes	Yes
- funds generated by the CBO activities	No	No
- resources obtained by external actors	Yes	Yes

Source: own study, *Levy 2011

At the beginning of the project, each CBO received an input of 1000 Euros to be used according to the project goals. That is, in an activity that enabled the CBO members to increase their adaptive capacity to climate variability. Decision power over the use of those funds was fully in hands of the CBO members. After a facilitation process, both CBOs stated their objectives and a plan of action to use the received funds (Levy 2010). During the project period, the CBO members in Mabomo have implemented a goat keeping activity, and are currently constructing an improved corral for confined pig rearing. On the other hand, the CBO members in Mungazi have used the money in a revolving loans scheme.

Since a key component of the collaborative project “Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach” was to increase the active learning possibilities of smallholders and pastoralists (DITSL 2011), a PM&E system was planned. The intention of the PM&E system was to play a key role for the CBO members to learn about the outcome of the group activities, and to identify possible constrains or improvement options.

This research thesis provides qualitative empirical data to elucidate key elements for the successful establishment of PM&E system; support or refute the hypothesis that a PM&E system is an effective approach in supporting community-based activities; and unfold key opportunities and barriers form the CBOs to enable community-based activities.

Table 11: Specific objectives of the CBOs in Mabomo and Mungazi

CBO in MABOMO	CBO in MUNGAZI
<i>3 months</i>	
Construction of improve coral for pigs and goats; Selection and acquisition of pigs and goats; Establishment of a PM&E system	Construction of corrals; Selection and acquisition of pigs and goats; Training of veterinary promoter; Establishment of a PM&E system
<i>1 year</i>	
Period for the multiplication of animals; Acquisition and commercialization of veterinary products; Construction of the CBO headquarters	Period for the multiplication of animals; Acquisition and commercialization of veterinary products; Construction of a well for the animals; Construction of the CBO headquarters
<i>2 years</i>	
Organization of a central market for the commercialization of livestock and production form cropping field	Commercialization of goats and pigs
<i>5 years</i>	
From the resources acquired from the activities performed by the CBO, members can benefit by animal and / or revolving loan scheme.	

Source: Levy 2011

3.3 DATA COLLECTION

The field phase of the present research was conducted on rural Mozambique from April to July 2011. Because of the participatory nature of the action-research presented here, the investigation is structured as an iterative learning process with cycles of exploration, analysis, decision-making, action and reflection (Figure 10).

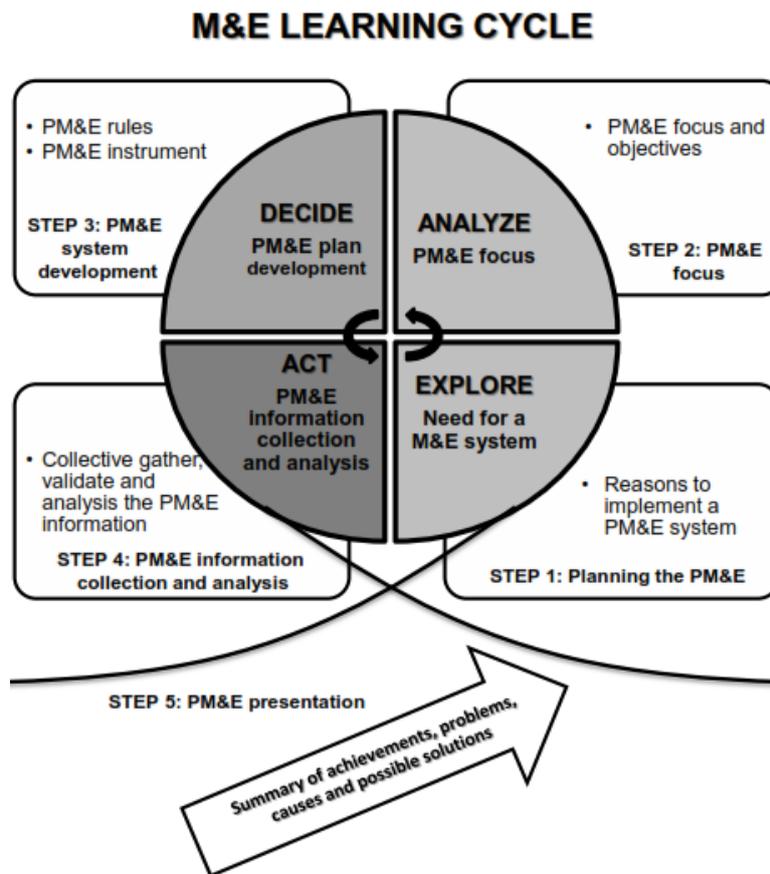


Figure 10: M&E learning cycle. Modified from Woodhill & Robins (1998)

The present research follows a qualitative approach, with a focus on the perception and experiences of CBO members in relation to PM&E system for the activities implemented. Because of the subjective nature of issues connected with learning and empowerment, these have to be captured via participants' perceptions (Blackstock et al. 2007). For this, the research draws on a series of focus groups, semi-structured interviews, workshops, and feedback meetings. Interviews, focus groups and workshops were supported with visual aids when necessary.

The duration of the interviews and focus groups was between 45 and 90 min. Each individual interview and focus group was recorded and transcribed. Guiding questions were used to maintain focus; however, these activities did not follow any formal structure and were more conversational in nature. This approach allowed interviewees and focus group members to feel comfortable and to focus primarily on the topics that they were more familiar with. Interviews and focus groups were always initiated by describing the purpose of the research, and every member was asked for permission to digitally record the activity. The interviews were performed with 11 CBO members in Mabomo (Table 12) and 10 CBO members in Mungazi (Table 13).

The data collection is divided into three components, according with the research objectives. The data collection method according to each component is shown in Table 14.

Table 12: Profile of 11 CBO members interviewed in Mabomo

CODE	INTERVIEWEE	POSITION	DATE
MA01-O	Silvano Mapande Baloi	President	19.05.2011
MA02-O	Jose Cumbulela Mundlovo	Secretary	17.06.2011
MA03-OT	Frazao Lainane Simago	Treasurer/Herder	24.05.2011
MA04-OT	Maria Mpungo Ngulele	Fiscal	18.05.2011
MA05-OT	Cristina Rafael Machava	Fiscal	17.06.2011
MA06-R	Manuel Pretoria Simango	Regular	18.05.2011
MA07-R	Inacio Simango	Regular	19.05.2011
MA08-R	Francisco Jutasse Ringane	Regular	16.05.2011
MA09-R	Frazao Papai Baloi	Regular	16.06.2011
MA10-R	Antonio Vicente Tivane	Regular	24.06.2011
MA11-R	Eduardo Sango Macamo	Regular	25.06.2011

MA: Mabomo, O: Official, T:PM&E team, R: regular

Table 13: Profile of 10 CBO members interviewed in Mabomo

CODE	INTERVIEWEE	POSITION	DATE
MU01-OT	Antonio M Chauque	Secretary	20.06.2011
MU02-OT	Piosse Samuel Chauque	Treasurer	22.05.2011
MU03-O	Albertina Chauque	Fiscal	21.05.2011
MU04-OT	Jossias Mungazi Chauque	Fiscal	19.06.2011
MU05-RT	Jotasse Matsumbane Chauque	Regular	19.06.2011
MU06-R	Paulo Pambule Chauque	Regular	22.05.2011
MU07-R	Elizabethe Chauque	Regular	22.05.2011
MU08-R	Gabriel Alfredo Chauque	Regular	19.06.2011
MU09-R	Sara Madrai Tsani	Regular	20.06.2011
MU10-R	Armando Sabão Chauque	Regular	20.06.2011

MU: Mungazi, O: Official, T:PM&E team, R: regular

Table 14: Data collection methods of the three components of the research

COMPONENT	DATA COLLECTION METHOD
Development and implementation of a PM&E system	- Focus groups - Workshops
Assessment of the PM&E system	- Semi-structured interviews
Evaluation of CBOs potential to enable community-based activities	- Semi-structured interviews

3.3.1 DEVELOPMENT AND IMPLEMENTATION OF A PM&E SYSTEM

The process of development and implementation of a PM&E system was divided in five basic steps following (Burke, Estrella & Gaventa 1998, Woodhill & Robins 1998, Cramb, R. and, FAO 2003, Slocum 2003, Geilfus 2008, Anandajayasekeram et al. 2008), as shown in

Figure 11 and Table 15. Nevertheless, because of the difference in the community-based activities and maturity of the CBOs, the process was adapted to each context. The guiding questions used for each step are shown in Table 16.

To ensure the effectiveness of PM&E, participation and collaboration, context specificity, inclusiveness, learning, flexibility, and empowerment principles were included in the methodology when designing the process (see Section 2.1.3).

The following sections will describe the procedure for each step in the development and implementation of the PM&E system: (i) planning the PM&E, (ii) PM&E focus, (iii) PM&E system development, (iv) PM&E information collection and analysis, and (v) PM&E presentation, as seen in Figure 11. Hence, the process of implementation is documented as part of the results. For detailed information on the procedure during the general meetings, workshops and focus groups refer to Appendix 1: TOOLS.

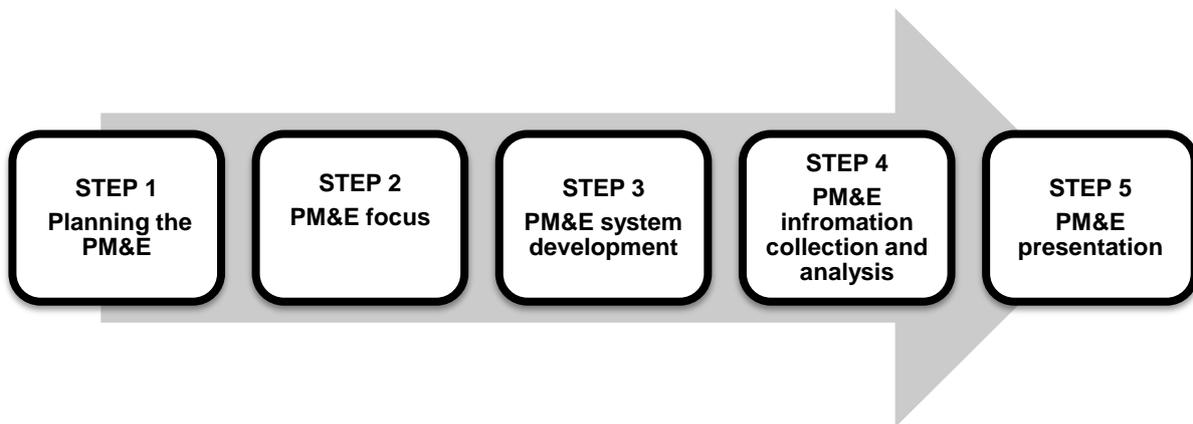


Figure 11: Steps used to develop and implement PM&E system in the CBOs in Mabomo and Mungazi

Table 15: Steps to develop a PM&E system

STEP	STAGE	MABOMO			MUNGAZI		
		Activity Code	Participants	Date	Activity Code	Participants	Date
Planning the PM&E	Action plan recall	Focus group MA_F1 Interviews	Fiscals 11 CBO members	17.04.2011 18.05.2011 to 25.06.2011	Interviews	10 CBO members	21.05.2011 to 20.06.2011
	Review of reasons for evaluation	General Meeting MA_G1	General meeting	08.05.2011	Focus group MU_F1	Secretary, treasurer, fiscal chief, and two regular members	23.04.2011
	PM&E team conformation						
PM&E focus	Develop evaluation questions, goals and objectives						
PM&E system development	Identification of indicators and how to measure them	Workshop MA_W	PM&E team	09.05.2011	Workshop MU_W	Secretary, treasurer, fiscal chief, and a regular member	12.05.2011
	Development of the evaluation instrument (symbol based)						
	PM&E action plan						
PM&E information collection and analysis	Information collection	Focus group MA_F2	PM&E team and Directives	18.05.2011	Focus group MU_F2	Fiscals and directives	22.05.2011
	Information analysis	Focus group MA_F3	PM&E team and Directives	25.05.2011	Focus group SWOT	Secretary, fiscal chief, 3 regular members	02.07.2011
		SWOT MA_G2	General meeting	24.06.2011	MU_F3		
PM&E presentation	Summary of presentation meeting *	Focus group MA_M	General meeting	29.06.2011			

MA: Mabomo; MU: Mungazi; F: Focus group; M: group meeting; G: general meeting; W: workshop

* Only applicable in Mabomo

** Only applicable in Mungazi

Table 16: Guiding questions to develop a PM&E system

STEP	STAGE	GUIDING QUESTIONS
Planning the PM&E	Action plan recall	What are the activities that the association has implemented? Were there implemented as planned? Why? What are the plans for the future?
	Review of reasons for PM&E	What information we want to know from our activities? And, what we want to get out of the PM&E?*
	PM&E team conformation	Who wants to know what and why?*
		Modified from Burke 1998, Slocum 2003 Modified from Haggmann et al. 1999, Probst 2002
PM&E focus	Develop evaluation questions, goals and objectives	What are objectives of the activity?, and why is the activity important?*
		How do we measure "success" of the activity?*
		What information we want to know from our activities? And, what we want to get out of the PM&E?*
		Modified from Cramb & Purcell 2001:12, Gleifus 2008:185
PM&E system development	Indicators PM&E instrument PM&E action plan	How can we observe progress of the actions/ activity? Who should observe the different indicators? How often?
		Modified from FAO 2003, Gleifus 2008:185
PM&E information collection and analysis	PM&E information analysis	Have new questions arisen that required additional collection of information?*
		What kind of decisions are to be made based on this information? *
		Why is the information necessary? *
		Modified from Cramb & Purcell 2001:12, Slocum 2003
		What can we learn from the experience? **
		Modified from Slocum 2003
		SWOT
		Strengths: What are the advantages of the Association for the success of the activities?
		Weaknesses: What are the disadvantages of the Association for the success of the activities?
		Opportunities: What external elements (in the village, institutions, and natural environment) could positively affect the outcome of the activities?
		Threats: What external elements (in the village, institutions, and natural environment) could negatively affect the outcome of the activities?
		Modified from Gleifus 2008:161

* Only applicable in Mabomo
** Only applicable in Mungazi

3.3.1.1 STEP 1: Planning the PM&E

The planning of the evaluation was performed in three steps as follows:

STAGE 1: Review of the reason for PM&E:

CBO members in Mabomo in a general meeting (MA_G1), and in Mungazi in a focus group (MU_F1) discussed the reason for implementing a PM&E system. The concept of PM&E was further elaborated using a M&E drawing as visual aid (see Appendix 1: TOOLS).

In Mungazi, participants were asked to brainstorm (individually) on the expectations and fear about the activity and the performance of the CBO. Similar ideas were put together to prioritize the most relevant ones.

STAGE 2: PM&E team conformation:

Participants were asked to nominate a team of members who will assume the responsibility of PM&E information collection and reporting to the rest of the group regularly in general assembly.

3.3.1.2 STEP 2: PM&E focus

Using the guiding questions shown in Table 16, the group collectively identify the focus of the PM&E and the parameters that the PM&E system will evaluate.

3.3.1.3 STEP 3: PM&E system development

The process was different for both CBOs, nevertheless it followed a three-step procedure completed in a workshop (MA_W, MU_W), as follows:

STAGE 1: Identification of indicators and how to measure them:

Indicators were developed to help follow the process and success of the activity over time. The indicators were set to be concrete and observable.

STAGE 2: Development of the evaluation instrument:

It was emphasized that the instrument should be useful for the group, not for the supporting agency.

STAGE 3: PM&E action plan:

The PM&E team decided who is responsible for doing the measuring and the timeline. In addition, in Mabomo the instrument was review and adjusted.

3.3.1.4 STEP 4: PM&E information collection and analysis

The process consisted of a three steps used for the PM&E information collection and analysis in each CBO.

STAGE 1: PM&E information collection:

While in Mabomo during the workshop MA_W, information from past events was collected to field-test the instrument; in Mungazi the information was collected during a focus group MU_F2

STAGE 2: PM&E information analysis:

Even though this was an initial analysis, it was clear for the PM&E team that the PM&E analysis should be a repetitive process, as it entails repeating, at specific intervals, the stages of observation (monitoring of indicators), and reflection (analysis of results of the observation) and proposed adjustments and corrections (Cramb, R. and, Slocum 2003). For this reason, the analysis process was repeated two times in Mabomo (MA_F2 and MA_F3) and Mungazi (MU_F2 and MU_F3) following the guided questions display in Table 16.

STAGE 3: SWOT:

In a general meeting (MA_G2) in Mabomo and in a focus group (MU_F2) in Mungazi, a participatory SWOT analysis was performed, following the guided questions in Table 16.

3.3.1.5 STEP 5: PM&E presentation

During monthly general assembly in Mabomo, the PM&E team showed the instrument to the rest of the CBO members, asking for feedback and support. After which, in a meeting with key informants (MA_ M), a process was facilitated to receive feedback of what has happened during the general assembly and make some general reflections, using guiding questions (Table 16).

3.3.2 IS THE PM&E AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?

Three components that enhance sustainability of a PM&E system were assessed: (i) handling of the gathering and analysis of PM&E information by the team members; (ii) usefulness of the PM&E system; (iii) and appropriateness with regard to the different group activities (Figure 12).

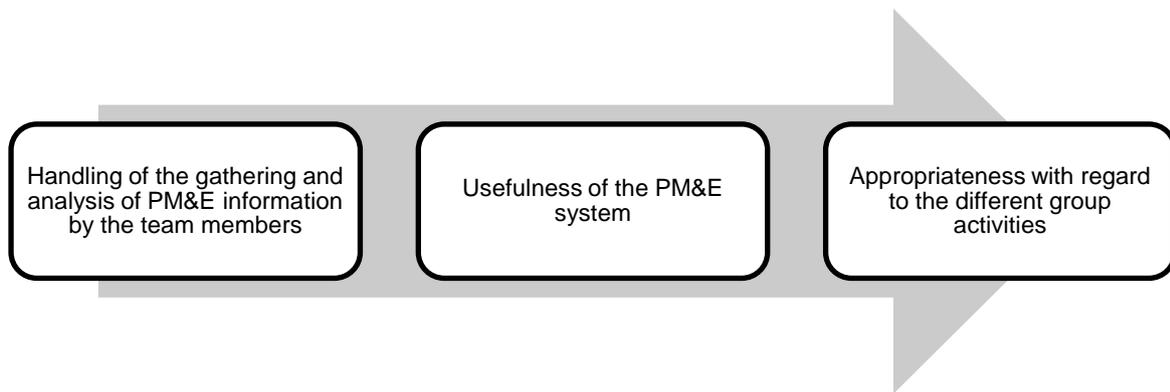


Figure 12: Steps used to assess the implementation, usefulness of the PM&E system
Mabomo and Mungazi

The approach to assess each component was based on the use of questions for which locally relevant criteria provided information (Table 17). The data collection method for this phase was based on the observations made to the focus groups and workshops done to develop and implement the PM&E system in both CBOs, as for a set of semi-structured interviews (see guided questions in Appendix 2: PM&E ASSESSMENT), in which the following topics were discussed:

1. Information flow regarding (i) the state of the activities implemented by the CBO, and (ii) PM&E system
2. Benefits from the PM&E system

3.3.3 WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?

Three components from the CBOs were used to assess its opportunities and barriers to enable community-based activities: (i) CBO structure; (ii) CBO performance; (iii) and lessons learnt by the CBO members (Figure 12).

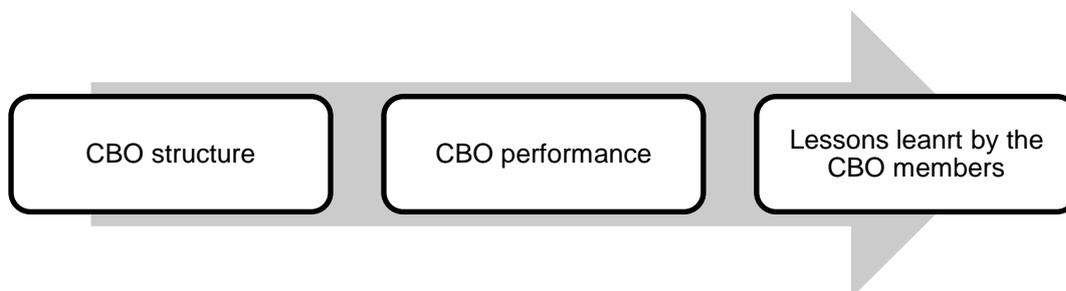


Figure 13: Steps used to assess the key opportunities and barrier from the CBOs to enable community-based activities

Table 17: Components, questions and criteria for the assessment of implementation, usefulness and appropriateness of a PM&E system

COMPONENT	QUESTION	CRITERIA	METHOD
Handling of information gathering and analysis	Is the data registration and analysis feasible for PM&E team members to carry out in the long-term?	Feasibility of information collection (Guijt 1998:46)	Observations from workshop and focus group with PM&E team members
	Is the PM&E fostering reflection?	Fostering reflection	
Usefulness of PM&E system	Is the information collected useful for those involved, and is helping them achieve their aims?	Information flow (Guijt 1999)	Focus group with PM&E team members
	To what extent did the CBOs institutionalized PM&E system?	Potential to extend the application (Guijt 1999)	Interview to CBO members
Appropriateness with regard to the different group activities	Is the information gathered filling information needs? producing new knowledge?	Knowledge generation	Observations
	Do CBO members perceive they are benefiting from the PM&E?	Motivation (Guijt 1999, McAllister 2001)	Interviews to CBO members

The data collection method for this stage was based on the application of semi-structured interviews based on the instrument developed by Levy (2011). The following topics were discussed with 11 interviewees in Mabomo (Table 12) and 10 in Mungazi (Table 13) (for guiding questions see Appendix 3: PERFORMANCE INQUIRY):

1. Perception of contribution from the CBO members;
2. Perception of benefits as regular and official CBO members;
3. Attainment of rules and non compliances;
4. Decision-making process;
5. Participation;
6. Lessons learnt

After the interviews were completed a feedback session with all the CBO members was done. These group discussions were also useful to confirm the knowledge acquired and to provide clarity on areas of uncertainty.

3.4 DATA ANALYSIS

The current case study seeks to provide qualitative empirical data to elucidate the key elements for the successful establishment of PM&E system; support or refute the hypothesis that a PM&E system is an effective approach in supporting community-based activities; and unfold key opportunities and barriers from the CBOs to enable community-based activities.

A content analysis was conducted with the information obtained from the interviews and the group discussion. The content analysis included coding the data with key words to identify similarities, consistencies, differences, and inconsistencies in respondent's answers, identifying patterns to explain the data. Tables and figures were then constructed based on this information.

Validity and reliability are important to determine the quality and accuracy of data collection techniques as well as quality of the data itself (Pretty 1995). The establishment of verification strategies such as triangulation and cross-checking of the information by combining tools and techniques which were self corrective, increases the validity and reliability (Estrella & Gaventa 1998, Woodhill & Robins 1998, Burke 1999, Anandajayasekeram et al. 2008).

4 RESULTS

4.1 DEVELOPMENT AND IMPLEMENTATION OF PM&E SYSTEM

A PM&E (participatory monitory and evaluation) system was developed and implemented with the members of two CBOs in the village of Mabomo and Mungazi. The following sections present the results for the five-step methodology (Figure 14), described in Section 3.3.1: DEVELOPMENT AND IMPLEMENTATION OF PM&E SYSTEM.

Each step is followed by a commentary that outlines the perception of the CBO members regarding the discussed topics .

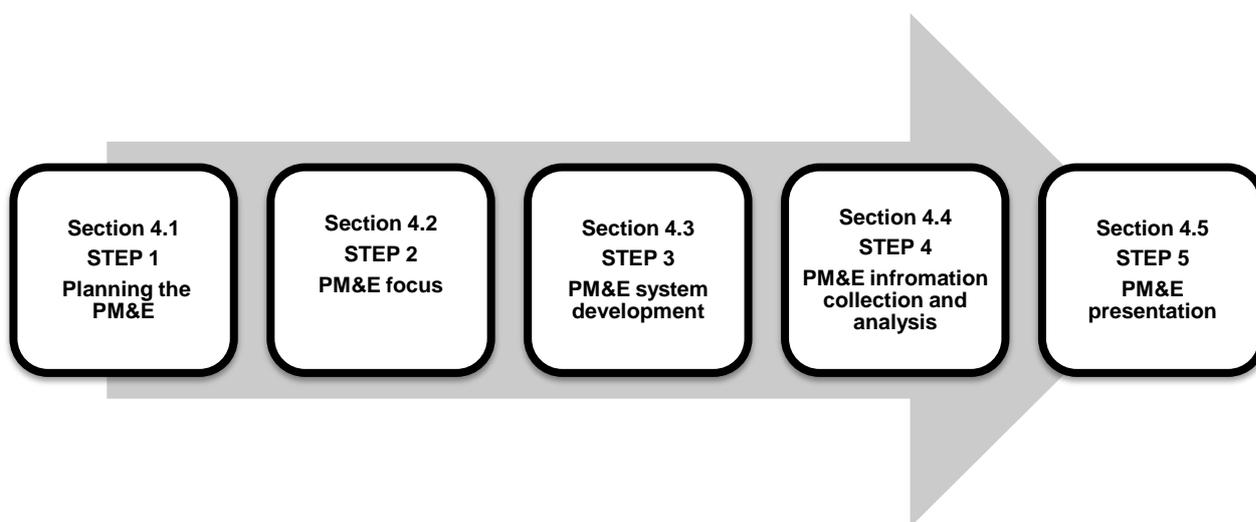


Figure 14: Steps used to develop and implement PM&E system in the CBOs in Mabomo and Mungazi

4.1.1 STEP 1: Planning the PM&E

The planning of the PM&E is divided in 2 stages: (i) Review of reasons for PM&E; and (ii) PM&E team conformation (see Table 15 and Table 16).

4.1.1.1 STAGE 1: Review of reasons for PM&E

In order to create a common understanding of what a PM&E system is and why it is useful, the M&E drawing (Figure 15) was used in both CBOs. After, achieving a common understanding the review of the reasons for PM&E was performed differently in each CBO. In Mabomo, the members have collectively acquired their first herd of 20 goats (Figure 16), and initiated a goat rearing activity. For this reason the centre of the discussion was on the goat keeping activity. In Mungazi, on the other hand, the discussion revolved around the expectations and fears from the CBO members. in the following, the main discussion points in each CBO are summarized.

Mabomo

CBO members in Mabomo (MA_G1, Table 15) discussed 'what information we want to know from our activities?' and, 'what we want to get out of the PM&E?'. They agreed that:

- PM&E system must be useful to identify if the activity works and how well it is working;
- It can help in the revision of actions, keeping track of where the activity is;
- It can be used to share the progress and results from the activities with all the members of the CBO.



Figure 15: M&E drawing used during the PM&E-planning meeting in Mabomo (MA_G1) and Mungazi (MU_F1). Modified form (Germann & Gohl 1996) Booklet 1 (see Appendix 1: TOOLS for text content in English)



Figure 16: Goats herd collectively purchased by the CBO in Mabomo (left), with the care of the herd assigned to a single CBO member, the herder (right)

Mungazi

CBO members in Mungazi (MU_F1, Table 15) discussed about their expectations and fears. In terms of *expectations or expected results*, the participants are concerned with the payment of the revolving loan scheme implemented with the fund provided by the project. They expect to be engaged in collective actions around an activity that follows the original plans of the CBO. The following are the prioritized statements: “*We hope/expect ...*”

- that all the debts are paid, and the money is used to buy animals and dig a well”;
- that we are able to work together towards predetermined objectives”;
- that we buy animals which can multiply, that we have medicaments to treat them”;
- that all the members of the CBO have access to benefits from being a member”

In terms of *fears or potential problems*, main concern of the participants is related with the non-repayment of the loans, followed by their perception that they have not implemented any activity (see 4.2.2.1). They are aware of the importance of having regular meetings where decisions are to be taken. The following are the prioritized statements: “*We fear/want to avoid...*”

- that we keep on waiting for the people with loans to pay”;
- that we are tired of planning and not acting”;
- that we are not doing meetings”;
- that we do not understand each other and we do not come to common decisions”;
- that the president and vice-president are absent for long periods”

4.1.1.2 STAGE 2: PM&E team conformation

From the discussion generated from the question ‘*who wants to know what and why?*’, members of both CBOs worked on the conformation of the PM&E team. Since the two CBOs had a group of fiscals selected by private voting during the CBO formation, they collectively decided to have the fiscals also as PM&E team. Nevertheless, as the PM&E process is strengthened with a greater participation, the PM&E team was opened to have other regular members integrating it.

In the CBO in Mabomo, the PM&E team was formed by the three fiscals (Maria Mpungo Ngulele, Cristina Rafael Machava, and Tiago Tielane Simango); the vice-president and veterinary promoter (Pedro Gawane Baloi); and the treasurer and collectively assigned herder of the CBO goats (Frazao Lainane Simago).

Two females, both illiterate, and a literate male, compose the group of fiscals. The male speaks Portuguese and owns a market place and a charcoal business. The veterinary promoter was trained by VET-AID in 2003 as a strategy to reduce morbidity and mortality of

animals caused by infectious and parasitic disease, and increase reproductive performance of livestock. He was also trained to monitor the veterinary promoter activity.

The herder was also responsible for selection and purchase of the goat herd of the CBO. He is literate, and a well engaged member of the village. He has a herd of goats of his own, and is respected for being a hard working person and having good production (both from the cropping fields and of livestock). As a herder, he is responsible for opening and closing the goats corral every day (so that the herd can graze and browse in communal areas around the village), cleaning the corral, and monitor the state of the goats. On a general meeting, CBO members in Mabomo agreed on the payment he is going receive for taking care of the CBO goats. The payment is going to be based on the results of the activity, if successful, one goat each semester.

PM&E team in Mungazi is composed of the three fiscals (Jossias Mungazi Chauque, Lucia Terani Chauque, Albertina Arone Chauque), the CBO treasurer (Piosse Samuel Chauque), the CBO secretary (Antonio M Chauque), and a regular member (Jotasse Matsumbane Chauque).

As in Mabomo, in Mungazi two females, both illiterate, and a literate and respected elder male, compose the group of fiscals. The treasurer is the youngest member of the CBO with 22 years. He is literate, speaks Portuguese, and is engaged in charcoal production. The secretary is also young, and literate. He is engage in woodcutting activity. The regular member is a wise and respected elder in the village.

The following functions for the PM&E team were established in both CBOs: develop the PM&E, collect and analyse information, and present it to the whole group for further analysis in plenary.

4.1.2 STEP 2: PM&E focus

As explained in Chapter 3.3.1.2, to attain the objective of a PM&E system one need to know what the objectives of the activity are and why is the activity important.

Based on the answers given by the CBO members in Mabomo (Table 18) and in Mungazi (Table 19), the focus of the PM&E system was established as:

Mabomo

“Allow the collection and processing of useful information by and for CBO members in order to keep track of how the goat keeping activity is and to apply corrective actions when needed” (MA_G1, Table 15).

Mungazi

“To provide a reflection space in order to allow CBO members to think on the importance of repaying the loans and use the money in accordance with the original objectives” (MU_F1, Table 15).

Table 18: Related to the PM&E focus activity in the CBO in Mabomo (MA_G1)

<i>What are objectives of the activity?</i>
- The reproduction of the goats
<i>Why is the activity important?</i>
- To provide one female goat to each active member of the CBO;
- To sell the male goats;
- To use the money for a revolving loan scheme
<i>How do we measure “success” of the goat activity?</i>
- Number of animals;
- Reproductive status;
- Health

Table 19: Related to the PM&E focus activity in the CBO in Mungazi (MU_F1)

<i>What information we want to know from our activity?</i>
- If by the work that the loan-holders are doing they are going to be able of paying;
- How much money is being repaid
<i>What we want to get out of the PM&E?</i>
- More members repaid their loans;
- The money from the repayment is used according to the CBO’s objectives

4.1.3 STEP 3: PM&E system development

The PM&E system development is divided in 3 stages: (i) Identification of indicators; (ii) Development of the PM&E instrument; (iii) PM&E action plan (see Table 26).

4.1.3.1 STAGE 1: Identification of indicators and how to measure them

PM&E team members of both CBOs developed a set of indicators (Table 20 and Table 21), based on the priorities set during the STEP 2: PM&E focus (section 4.1.2). For the collective development of indicators, critical reflection was induced with the question ‘*how can we observe progress of the activity?*’ (see guiding questions Table 16).

Indicators in Mabomo are based on the number of animals, their reproductive status, and health (MA_W, Table 15). On the other hand, indicators in Mungazi are based on the number of members benefited from the loan activity and the amount of money used and repaid (MU_W, Table 15).

Table 20: Issues, indicators and data collection methods of the PM&E system in Mabomo (MA_W, MA_F2)

ISSUE	INDICATOR	HOW TO MEASURE	HOW TO RECORD
Herd	<ul style="list-style-type: none"> - total number of goats - Number of deaths - Number of newborns 	Observation by herder	Monthly in the symbol-based instrument
Body condition	<ul style="list-style-type: none"> - Number of healthy animals - Number of unhealthy animals, symptoms: <ul style="list-style-type: none"> o not shiny fur o bloat belly o urine with blood o tick over presence o extremely thin 	Observation by herder	Monthly in the symbol-based instrument; Symptoms orally transmitted to the rest of CBO members during general meeting
Management	<ul style="list-style-type: none"> - Herder* - Type of corral - Number of animals de-wormed - Number of animals vaccinated - Number of animals with other treatments 	Observation by herder and veterinary promoter	Monthly in the symbol-based instrument; Register in book of veterinary promoter
Reproductive capacity*	<ul style="list-style-type: none"> - Number of females that have reproduced - Number of females that have not reproduced 	Observation by herder	Monthly in the symbol-based instrument
Outcome of goat keeping*	<ul style="list-style-type: none"> - Females given to active members - Number of males sold for loans - Money received from each male sold 	Observation by herder	Monthly in the symbol-based instrument; Register in secretary and treasurer book

**data added after the re-adjustment (MA_F2)*

Table 21: Issues, indicators and data collection methods of the PM&E system in Mungazi (MU_W)

ISSUE	INDICATOR	HOW TO MEASURE	HOW TO RECORD
Members benefited from the loan activity	<ul style="list-style-type: none"> - Number of members with loans - Position of the members benefited - Objective of the loans 	Informal interview to the loan holders by fiscals	Register in secretary book
Money use in the loan activity	<ul style="list-style-type: none"> - Amount of money given for loan - Amount of money repaid 	Informal interview to the loan holders and treasurer	Register in treasurer book

4.1.3.2 STAGE 2: Development of the PM&E instrument

After the indicators were selected and approved in Mabomo, the facilitators (translator and author) developed an outline of the instrument to be used in documenting the PM&E process (Figure 17). De-codification of the symbol-based instrument is given in Appendix 4: SYMBOL-BASED INSTRUMENTS.

In Mungazi the members were reticent of conducting the PM&E using an instrument, even when it was proposed to be symbol-based. For the revolving loan scheme the PM&E team preferred to strengthen the information channels they already had and transmit the information orally.



Figure 17: Development of PM&E instrument in Mabomo (MA_W1)

4.1.3.3 STAGE 3: PM&E action plan

During the general meeting (MA_G1, Table 15) the PM&E team of Mabomo selected the members responsible for documenting and reporting the information related with the indicators. The PM&E information shall be presented to all the members of the CBO once a month during the general meeting. The herder and one fiscal were selected for this task.

In Mungazi during a focus group (MU_F1, Table 15), the treasures and the fiscal chief, were selected to be responsible for collecting and transiting the information to the rest of the CBO members.

4.1.4 STEP 4: PM&E information collection and analysis

The planning of the PM&E is divided in 3 stages: (i) PM&E information collection; (ii) PM&E information analysis; (iii) SWOT.

4.1.4.1 STAGE 1: PM&E information collection

In the CBO in Mabomo, the indicators and instrument were field-tested using information from past events between October 2010 and April 2011 (Figure 17). The herder with the support of the PM&E team continued filling the instrument for the month of May and Jun 2011. The information collected for PM&E of the goat activity is shown in Table 22.

Table 22: PM&E information collected for goat keeping activity in the CBO in Mabomo (MA_W, subsequent)

DATE	Total	STOCK			DEATHS			BODY CONDITION		ACTIVITY
		R	♀ Nr	♂	Nb	♀	♂	Nb	H	
Oct-10	20		19	1					20	20 bought
Nov-10	20		19	1					20	construction corral
Dec-10	20	1	15	1	3	3	2	20		Herder: Frazao
Jan-11	20	1	15	1	3			20		
Feb-11	20	1	15	1	3			20		
Mar-11	20	1	15	1	3			20		
Apr-11	27	9	7	1	10			27		
May-11	27	12	3	1	11	4	2	27		
Jun-11	27	12	3	1	11			27		
TOTAL	27	12	3	1	11	4	0	4	27	0

♂: male; ♀: female; R: reproduced; Nr: not reproduced; Nb: new born, H: healthy; Uh: unhealthy

In the CBO in Mungazi the fiscals acquired the information regarding the revolving loan scheme (Table 23). 80.5% of the money from the CBO in Mungazi was used in the revolving loan scheme. 4 out of 7 members have started paying their debts, and one member has paid it completely. However, the repayment rate is still low. 17.7% of the money given on loan has returned to the CBO. As described by one of them (MU03-O), the established PM&E team actions were:

“What we are doing as Fiscals in order to have the money back, is that we divided the fiscals according to the number of persons with a loan, so that each fiscal is in charge or responsible for a determined number of people with debts. With this, we will verify if the undertaken activities will guarantee that the money is going to return. We try to mobilize those with debts so that they pay”.

Table 23: PM&E information collection for revolving loan scheme develop in the CBO in Mungazi (MU_F2)

CBO MEMBER	POSITION	OBJECTIVE of the loan	LOAN (Meticais)*	REPAID (Meticais)*
Rodrigues	President	Wood cutting, Pig raising, Grocery	8810 + 4000	
Lourenco	Vice-president	Wood cutting	6000	2000
Antonio	Secretary	Wood cutting	4000	1500
Lucia	Fiscal	Grocery	3000	1500
Bete	Fiscal	Grocery	3000	
Jonas	Fiscal	Wood cutting	4000	
Flora	Regular	Charcoal production	1000	1100
TOTAL			33810	6100

* 1 Euro = 42 Meticais (10.05.2011)

4.1.4.2 STAGE 2: PM&E information analysis

In the CBO in Mabomo, the PM&E information was analyzed in two focus groups (MA_F2 and MA_F3, Table 15) to guarantee the iterative structure of the process. In the CBO in Mungazi, the analysis of the information was only possible once (MU_F2, Table 15). The results of the focus group meetings are summarized below:

Mabomo

In the first focus group (MA_F2), the PM&E team invited the directives of the CBO to join the discussion. The PM&E team members explained the instrument to the directives. This was useful for re-adjusting the instrument. From the discussion arising from the question *'have new questions arisen that required additional collection of information?'*, two more issues with their respective indicators were included in the instrument, as shown in Table 20*:

- Reproductive capacity of the animals;
- Outcome of the goat keeping activity

In the second focus group (MA_F3) the PM&E team and directives discussed *'why is the information necessary?' and 'what kind of decisions are to be made based on this information?'* The following information came out from the discussion:

- Types of goats: They have two goat breeds; the common breed from the areas, and one male goat brought from Chicualacuala (district near the border with Zimbabwe). This is the only male without horns. This breed grows bigger, but doesn't reproduce as fast as the local goats, as stated by the CBO secretary. It is important here to state that the secretary is not an experienced goat keeper, and that particular goat from Chicualacuala

was his first acquisition (MA_F3, MA02-O).

- Deaths: The dead goats have been newborns (4 out of 11 newborns) and mothers giving birth (3 out of 20 females, all giving birth). According to the PM&E team members, the number is not high for the area, moreover having in mind that the females are giving birth for their first time (MA_F3, MA03-OT). The PM&E team members state that the mortality rate should decrease in the second and third birth of the mothers. If the mortality rate does not decrease, then the CBO will take actions (MA_F3, MA01-O). At the same time, they stated that for the area it is not a common practice to control the breeding of the goats (MA_F3, MA03-OT).
- Number of females not reproducing until now: it is important to wait to see if the females that have not given birth are going to do it or not. In the case that they are not fertile or not reproducing, then these goats are going to be sold at a price higher than that which they were bought (MA_F3, MA03-OT).
- Sex of the newborns: the females are going to be kept in order to have more potential mothers. The males are going to be sold (MA_F3, MA04-OT). The money obtained from the sale of the males is going to be used in the implementation of a revolving loan scheme (MA_F3, MA01-O). The scheme will start with small loans in order to ensure that the recipients can return the money. The selection of the people benefited with loan will be done during general meeting. Preference will be given to those with an economical need. The rest of the details related to the revolving loan scheme are to be discussed in a plenary meeting, that shall take place when they gather enough males (MA_F3, MA01-O).

Mungazi

In the CBO in Mungazi, after the question '*what can we learn from the experience?*', the participants in the focus group (MU_F2, Table 15) stated that they are aware that the use given to the money has not lead to a positive or beneficial situation. According to the members, they are looking forward to correct this situation. The subsequent comments regarding the loan experience represents the general perception from CBO members:

"I recognize that the money was used in an incorrect way, but we have realized it. I will like that the project doesn't stop here so that we have the opportunity to correct our actions and used the money in accordance to the objectives of the CBO" (MU_F2, MU04-OT)

"The thing is that the loans were given before we determined the rules for the revolving loan scheme. Before this, some members took money for loan, and no

rules were defined for this activity” (MU_F2, MU05-RT)

From the question ‘*what kind of decisions are to be made based on the experience?*’, the PM&E team stated that they need to:

- Work together;
- Use the money they currently have in buying animals;
- Not focus all their energy in the repayment of the loans;
- Have someone in charge when the president and vice-president are absent.

4.1.4.3 STAGE 3: SWOT Analysis

In a general meeting in Mabomo (MA_G2), and a focus group in Mungazi (MU_F3) a participatory SWOT analysis was performed (Figure 18).

Mabomo

The results of the analysis performed in the CBO in Mabomo are shown in Table 24. The SWOT analysis reveal that the CBO members are aware of their strength and opportunities. To a lesser extent they are aware of the challenges of the organization.

Mungazi

The results of the analysis performed in the CBO in Mungazi are shown in Table 25. The SWOT analysis was transformed into a positive way by drawing on the other side of the meta-card the solution for the problems they stated (Figure 18).

4.1.5 STEP 5: Presentation and action plan

During the monthly general assembly of July in Mabomo, the PM&E team showed the instrument to the rest of the CBO members asked them for feedback and support. The CBO members approved the instrument and concluded that the PM&E process should continue for the goat keeping activity, and should be implemented for the confined pig rearing in improved conditions and veterinary pharmacy.

In Mungazi the members did not have a general meeting, so to the date the field phase was finished, the presentation of the process was not possible.

Table 24: Result from the SWOT analysis performed in Mabomo (MA_G2)

STRENGTHS	WEAKNESS
<p><i>'What are the advantages of the CBO for the success of the activity?'</i></p> <ul style="list-style-type: none"> • Clear objectives, know where are they going; • Decision-making process and planning of activities during general meetings; • Success in the implementation of the first activity (goat keeping); • Positive discussion of how to benefit; • Members like to innovate, experiment and learn; • They want the CBO to be a symbol, to have implication in the Village; • Members like to work in cooperation; • PM&E system implemented for the goat keeping activity 	<p><i>'What are the disadvantages of the CBO for the success of the activity?'</i></p> <ul style="list-style-type: none"> • Slow implementation of activities
OPPORTUNITIES	THREADS
<p><i>'What external elements (in the village, institutions, and natural environment) could positively affect the outcome of the activities?'</i></p> <ul style="list-style-type: none"> • Transport possibilities (public transport to the District Headquarters twice a week); • Cell phone communication is not easy but is possible; • Having the villages veterinary promoter as a member of the CBO, what means experience and knowledge in the treatment of livestock and pharmacy accounting; • This year they have a good harvest, some products form them can be used to feed the pigs; • Norms and sanctions in the village are effectively enforced; • Practice with rotational schemes for village activities (for example the rotational scheme for the preparation of food for kids of the school by their mothers) 	<p><i>'What external elements (in the village, institutions, and natural environment) could negatively affect the outcome of the activities?'</i></p> <ul style="list-style-type: none"> • Climate variability can affect their production system (food for feeding the pigs), and the grasses near the village (food for the goats)

Table 25: Result from the SWOT analysis performed in Mungazi (MU_F3)

STRENGTHS	WEAKNESS*
<p><i>'What are the advantages of the CBO for the success of the activity?'</i></p> <ul style="list-style-type: none"> • Group has members of all the ages and both genders are represented; • The last decisions have been taken during general meeting; • Started the corrective actions by buying goats 	<p><i>'What are the disadvantages of the CBO for the success of the activity?'</i></p> <ul style="list-style-type: none"> • Slow implementation of activities / Use the money the CBO has to buy goats; • Loans given without rules and not re-paid so far / Accelerate loan repayment; • Important decision were taken only by some officials / All decision must be taken in general assembly, and implemented; • Officials are absent or too busy to lead the CBO / Officials should leave someone in charge; • Members need to work together
OPPORTUNITIES	THREADS
<p><i>'What external elements (in the village, institutions, and natural environment) could positively affect the outcome of the activities?'</i></p> <ul style="list-style-type: none"> • Experience and knowledge in livestock keeping; • Good availability of grasses in the area 	<p><i>'What external elements (in the village, institutions, and natural environment) could negatively affect the outcome of the activities?'</i></p> <ul style="list-style-type: none"> • Climate variability can affect their production system, and livelihood; • Water available in long distance from grasses; • No transport, neither means of communication

* Solution (on the back side of the cards) are shown after the “/”



Figure 18: SWOT analysis with the CBO members in Mabomo (left) (MA_G2) and Mungazi (right) (MU_F3)

Table 26: Comparison of the main issues in the development of the PM&E system in Mabomo and Mungazi

STEP	CBO in MABOMO	CBO in MUNGAZI
Planning the PM&E	<i>Reason for the PM&E:</i>	
	<ul style="list-style-type: none"> - Identify if the activity works and how it is working; - Revision of actions, to keep track of where the activity is; - Share the progress and results from the activities 	<ul style="list-style-type: none"> - Accelerate the re-payment of the loans; - Use the money in accordance with the original objectives
	<i>PM&E Team composition:</i>	
Mabomo (MA_G1) and Mungazi (MU_F1)	<ul style="list-style-type: none"> - Fiscals, herder and livestock health promoter 	<ul style="list-style-type: none"> - Fiscals, treasurer, secretary, one regular members
<i>PM&E Team functions:</i>		
PM&E development, PM&E information gathering and analyzing, presenting in plenary to the CBO members		
PM&E focus	<ul style="list-style-type: none"> - “Allow the collection and processing of useful information by and for CBO members in order to keep track of where the goat keeping activity is and to apply corrective actions when needed” 	<ul style="list-style-type: none"> - “To provide a reflection space in order to allow CBO members to think on the importance of repaying the loans and use the money in accordance with the original objectives”
PM&E system development	<i>Identification of indicator:</i>	
	<ul style="list-style-type: none"> - Herd dynamics; - Body condition; - Management aspects; - Reproductive capacity; - Outcome of goat keeping activity 	<ul style="list-style-type: none"> - # of members benefited from the revolving loan scheme; - Amount money used in the revolving loan scheme; - Amount money repaid; - Investment in animals
	<i>Development of the PM&E instrument:</i>	
Mabomo (MA_W) and Mungazi (MU_W)	<ul style="list-style-type: none"> - Symbol-based 	<ul style="list-style-type: none"> - Oral transmission of the information
<i>Information gathering:</i>		
	<ul style="list-style-type: none"> - Herder and one fiscal 	<ul style="list-style-type: none"> - Treasurer and fiscal chief
<i>Information analysis:</i>		
	<ul style="list-style-type: none"> - PM&E team 	<ul style="list-style-type: none"> - PM&E team
<i>Timeline:</i>		
	<ul style="list-style-type: none"> - Once a month before the general meeting 	<ul style="list-style-type: none"> - Once a month before the general meeting
Presentation and action plan	<ul style="list-style-type: none"> - PM&E team presented to the rest of the members during general meeting 	<ul style="list-style-type: none"> - No general meeting was done

4.2 IS THE PM&E SYSTEM AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?

The following section presents a comparative assessment of the handling of the gathering and analysis of the PM&E information for each CBO (section 4.2.1). The usefulness of the PM&E system is appraised in section 4.2.2. Finally, in section 4.2.3 the appropriateness of the PM&E system concerning the different group activities is evaluated.

4.2.1 Handling of the gathering and analysis of PM&E information by the team members

The criteria selected to assess the handling of PM&E information gathering and analysis by the team members are divided in those that demonstrate: (i) The feasibility for the participants to carry out the PM&E in the long term; (ii) The reflection from the information collected.

In the CBO in Mabomo, the collected PM&E information focused on the local management variables of the goat keeping activity. It covers aspects such as: herd dynamics, body condition, management aspects, reproductive capacity and outcomes of the activity (see Table 26).

The PM&E information produced until July in the CBO in Mabomo (Table 22) is valuable as seen from the analysis and recommendations given by the PM&E team (Table 27). Two good indicators of the feasibility to carry out the PM&E in the long-term are:

- (i) the ability of the participants to fill the instrument by themselves; and
- (ii) the ability of the participants to explain the instrument to other members.

In the CBO in Mungazi, the PM&E focus was first intended to be on the revolving loan scheme. Nevertheless, a change of focus happened during the course of the process (Chapter 4.1.2). Indeed, the reflection exposed aspects relative to group performance (benefit distribution) and structure (meetings, decision-making, and compliance of rules).

The gathering and analysis of the PM&E information in the CBO in Mungazi became more informal than formal. The PM&E team members realized the low feasibility to carry out the PM&E using the symbol-based instrument for the revolving loan scheme. As shown in Table 27, they did not fill the instrument in an instance different than the workshops with the facilitator. They rely on verbal communication of the information, based on memory. At the same time, the CBO has failed in meeting regularly, so the information flow regarding the

state of the revolving loan scheme and the work of the PM&E team was restricted to discussions during casual meetings.

Even though the feasibility for the participants to continue with the PM&E instrument for the revolving loan scheme is low, the process of implementation of the system did foster important reflections among the group members (see evidence in Table 27).

Table 27: Comparison of handling of information gathering and analysis during the PM&E implementation process for the CBOs in Mabomo and Mungazi

Criteria	CBO in MABOMO	CBO in MUNGAZI
Feasibility	<p>The PM&E team show understanding of the instrument and its parts because:</p> <ul style="list-style-type: none"> - The ability of filling the instrument by themselves (MA_W, observation herder); - The ability to explain the instrument to other members (MA_F2, MA_M) 	<p>For PM&E the revolving loan scheme activity a written instrument is not feasible because:</p> <ul style="list-style-type: none"> - The PM&E team did not filled the instrument in a different instance that in the workshops with the facilitator; - Rely more in verbal communication of the information based on memory
Fostering reflection	<p>Reflection on the information collected can be seen by the following recommendations from monitoring events:</p> <ul style="list-style-type: none"> - Adjustment of the instrument (MA_F2); - Clarification of objectives of the activity and how will benefit the members (MA_F3) 	<p>Reflection on the collected information can be seen by the following corrective actions:</p> <ul style="list-style-type: none"> - Improve information flow (MU_F2) (see below); - Use the money from the repayment to buy goats; - Repayment of loans (1 member completely and 3 partly)

4.2.2 Usefulness of PM&E system

The usefulness of PM&E system can be measured by: (i) The extent of information flow; and (ii) The potential to continue with the PM&E system and/or extend its application to other activities.

4.2.2.1 Information flow within the CBO

The PM&E shall strengthen or/ and enhance the information flow with regard to (i) The state of the activities undertaken by the CBO; and (ii) The state of the PM&E system.

1. State of the activity

Information flow both in Mabomo and Mungazi is characterized by the general awareness of the CBO members of the state of the activity (Table 28 and Table 29). In Mabomo, all the CBO members are aware of the activities implemented and the short-term plans, however when asked, only 18% of the members recalled the long-term plans (Table 28).

Most of the CBO members in Mungazi (90%) are aware of the short-terms plans, while less than the 30% of the interviewed members recall the long-term plans when asked. In this

case, the perspective is not as clear as in Mabomo. Only one half of the interviewed members perceived that they have not done any activity. Interesting to point out is the fact that only 1 of the interviewed members (MU04-OT) perceived the revolving loan scheme as an activity done by the group (Table 29).

Table 28: Perception of the CBO members in Mabomo regarding the state of the activities planned and implemented

ACTIVITY	Number of MEMBERS	
	Sum	(%)*
<i>What are the activities that the CBO has implemented?</i>		
- Purchase of goats and construction of their corral (Figure 16);	11	100
- Cutting of poles for a traditional pig corral;	11	100
- Construction of an improved corral for pigs according to the new plans (currently under development)	11	100
<i>Were the activities implemented as planned, why not?</i>		
- Change of decision regarding the construction of the traditional pig corral, with new plans aiming for the construction of an improved corral;	9	82
- The delay in the construction of the improved corral was because of difficulties in withdrawing the money from the bank. Nevertheless now the CBO has overcome the difficulties	4	36
<i>What are the plans for the future?</i>		
- Buy pigs;**	11	100
- Construct an improve corral for goats;**	11	100
- Buy medicaments for the livestock pharmacy;***	2	18
- Open a well for the animals to drink water;***	2	18
- Common market***	2	18

* % of respondents, n=11; **short-term plans; *** long-term plans

2. State of the PM&E system:

After the general meeting in which the PM&E team from Mabomo presented the system to the rest of the CBO, all the interviewed regular members replied that they were informed of the ongoing process lead by the PM&E team. The following commentary from a regular CBO member exemplifies the general perception regarding their knowledge of the state of the activity:

“I received information about the PM&E instrument developed by the fiscals to monitor and evaluate the goat keeping activity” (MA10-R)

In Mungazi was not possible to organize a general meeting to socialize the process with the rest of the CBO members. They give as reason the off-farm activities in which they are engaged, which are crucial to obtain their livelihood. Nevertheless, the PM&E team

recognized that they have failed in sharing the collected PM&E information with the rest of the group members. As stated by the fiscal chief, (MU_F2, MU04-OT), they thought this was a duty of the president or vice-president of the CBO. To correct the information flow regarding the PM&E system the responsibilities of the PM&E team established at the beginning of the process were recalled: develop the PM&E, collect and analyse information, and present it to all CBO members for further analysis in plenary. The PM&E team committed to inform the rest of the CBO members of the state of the revolving loan scheme during the general meetings, as well as the information collected as part of the PM&E process.

Table 29: Perception of the CBO members in Mungazi regarding the state of the activities planned and implemented

ACTIVITY	# MEMBERS	
	Sum	(%)*
<i>What are the activities that the CBO has implemented?</i>		
- Nothing;	5	50
- Construction of a pig and goat corral (Figure 19);	4	40
- Establishment of a revolving loan scheme	1	10
<i>Were the activities implemented as planned, why?</i>		
- Originally we had other plans	10	100
<i>What are the plans for the future?</i>		
- Buy goats;**	9	90
- Train a member of the CBO as veterinary promoter,**	3	30
- Constructing a house for the CBO;***	2	20
- Buy medicaments for the livestock pharmacy;**	1	10
- Open a well for water***	1	10

* % of respondents, n=10; **short-term plans; *** long-term plans

4.2.2.2 Potential to continue with the PM&E system and/or extend its application to other activities

There is potential in both CBOs to continue with the PM&E system, and even extend its application to other activities. In both CBOs, members of the PM&E team as well as regular members are aware the importance of having a PM&E system for the animal keeping activity and the livestock pharmacy.

In Mabomo, the PM&E team started to work on the instrument to monitor and evaluate the pig rearing activity in improved confined conditions (Figure 20), which was about to be implemented. The PM&E team recognized and stated that the instrument should have the same information as the PM&E goat instrument (MA_ M). For the veterinary pharmacy the CBO members concluded that the person in charge of this activity should be different than the village veterinary promoter, in order to prevent future misunderstandings. The CBO members also concluded that the village veterinary promoter, who is the vice-president of

the CBO, should train another CBO member to perform this activity and its corresponding M&E (MA_ M).



Figure 19: Pig (right) and goat (left) corrals in Mungazi

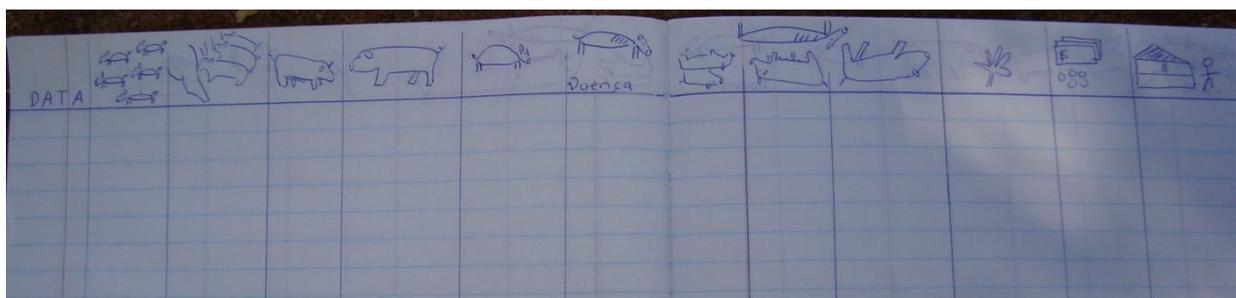


Figure 20: Instrument for the PM&E of the pig keeping activity in Mabomo (see de-codification of the symbols in Appendix 4: SYMBOL-BASED INSTRUMENTS)

The following commentaries from CBO members outline the general perception regarding the need of a PM&E system for the livestock pharmacy in the CBO in Mabomo:

“I think that we must have a register of the livestock pharmacy, when the medicaments are bought and used” (MA06-R)

The following commentaries from CBO members outline the general perception regarding the need of a PM&E system for the livestock pharmacy and pig rearing activity in the CBOs in Mungazi:

“The same if we buy animals, it is important to register how much they cost and if they have reproduced and in which health state they are” (MU07-R)

“When we have the livestock pharmacy, it is very important to register how the medicaments are used” (MU06-R)

4.2.3 Appropriateness with regard to the different group activities

To assess the appropriateness of a PM&E system one must evaluate the information generated by it.

4.2.3.1 Knowledge generation

In both CBOs, the PM&E system is helping in the generation of knowledge and skill regarding administrative process, such as improving decision-making process, increase transparency and accountability. Specific knowledge generated in each CBO is described as follows.

Mabomo

Previously, information about goat keeping activity had never been documented in the village of Mabomo. Therefore, the PM&E system does provide information that can be valuable for the CBO members, and the village in general.

CBO members want to innovate in livestock keeping practices by raising goats using improved corrals as well as pigs under improved confined conditions. Since these types of conditions are new to the area, new valuable knowledge is going to be generated. PM&E is an important tool for the systematization of these innovative practices, and the subsequent analysis and reflection of the information generated. It may assist the CBO members to find which management strategies worked, and which ones did not worked. This information is to be used to correct errors from routines, and improve the effectiveness and efficiency of the activities (single-loop learning). CBO members can go further and critically reflect using 'why' questions. By incorporating the feedback produced from the critical reflection into planning, CBO members will be able of reframing the management strategies (double-loop learning) or even transforming the activities (triple-loop learning). In this way, the CBO can be used as a platform to share experiences and learn (see Table 41, section 5.1.2).

The participatory identification of indicators in the CBO in Mabomo legitimized the PM&E process (Chapter 4.1.3.1). These indicators represented the expectations of all the members of the CBO concerning the PM&E processes and the activity. During the process, it was clear for the PM&E team what they wanted to achieve.

Mungazi

In Mungazi as the PM&E system came out is not contributing to generate new knowledge from the revolving loan scheme activities. However, it has been positive in generating self-reflection among the CBO members. Even when the PM&E system served as an instrument

for learning and development of the CBO, its focus should be changed as the CBO grows, gains experience, and implements more activities.

4.2.3.2 Motivation

The motivation can influence the CBO members' willingness to commit with the use of a PM&E system. This motivation to use the PM&E system comes from the participants' perception of benefits from its use. Moreover, CBO members of both CBOs are aware of the importance of having a PM&E system, as exposed in Table 30.

In Mabomo, there is a general perception of the CBO members that the PM&E system is the correct approach and will work (Table 30). The following commentaries from regular CBO members represent the general perception regarding the relevance of the PM&E system:

“I think the instrument is important and the information it is giving is the needed, and is going to permit us control the goat keeping activity” (MA06-R)

“I thought it was very important the process of monitoring and evaluation, with the instrument we can know how many goats we have, and we can project to know more or less how many we will have in the future, and in this way control the activity” (MA10-R)

“... the instrument has good information, because from it I can make a control of the activity, looking the newborns, deaths, and health of the animals. So in general it is going to permit us have a better control of the activity and be aware if something is not working right to improve it” (MA08-R)

In Mungazi the CBO members have feelings of helplessness and powerlessness. They feel that they have not succeeded in implementing a collective activity (Table 29), and the distribution of benefits was not equitable (Table 35). Moreover, they feel frustrated because those members with loans have not payed back, even though one member has paid completely the debt, and three members have repaid part of their loans (Chapter 4.1.4.1).

4.3 WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?

The following section presents a comparative assessment of the structure (section 4.3.1) and performance (section 4.3.2) of the CBOs in Mabomo and Mungazi, as well as the lessons learnt from the CBO members (section 4.3.3).

The assessment is based on the result from the application of a “Performance Inquire Instrument” based on Levy (2011) (see Appendix 3: PERFORMANCE INQUIRY for guiding

question) to 11 CBO members in Mabomo (Table 12), and 10 CBO member in Mungazi CBO (Table 13).

Table 30: Comparison of the man motivational aspects for the CBOs in Mabomo and in Mungazi

CBO in MABOMO	CBO in MUNGAZI
<i>Members of the CBO perceived the PM&E system to be beneficial because it gives:</i>	
<ul style="list-style-type: none"> - The information needed to keep track of how the goat keeping activity is; - The possibility to apply corrective actions if needed 	<ul style="list-style-type: none"> - Awareness of problems and desire to address them (see section 4.3.3, p. 74);
<i>Following events regarding the PM&E:</i>	
<ul style="list-style-type: none"> - Willingness to implement the PM&E system for other activities (see section 4.2.2.2, p. 63) 	<ul style="list-style-type: none"> - Money from the revolving loan scheme is returning to the CBO (see section 4.2.1, p. 60); - CBO started buying animals to implement a second activity (see section 4.2.1, p. 60); - Willingness to implement the PM&E system for other activities (see section 4.2.2.2, p. 63)

4.3.1 CBO structure

The structure of the CBO was assessed using proxy indicators such as (i) Compliance and sanctions, (ii) Decision-making process, (iii) Meetings, and (iv) Leaders. A comparative summary of how CBO members perceive the structure of the CBO in Mabomo and Mungazi is shown in Table 33.

4.3.1.1 Compliance and sanctions

In both CBOs, more than 80% of the interviewed members perceived that the rule least complied is participation in both activities and meetings (Table 31). What make the difference in both CBOs is the treatment of members not complying and enforcement of sanctions (Table 33).

Table 31: CBO members' perception of the rules less complied

Rules least complied	CBO in Mabomo				CBO in Mungazi			
	Number of members				Number of members			
	O n=5	%*	R n=6	%*	O n=5	%*	R n=5	%*
Participation	4	80	5	100	5	100	4	80
Payment of fees	1	20	0	0	1	20	0	0
Non	1	20	1	20	0	0	2	40

* % of respondents; R: regular, O: official

To have an absence in the CBO in Mabomo, the failure to participate must not be justified. If there is a justification, like if the person is not in the village, then it is not counted as

absence. The following commentary from a regular CBO member outlines the general perception regarding rule attainment:

“Almost all the member followed all the rules” (MA08-R)

Those not complying are first called to explain the reasons of their absence. Then, after five no justified absences the member is expelled from the CBO. One member of the CBO in Mabomo was already expelled because of his constant absence to meetings.

On the other hand, in the CBO in Mungazi 20% of the interviewed members, all regular, state that they have not had the opportunity to see which rules are followed and which are not because they have not done anything together as a CBO. The following commentary from a regular CBO member represent the general perception regarding rules less complied:

“For the rules, I can't say, because we have not done anything, so how can I know which rules are not complying” (MU09-R)

The non-participation in activities and meetings is justified by absence or lack of time (working on their cropping fields or in charcoal production). Further, regular members complain that some of the members that are not complying are the officials.

4.3.1.2 Decision-making

To take decision in the CBO in Mabomo, the officials first have a debate, and then they take the issues to present them to all members of the CBO in a general meeting, where decisions are taken (Table 33). The secretary registers the decisions in the book. Both officials and regular member perceived that decisions in the CBO are taken collectively during plenary meetings (Table 32) and that all contributions are analyzed.

In the CBO in Mungazi, 80% of the officials expressed that the decision-making process is done collectively (Table 32). Nevertheless, 60% of the regular members stated that only the officials have taken important decisions like the adjudication of loans (Table 32). Furthermore, members complain that even though the group takes collective decisions, these are never implemented. The following commentary outlines the perception of regular members of the CBO in Mungazi regarding the decision-making process:

“The decisions are taken collectively in meetings, but not all, some decisions are taken just by the officials. For example the decision from the loan was taken by the officials alone, but the decision to buy animals was taken collectively” (MU10-R)

Table 32: Decision-making process in the CBO in Mabomo and Mungazi

Decision-making process	CBO in Mabomo				CBO in Mungazi			
	Number of members				Number of members			
	O n=5	%*	R n=6	%*	O n=5	%*	R n=5	%*
Collective	5	100	6	100	4	80	2	40
By Officials					1	20	3	60

* % of respondents; R: regular, O: official

4.3.1.3 Participation in group activities and meetings

In both CBOs the members came to the decision of having monthly meetings in a general assembly. The officials meet before the general assembly to plan it. In Mabomo, CBO members are meeting at least once a month, but when planning a new activity (construction of the improved corral, for instance) they meet more often (Table 33).

In Mungazi, meetings are not done as it was originally planned. CBO member give as reasons that either officials are not calling, or most of the members are too busy in their everyday activities to attend (Table 33).

The following commentaries outline the perception of the members of both CBOs regarding participation in meetings in Mabomo:

“All the members of the CBO participate in the activities. Even those sick send a member of the family to participate for them” (MA01-O)

The following commentaries outline the perception of the members of both CBOs regarding participation in meetings in Mungazi:

“Some of the members didn’t participate during the meeting in January, February, and March, because they were working the whole day in their cropping field, and when they arrived home they needed to cook and do other household activities. So they didn’t participate, or they were late. Now, the work in the cropping field is over, but there are still many people working on charcoal” (MU02-OT)

4.3.1.4 Leaders

In both cases, the village leaders are also official in the CBO. The president of the CBO in Mabomo is also the village leader, while the vice-president of the CBO in Mungazi is the community leader of three villages. In both cases, the elevation of the leaders came after their participation in the CBO.

In the CBO in Mabomo the leaders are committed and motivated, and the regular members have no complains about them. On the other hand, in the CBO in Mungazi, the regular

members are constantly complaining about the leaders, specially the president and vice-president, but they are afraid of changing them.

The following commentary with regards the leaders represents the perception of the CBO members in Mungazi:

“What makes conflict in the CBO is the lack of coordination with the president and vice-president, because they are absent for long periods, and then when they return, they do not agree on the decision that were taken by the rest of the members”(MU01-OT)

“There is a need in advising the officials of the proper way of leading the CBO” (MU05-RT)

Table 33: Comparative summary the structure of the CBOs in Mabomo and Mungazi

Component	CBO IN MABOMO	CBO IN MUNGAZI
Compliance and sanctions	<i>Rules less complied:</i>	
	- Participation in the group activities	- Participation in the group activities
	<i>Treatment:</i>	
	- Explain reasons to the rest of the CBO members; - After 5 non justified absence expelled from CBO	- Explain reasons to the rest of the CBO members
	<i>Actual situation:</i>	
	- One member expelled	- No sanctions imposed
Decision-making	<i>The decision-making process is done:</i>	
	- Officials first debate; - Issues are taken to general meeting where decision are taken; - Secretary registers the decision in the book	- Officials first debate; - Issues are taken to general meeting where decision are taken Nevertheless: - Officials alone have taken important decisions - Most of the decision taken collectively have not been implemented
	<i>Meetings are planned to be done:</i>	
	- General assembly once a month	- General assembly once a month
	<i>Meeting are actually performed:</i>	
Meetings	- Once a month or more often depending on what the CBO needs to plan	- Very rarely because: - Officials are absent and not calling for meeting; - Members are busy in other activities to ensure their own livelihood
Leaders	- President of the CBO is also the leader of the village; - Regular members have no complains	- Vice-president of the CBO is also the leader of the village; - Regular members complain about the president and vice-president, but do not replace them

4.3.2 CBO performance

The performance of the CBO was assessed using as proxy indicators (i) the perceived benefit from the CBOs members, (ii) their contributions, and (iii) their perception of a good working CBO. A comparative summary is provided in Table 38.

4.3.2.1 Benefits and contribution

Benefit is a very important discussion issue in the CBO in Mabomo, as expressed by several official members (MA01-O, MA03-OT, MA04-OT). Now after almost one year and half of work, they are discussing how to benefit, and how to ensure that all the members benefit from the CBO. Table 34 summaries the perceived benefits for official and regular members in Mabomo. For the officials is also evident the need to have both long-term and short-term benefits, so that the motivation to work continues.

The following commentary from a CBO member represents the general perception regarding short-term and long-term benefits:

“There are some that want to have short term benefits, but when they don’t have it, then the motivation decreases and they are not so happy of being a member of the CBO” (MA03-OT)

As for the contribution, 64% of the members perceived they are committed with their participation and payment of fees and 45.5% with ideas for improvement as seen in Table 34.

Table 34: Perception of benefits and contribution of CBO members in Mabomo

Type of benefit	Number of members			Type of contribution	Number of members		
	O n=5	R n=6	%*		O n=5	R n=6	%**
<i>Actual benefit:</i>				Participation;	3	4	64
Information share and learning;	2	1	27	Fees;	2	5	64
No benefit.	0	3	27	Ideas for improvement;	2	3	45
<i>Planned benefit:</i>				Good example;	1	2	27
From the goat activity;	4	2	55	Rule compliance;	1	1	18
Loan;	4	0	36	Don't know	0	1	9
Market;	2	0	18				
Proud;	1	1	18				
CBO vet pharmacy	0	1	9				

* % of respondents, n=11; 21 answers; R: regular, O: official

** % of respondents, n=10; 25 answers; R: regular, O: official

In Mungazi, as seen in Table 35, regular members perceive they have not had any benefit while the only ones who had benefited with loans are the official members. Even though there are no official plans for all the members of the CBO to benefit, 50% of the members agree they would like to do it from a possible implementation of goat keeping activity.

Now the CBO officials (different from president and vice-president) are aware of the importance of having plans so that all members can benefit from the CBO. The following commentaries from CBO members represent the general perception regarding importance of having plans so that all members can benefit:

“There are no plans so that all members of the CBO can benefit. It is important to make these plans in accordance of the objectives of the CBO” (MU01-OT)

“all the members of the CBO should have access to benefits” (MU04-OT)

60% of the CBO members in Mungazi perceived their main contribution is by giving ideas to improve, mostly related with the payment of loans, as seen in Table 35.

In both CBOs, contributions are monitored by taking records of participation in the secretary book and the payment of fees in the treasurer book.

Table 35: Perception of benefits and contribution of the CBO members in Mungazi

Type of benefit	Number of members			Type of contribution	Number of members		
	O n=5	R n=5	%*		O n=5	R n=5	%**
<i>Actual benefit:</i>				Ideas for improvement;	3	3	60
No benefit;	3	5	80	Rule compliance;	1	2	30
Loans.	2	0	20	Good example	1	0	10
<i>Planed benefit:</i>							
From the goat activity;	1	4	50				
CBO vet pharmacy;	1	1	20				
Loan;	2	0	20				
No plans	2	0	20				

* % of respondents, n=10; 22 answers; R: regular, O: official

** % of respondents, n=10; 10 answers; R: regular, O: official

4.3.2.2 Perception of a good working CBO

In both CBOs, members perceive that the proper functioning of the CBO is related with the success of the undertaken activities: the goats reproduce and the money from the revolving loan scheme is repaid. Table 36 and Table 37 show the perception of the CBO members in Mabomo and Mungazi with regards to the functioning of the CBO. In the CBO in Mabomo, the capacity of the members to work together, or conduct collective actions, is also perceived by regular members as a condition for the CBO to work properly.

Table 36: Perception of a good working CBO in Mabomo

<i>The good performance of the CBO depends on:</i>	Number of members		
	O n=5	R n=6	%*
The success of the activities;	4	4	73
Their capacity to work together;	1	4	45
Being a good example	2	1	27
Doing new things like the improve corrals for both pigs and goats;	1	0	9
The perceived benefits to the members	1	0	9

* % of respondents, n=11; 18 answers; R: regular, O: official

The following commentaries from official and regular members outline the general perception regarding group functioning in Mabomo:

“The CBO is doing good, is in a good path. This could be seen by the reproduction of the goats” (MA03-OT)

The following commentaries from official and regular members outline the general perception regarding group functioning in Mungazi:

“I think that the group will have a good performance when all the debts are paid, and the money is used to buy animals and dig a well” (MU03-O)

“For me the group will be having a good development when we are working together towards the predetermined objectives. When we acquire the animals, and they reproduce” (MU01-OT)

Table 37: Perception of a good working CBO in Mungazi

<i>The good performance of the CBO depends on:</i>	Number of members		
	O n=5	R n=5	%*
The use of the money in “accordance with the objectives”, that is buying animals for the CBO;	4	4	80
The payment of the loans;	3	0	30
The ability of working together to have both a collective and individual benefit;	0	2	20
The need of changing the officials, nevertheless they are afraid of doing it	1	1	20

* % of respondents, n=10; 15 answers; R: regular, O: official

Table 38: Comparative summary of the perceived performance of the CBOs in Mabomo and Mungazi CBO

Component	CBO in MABOMO	CBO in MUNGAZI
Perceived benefit	<i>CBO members perceive they benefit:</i>	
	<ul style="list-style-type: none"> - From the goat activity; - Learning and sharing information 	<ul style="list-style-type: none"> - Regular members haven't until now; - Officials with loans
	<i>Officials are:</i>	
	<ul style="list-style-type: none"> - Planning how all CBO members can benefit; - Awareness of the importance of having long-term and short-term benefits 	<ul style="list-style-type: none"> (different from president and vice-president) - Aware of the importance of having plans so that all CBO members can benefit
Contribution	<i>CBO members contribute to the CBO functioning by:</i>	
	<ul style="list-style-type: none"> - Paying the fees*; - Participating in the group's activities; - Following the rules; - Giving advice and good example 	<ul style="list-style-type: none"> - Giving advice to those whom benefited to give back the money; - Participating during the meetings and activities; - Paying the fees**; - Trying to pay the loans
	<i>In the CBO the contribution of the members is monitored by:</i>	
	<ul style="list-style-type: none"> - Registering participation in the secretary book; - Registering payment of fees in the treasurer book 	<ul style="list-style-type: none"> - Registering participation in the secretary book; - Registering payment of fees in the treasurer book
Group functioning	<i>The CBO members perceived the functioning of the CBO depends on:</i>	
	<ul style="list-style-type: none"> - The success of the activities; - The perceived benefits the members; - Their capacity to work together; - Doing new things like the improve corrals for both pigs and goats; - Being a good example 	<ul style="list-style-type: none"> - The payment of the loans; - The use of the money in "accordance with the objectives"; - Buying animals for the CBO; - The ability of working together - Changing the officials

* 16 out of 18 members have paid their annual fees

** 13 out of 20 members have paid their annual fees

4.3.3 Lessons learnt by the CBO members

The members of both CBOs perceived they have learned several lessons during the course of the Organization. The lessons learnt in both CBOs are different, as the processes have been different.

In the CBO in Mabomo regular members perceived they have learnt about the importance of collective action and learning, while officials claimed that they have improved their skills in the management of the group and its activities (Table 39).

The following commentaries from CBO members in Mabomo represent the general perception regarding the importance of acting together, and their improved skills in planning and acting:

“I have learnt that together we can make great things that can't be done by one person individually. For example, because we are associated we were able to have money for the CBO, but alone, we will not have been able to have the money” (MA03-OT)

“Together we can go far, individually is not so easy. For example if we continue working together, in the year 2013 we will have enough animals to help in reducing poverty among the CBO members” (MA2-O)

“We learnt to do thing in practice and in thinking. We have been planning and doing and that's the most important thing I have learnt” (MA04-OT)

In the CBO in Mungazi, official and regular members learnt similar lessons (Table 40). The most common reply (80%) refers to the importance of investing the money from the CBO in goats. Equally important, the members have identify problems within the activity implemented, and realized the importance of working together.

The following commentaries represent the general perception from CBO members in Mungazi regarding lessons learnt from the revolving loan scheme, the importance of working together, and how to use the money repaid:

“... we didn't knew then, now we know that we should have bought first animals, and then after with monetary gains implement a revolving loans scheme” (MU01-OT)

“If all the members participate form the meetings and activities, once we have the money from the loans, we will be in the good path” (MU07-R)

“It is important for us to work hard in order to rescue the CBO” (MU06-R)

“For me, the CBO will be in a good path when the people with loan have returned the money, and with this money we will be able of buying animals, that would reproduce” (MU02-OT)

Table 39: Lessons learnt by the members of the CBO in Mabomo

LESSONS LEARNT	MEMBERS	Number of MEMBERS		
		Sum		(%)*
		R	O	
- Awareness of the importance of collective action for the CBO functioning;	MA02-O, MA03-OT, MA06-R, MA07-R, MA9-R, MA10-R	4	2	56
- Awareness of the CBO as a learning platform: Things that can only be learned in a group;	MA02-O, MA08-R, MA11-R	2	1	27
- Improvement of their skills in planning, implementing and PM&E an activity;	MA01-O, MA04-T	0	2	18
- About the activity	MA05-OT	0	1	9

* % of respondents, n=11; 12 answers; R: regular, O: official

Table 40: Lessons learnt by the members of the CBO in Mungazi

LESSONS LEARNT	MEMBERS	Number of MEMBERS		
		Sum		(%)*
		R	O	
- Importance of investing the CBO money in goats (they have bought three);	MU01-OT, MU02-OT, MU04-OT, MU05-RT, MU06-R, MU08-R, MU09-R, MU10-R	4	4	80
- Identification of problems in the community-based activity implemented;	MU01-OT, MU04-OT, MU05-RT, MU06-R, MU09-R,	3	2	50
- Awareness of the importance of collective action for the CBO functioning	MU01-OT, MU04-OT, MU06-R, MU09-R	3	2	40

* % of respondents, n=10; 18 answers; R: regular, O: official

5 DISCUSSION

5.1 DEVELOPMENT AND IMPLEMENTATION OF PM&E SYSTEM

The purpose of designing and implementing a PM&E system with the CBOs in Mabomo and Mungazi, was to promote learning and empowerment of the members. Another objective of the implementation of the PM&E system was to review the state of the activities implemented by the CBOs within the project “Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach”. Learning and empowerment outcomes for both CBOs are described in detailed below in this section.

5.1.1 PM&E Principles

The successful development and implementation of a PM&E system must be accompanied of a set of principles: (i) Participation and Collaboration; (ii) Context specificity; (iii) Inclusiveness; (iv) Learning; (v) Flexibility; and (vi) Empowerment.

In addition to these principles, (v) Iteration and (vi) Feedback and Discussion should be included to foster learning through the M&E process, as stated by Measham (2009). Furthermore, as stated by Guijt (2008), there should be a balance between (vii) Formality and Informality in the M&E. Finally, from a social learning perspective, (viii) Reflection should be included (Keen et al. 2005, Cundill & Fabricius 2009).

In the present study, all these principles were integrated into a flexible design, and applied during the process of development and implementation of the PM&E system in both CBOs. Figure 21 shows the proposed model used to integrate all PM&E principles into the five-step methodology. The five-step methodology is situated in the middle of the model. Principles attained in specific steps of the process are at the left side: Context specificity; balance between Formality and Informality; and Iteration. Principles implemented during the five-steps of the process are at the right side of the model: Inclusiveness; Participation and Collaboration; Feedback and Discussion, and Reflection. At the bottom of the model stands Learning and Empowerment, which are objectives of the M&E system (Guijt 1999, Hagmann et al. 1999, Estrella 2000, Mahanty et al. 2007), but also results from the process of developing it (Woodhill 2007, Guijt 2008).

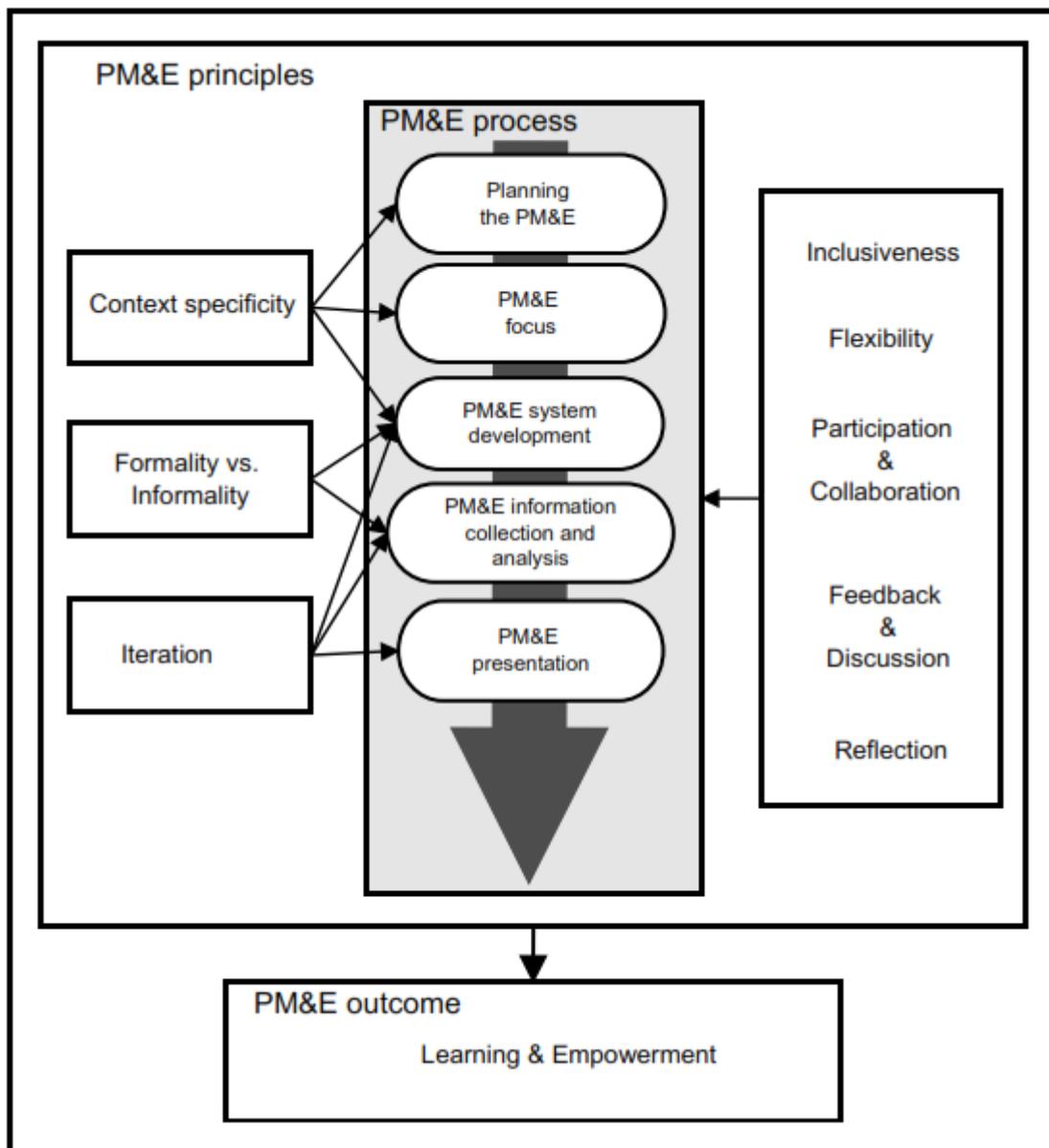


Figure 21: Model that integrates the PM&E principles to the development and implementation of the PM&E system. The five-step methodology is situated in the middle of the model. Principles attained in specific steps of the process are at the left side, while principles implemented during the five-step methodology are at the right side of the model. In the bottom stands learning and empowerment, which are objectives of M&E system, and outcomes.

The following paragraphs show in detail how these principles were integrated into the development and implementation of a PM&E system in the two CBOs.

To guarantee the *context specificity* of the PM&E process, the first steps in the development and implementation of the PM&E system (Step 1: PM&E planning, and Step 2: PM&E focus) were carried out in a general assembly (MA_G1, Table 15) in Mabomo and in a focus group

(MU_F1, Table 15) in Mungazi. The intention of having as many CBO members as possible involved in the decision-making process regarding the implementation of the PM&E system, was to have a greater chance of meeting the goals of empowerment and utilization, as stressed by Burke (1998). Furthermore, this first part of the process ensured that the PM&E was developed in a way that included the concerns and problems perceived by the CBO members regarding the implemented activities (section 4.1.1.1 STAGE 1: Review of reasons for PM&E), as well as their interests regarding the PM&E system (Table 18 and Table 19).

In Mabomo the participatory establishment of PM&E indicators (Table 20), and PM&E instrument (Figure 17), increased the ownership of the PM&E system. In Mungazi, even though the establishment of M&E indicators (Table 21) was done collectively by the PM&E team, the PM&E process did not fostered ownership; moreover, the PM&E team members were reticent of using a symbol-based instrument for the M&E of the revolving loan scheme (see below for explanation section 5.2.1, p. 85).

In both CBOs, after starting the PM&E system, informal processes, which incorporated everyday interactions, came into light. An example of such informal process in the CBO in Mabomo, is a typical commentary from the herder, which provided information to the rest of the CBO members regarding the state of the goat keeping activity:

“I participate by giving information of the goat keeping activity, because I am the herder. I told the group that we have now 10 new born, and how many females have reproduced and how many have not reproduced yet” (MA03-OT)

As an example of the informal process in the CBO in Mungazi, the commentary of one of the PM&E team members, described how they were dealing with collection and dissemination of the M&E information:

“What we are doing as Fiscals to have the money returned is that we divided the fiscals in the number of persons with a loan, so that each fiscal is in charge or responsible for a determined number of people with debts. With this, we will verify if the activities undertaken will guarantee that the money is going to return. We try to mobilize those with debts so that they pay” (MU03-O)

These two commentaries show how *informality* in M&E is not only crucial for ongoing sense-making, but also a source of information sharing, as stated by Guijt (2008). As recommended by Hagmann et al. (1999), and Guijt (2008), in both CBOs a balance between formal protocols and informal processes was facilitated specifically during two stages of the process: STEP 3: PM&E system development, and STEP 4: PM&E information collection and analysis. Indeed, in Mungazi, informal M&E occurring through oral transmission of information in daily interactions among CBO members was strengthened (see information

flow within the CBO in Mungazi, p. 63). In Mabomo, this balance helped to motivate CBO members, as well as it empowered them (Table 30).

Learning processes are iterative (Hagmann et al. 1999, Hagmann & Chuma 2000, Measham 2009). *Iteration* was part of the research design, by conducting repeated steps in which the PM&E team members had the opportunity to reflect and relate the process, as suggested by Hagmann & Chuma (2000), and Measham (2009). Iteration was especially important in STEP 4: PM&E information collection and analysis (see Table 15; activities in the CBO in Mabomo MA_F2, MA_G2; activities in the CBO in Mungazi MU_F2, MU_F3). It is also important to have iterative processes of presentation of the PM&E information (STEP 5: PM&E Presentation), nevertheless this was only possible once in Mabomo, and not possible in Mungazi.

The *flexibility* to adapt the methodology along the way according to the specific requirements and outcomes for each CBO is a crucial element of a M&E system (Estrella & Gaventa 1998, Guijt, 1999, Anandajayasekeram et al. 2008). In the present research, the implementation of the PM&E system was guided by a five-step methodology (Figure 14), contrary to a fix blueprint of how it should be done, making the whole process flexible per-se. The adaptations made to the original plans in order to fulfil the PM&E needs in Mungazi illustrate how the principle of flexibility was applied to the implementation of the PM&E in the present research. The PM&E in Mungazi was originally intended to focus on the revolving loan scheme. Nevertheless, it was adapted because the CBO members showed interest in a reflective process regarding the structure (meetings, decision-making, and compliance of rules) and function (distribution of benefits) of the CBO. The commentaries given by the PM&E team members during the analysis of the PM&E information demonstrates this interest (see section 4.1.4.2, p. 54-55).

A great deal of creativity, as suggested by Estrella & Gaventa (1998) and Anandajayasekeram et al. (2008), was necessary in the design of visual aids. For example, the M&E drawing (Figure 15) entailed an abstraction of a broad concept, M&E, into an applied context-specific strategy, M&E for a goat keeping activity and M&E for the revolving loan scheme. The design of the symbol-based instruments (Figure 17 and Figure 20), also required of creativity to represent the indicators with a symbol that the CBO members collectively interpret as the indicator.

During the PM&E process it was necessary of *inclusiveness* to reach agreement between CBO members, as stressed by Burke (1998), Estrella & Gaventa (1998), Guijt (1999), Anandajayasekeram et al. (2008). In Mabomo, participants reached agreements with respect to the PM&E system objectives (see section 4.1.2, p. 49; Table 26), the set of indicators to

be used during the process (Table 20), the symbols to be used in the symbol-based instrument (Figure 17), and the re-adjustment of the PM&E instrument (see section 4.1.4.2, p. 54). In Mungazi, participants reached agreements with respect to the PM&E system objectives (see section 4.1.2, p. 50; Table 26) and, the set of indicators to be used during the process (Table 20). Nevertheless, it was not possible to have agreement upon the CBO members to establish rules for the revolving loan scheme, or a symbol-based instrument to register the PM&E information from the revolving loan scheme.

The process of designing M&E plans fostered *participation and collaboration* between both the PM&E team members and the other CBO members, as described by Burke (1998), King et al. (2007), Mahanty et al. (2007), and Cundill & Fabricius (2009). Participation and collaboration was specially promoted by opening to all CBO members the possibility of being part of the PM&E team (see section 4.1.1.2, p. 48). Likewise, in Mabomo, CBO members different from the PM&E team collaborated during the analysis of the M&E information (see section 4.1.4.2, p. 54). As stressed by Cundill & Fabricius (2009), this collaboration increased the validity of the M&E information collected, and reinforced the M&E analysis. During the collective SWOT analysis performed in Mabomo (Table 24), CBO members stressed they perceived the PM&E system as an advantage of the CBO. This reflects ownership and responsibility. Estrella & Gavent (1998) also accounted an increased ownership and responsibility to participation and collaboration processes.

In Mungazi, the participation and collaboration space opened by the implementation of the PM&E system gave the opportunity to some CBO members to express themselves and reflect, as for example during the PM&E information analysis (see section 4.1.4.2, p. 54-55). During this space, the PM&E team members stated that they need to work together, use the money they currently have in buying animals, not focus all their energy in the repayment of the loans, and have someone in charge of the CBO when the president and vice-president are absent.

Feedback and discussion allowed participants to analyze and interpret the information generated from the PM&E system in a collaborative way. In Mabomo, as the PM&E team members met regularly (MA_W, MA_F2, MA_F3, MA_G2, see Table 15) to cross-check and verify the information collected, they had the opportunity to discuss the meaning of the information previously collected by them, as suggested by Burke (1998). In this way, the feedback product of these discussions served as input for the CBO functioning. An example is the validation of the instrument, and the decisions regarding the outcome of goat keeping activity: (i) the distribution of one female goat to each active member after having enough goats, and (ii) the use of the money from the sale of male goats in a rotational loan scheme (see section 4.1.4.2, p. 54).

Most M&E guidelines underestimate processes to analyse, *reflect* and interpret information (Guijt 2008). The present research included an active facilitation to stimulate high-order thinking processes among the CBO members in both CBOs. This was done by constantly questioning statements and beliefs regarding the collection and analysis of the PM&E information, using a pre-established set of guiding questions (Table 16).

Reflection in a social learning context refers to the thoughtful thinking on the learning that has taken place during a given process, using that reflection to stimulate more learning (Keen et al. 2005). In this sense, in both CBOs emphasis was made on the reflection not only on objectives, actions and outcomes, but on the lessons learnt by the CBO members from the implementation of the activities as well as from the PM&E process, as shown in Table 39 and Table 40.

Learning and *empowerment* are important principles of M&E process. They come together, as the iterative learning cycles of action and reflection also empower CBO members (Blackstock et al. 2007, German & Stroud 2007). In both CBOs the internal accountability was strengthened during the PM&E process (Table 39 and Table 40), also reported by Burke (1998), Estrella & Gaventa (1998), King et al. (2007), Mahanty et al. (2007), Anandajayasekeram et al. (2008). Specifically, in Mabomo the PM&E team members stressed they improved in project management skills (Table 39), as also is illustrated by the following commentary:

“We learnt to do thing in practice and in thinking. We have been planning and doing and that’s the most important thing I have learnt” (MA04-OT)

In Mungazi during the implementation of the revolving loan scheme, CBO members perceived they have improved in decision-making, problem-solving, and allocation of resources (Table 40), as illustrated by the following commentaries :

“... we didn’t knew then, now we know that we should have bought first animals, and then after with monetary gains implement a revolving loans scheme” (MU01-OT)

“If all the members participate form the meetings and activities, once we have the money from the loans, we will be in the good path” (MU07-R)

“For me, the CBO will be in a good path when the people with loan have returned the money, and with this money we will be able of buying animals, that would reproduce” (MU02-OT)

5.1.2 PM&E and learning

Incorporating social learning principles and practices in M&E process promotes collective action, critical reflection, and increase knowledge sharing (Cundill & Fabricius 2009, Measham 2009). Clarifying and specifying learning goals is important if learning processes are to be linked to learning outcomes (Collins & Ison 2009b, Cundil & Fabricius 2009), moreover if scaling up is to be based on promoting process of learning (Hagmann & Chuma 2000). CBO members in Mabomo and in Mungazi have learnt different lessons during the period in which they have implemented the community-base activities. Table 41 presents examples extracted from the results of the present research of learning outcomes using evaluation parameters proposed by Plummer & Armitage (2007), and following the concepts of single-loop, double-loop and triple-loop learning (Agyris and Schön 1978, Maarleveld & Dabgbagnon 1999, King & Jiggings 2002, Armitage 2007).

Table 41: Assessment of learning outcomes for the CBOs in Mabomo and Mungazi

EVALUATION PARAMETER*	CBO in MABOMO	CBO in MUNGAZI
Shared actions are undertaken	<ul style="list-style-type: none"> - Purchase of goats and construction of their corral; - Cutting of poles for a traditional pig corral; - Construction of an improved corral for pigs according to the new plans (currently under development) 	<ul style="list-style-type: none"> - Establishment of a revolving loan scheme; - Construction of goat and pig corral
Modifications are made in an on-going process of reflection	<ul style="list-style-type: none"> - Designed and implement a PM&E system; - Willingness to implement the PM&E system for other activities 	<ul style="list-style-type: none"> - Designed and implement a PM&E system; - Willingness to implement the PM&E system for other activities
Single-loop learning Improvement / How to do	<ul style="list-style-type: none"> - Re-adjustments and improvements in the PM&E system; - Improvement of their skills in planning, implementing and PM&E an activity 	<ul style="list-style-type: none"> - Money from the revolving loan scheme is returning to the CBO; - Identification of problems in the community-based activity implemented
Double-loop learning Reframing / What to do	<ul style="list-style-type: none"> - Willingness to innovate in livestock management practices: construction of an improved corral for goats and improved confined pig rearing 	<ul style="list-style-type: none"> - CBO started buying animals to implement a second activity;
Triple-loop learning Transforming / Why we do what we do	<ul style="list-style-type: none"> - Awareness of the importance of collective action for the CBO functioning; - Awareness of the CBO as a learning platform; - Awareness of the importance of having plans so that all CBO members can benefit; - Awareness of the importance of having short-term and long-term benefit 	<ul style="list-style-type: none"> - Awareness of the importance of collective action for the CBO functioning; - Awareness of the importance of having plans so that all CBO members can benefit

* Evaluation parameter based on Plummer & Armitage (2007)

Following the PM&E learning cycle proposed by Woodhill & Robins (1998), and described before in this study (see Section 3.3.1, Figure 10), it was possible to reconstruct several iterative cycles for each CBO. Figure 22 present two examples of exploration, analysis, decision-making, action and reflection for the CBO in Mabomo. These cycles were constructed for (i) the creation of the PM&E instrument and data register, and (ii) validation of the PM&E instrument. The creation of the PM&E instrument is described in section 4.1.3 STEP 3: PM&E system development. The validation of the system is described in section 4.1.4.2, p. 54.

In the CBO in Mungazi, a cycle of exploration, analysis, decision-making, action and reflection was also evident. Figure 23 presents an exemplifying learning cycle from the self-evaluation process in the CBO in Mungazi. The CBO members learned from their own experiences participating in the CBO, nevertheless it was difficult for them to implement corrective actions.

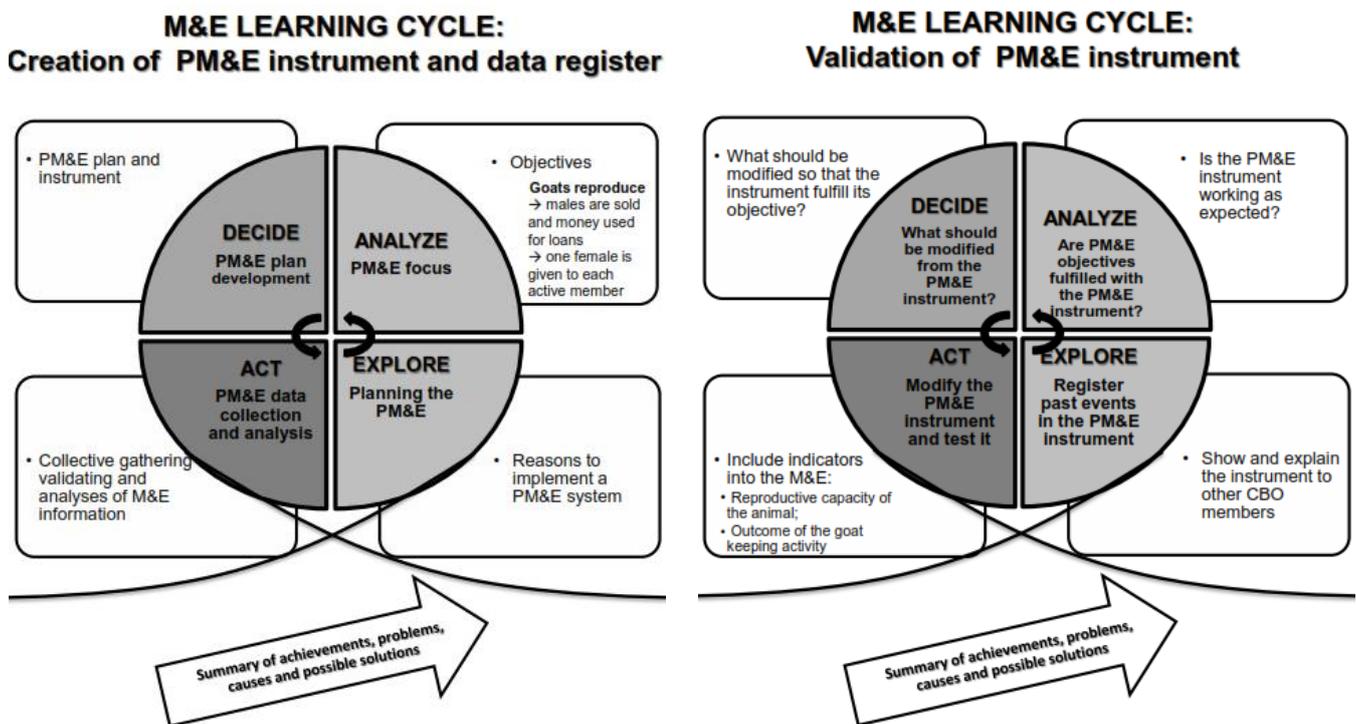


Figure 22: PM&E learning cycle (based on Woodhill & Robins 1998) for the CBO in Mabomo: creation of the PM&E instrument and data register (left), and its validation (right)

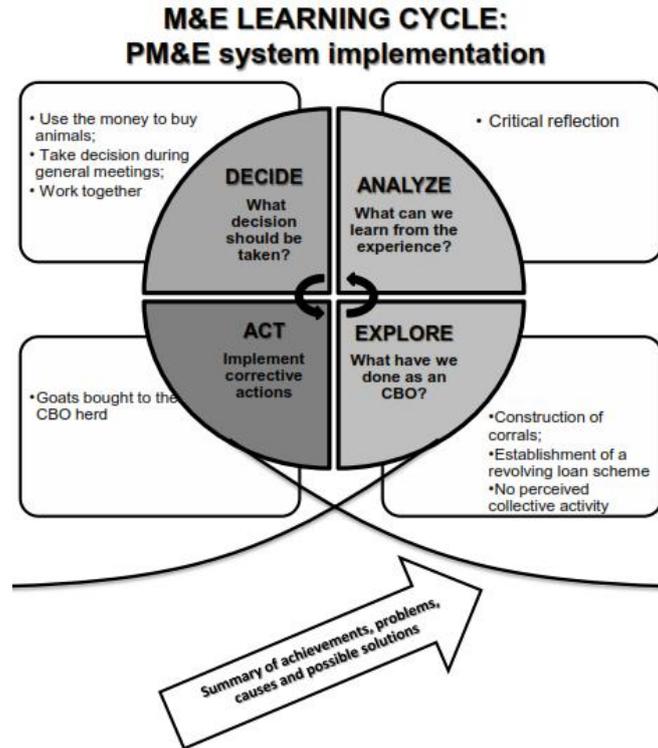


Figure 23: PM&E learning cycle (based on Woodhill & Robins 1998) for the CBO in Mungazi

5.2 IS THE PM&E SYSTEM AN EFFECTIVE INSTRUMENT TO SUPPORT COMMUNITY-BASED ACTIVITIES?

If a PM&E system effectively supports community-based activities, then it has greater probability of being sustainable in time. Sustainability of the PM&E system, as described by Guijt (1999) and Cundill & Fabricius (2009), depends on the information collection, analysis, and dissemination processes; end-users' perceived benefits of the system and desire to extend it; actions that result from it; and the learning intrinsic to the process. The present process was designed by thinking on key factors that may enhance PM&E effectiveness in supporting community-based activities.

5.2.1 Handling of PM&E information gathering and analysis by the PM&E team members

In Mabomo, considerable time was devoted to collectively establish indicators (Table 20) and to create the PM&E instrument (Figure 17). The indicators selected by the PM&E team are congruent with those aspects that should be M&E to improve communal goat production systems in Southern Africa, according to Rumosa et al. (2009): body condition, reproductive capacity, and flock dynamics. Several sessions were dedicated to fill-in the instrument, re-adjust it, and analyse the information generated (MA_W, MA_F2, MA_F3, MA_G2, see Table 15), which were planned as iterative cycles of action and reflection following Woodhill

& Robins (1998), Hagmann et al. (1999), Hagmann & Chuma (2000), and Measham (2009). During the analysis of the PM&E information collected in Mabomo, the PM&E team members were able of assessing mortality rates, birth rates, reproductive status of females, flock dynamics and expected outcomes from the activity (see section 4.1.4.2, p. 53).

In Mungazi, on the other hand, the PM&E team were reluctant of conducting the PM&E of the revolving loan scheme using a symbol-based instrument. CBO members felt they have not done a collective activity (Table 29); only 10% of the interviewed members see the revolving loan scheme as an activity implemented by the CBO. This explains why the PM&E team was reluctant to continue the PM&E of the revolving loan scheme. Bayer & Water-Bayers (2002), and Ngutu (2010) also reported unwillingness among remote communities to base the PM&E on symbol-based instruments. Nevertheless, during the analysis, the PM&E team members were able of assessing the fraction of the money used in the revolving loan scheme and repayment rates. The new approach used to implement the PM&E system in Mungazi, based on the self-reflection of the CBO members, was also reported as successful for illiterate pastoralist societies (Hagmann & Chuma 2000, Bayer & Waters-Bayer 2002).

5.2.2 Usefulness of the PM&E system

Among others, the effectiveness of a PM&E is based on sharing information (Guijt 1999), because of the close link between information gathering and decision-making (Cundill & Fabricius 2009), which in turn supports community-based activities. For this, information channels should be strengthened when already existing, or if necessary created (Burke 1998, Hagmann et al. 1999, Guijt 2008).

In Mabomo, all CBO members interviewed showed to be accurate informed of the activities performed and the short-term plans (Table 28). Having all the interviewed members recall the short-term plans shows the importance of meetings and the decision-making process for the CBO, where planning and daily issues is treated. CBO members were also informed of the process the PM&E team is leading (see section 4.2.2.1, p. 62). On the contrary, long-term plans are not as fresh for the CBO members, with only 18% of the interviewed members recalling them. This also shows the dynamics in general meetings, where a discussion is generated among the CBO members before implementing a new activity, while long-term plans are not longer touched. The following commentary regarding the implementation of a revolving loan scheme in Mabomo exemplifies the previous asseveration:

“...The rest of the details related of the revolving loan scheme are to be discussed in a plenary meeting that shall take place when we gather enough males” (MA_F3)

Information flow regarding the activities implemented in Mungazi is not homogeneous; 50% of the interviewed members claimed they have not done any activity as a CBO, while only 10% see the revolving loan scheme as an activity (Table 29). The same is true for short-term plans (except buying goats, with 90% of the interviewed members recalling it), and long-term plans (Table 29). The president and vice-president of the CBO are constantly out of the village, and the monthly general meetings were not performed, as stressed by a CBO member:

“What makes conflict in the CBO is the lack of coordination with the president and vice-president, because they are absent for long periods, and then when they return, they do not agree on the decision that were taken by the rest of the members” (MU01-OT)

In Mabomo and Mungazi, CBO members show desire to extend the application of the PM&E by having a similar system implemented for other activities, like the veterinary pharmacy (see Section 4.2.2.2). In addition, the PM&E team in Mabomo started planning for a PM&E system for the pig keeping activity in improved confined conditions (Figure 20).

5.2.3 Appropriateness with regard to the different group activities

For a PM&E process to effectively support community-based activities, it should generate new knowledge and be perceived as beneficial by the CBO members (Guijt 1999, Cundill & Fabricius 2009).

In Mabomo, the PM&E system is in fact helping to generate new knowledge, both from the PM&E process itself, but also from the activities implemented. On one side, the PM&E team members perceive they improved their skills to plan, implement and follow a PM&E system (Table 39). At the same time, the innovative aspect of the activities to be implemented in the CBO in Mabomo (pig rearing in improved confined conditions and improve corralling for goat keeping), provide an opportunity of generating new contextualized knowledge for the CBO members, concerning goat keeping and pig rearing management strategies. This ability to learn from both shared and new knowledge is critical to the process of innovation (Olsson et al. 2004).

In Mabomo and in Mungazi, CBO members perceived they are obtaining a benefit from the PM&E system (Table 30), which Symes & Jasser (2000), and Cundill & Fabricius (2009) evoke as a motivational aspect. Interviewed members in Mabomo remark the possibility that the PM&E system is giving them to keep track of how the goat keeping activity is, and apply corrective actions if needed. In Mungazi, such benefits are recognized by the CBO members

as the opportunity the system is giving them to be aware of the problems within the CBO, and the desire to address them.

During the implementation of the PM&E process a set of tools were used to motivate PM&E team members, and in general all CBO members, following the hypothesis that the creation of an emotional environment in which the participants feel at ease is fundamental in social learning process (Rist et al. 2006). The tools that gave better results are described below.

Visual aids used during focus groups and workshops (M&E drawing, Figure 15; Symbol-based instrument, Figure 17 and Figure 20; SWOT analysis, Figure 18) helped in calling the attention of the participants, and increasing participation. Opening the possibility of the members to express themselves, assisted them in feeling owners of their own processes (inclusiveness principle, p. 89), which at the same time increased responsibility, mostly within the PM&E team members in Mabomo. During the focus group, meetings and workshops, facilitation of critical reflection among CBO members (see Guiding questions, Table 16), increased their motivation, as also stated by Hagmann & Chuma (2000). Furthermore, the perceived usefulness of collecting and analysing PM&E information also increased the probability that inconsistencies or missing elements in the PM&E instrument were detected, as with the validation of the PM&E instrument in Mabomo (section 4.1.4.2, Figure 22).

5.3 WHAT ARE KEY OPPORTUNITIES AND BARRIERS FROM THE CBOs TO ENABLE COMMUNITY-BASED ACTIVITIES?

The success and sustainability of community-based activities depends on the structure and functioning of the CBO in which such activities have been implemented. The structure of a CBO is related to the compliance and sanctions, decision-making, participation in group activities, and role of leaders. The functioning of a CBO depends of the benefits and contributions, and perception of a good working group. Following the main discussion points regarding the structure and function of each CBO are outlined.

5.3.1 CBO Structure

Community-based activities require of rules and norms for collective decision-making, which can define and ensure local compliances (Weinberger & Juetting 2001). Mutually agreed rules, norms and sanctions are central aspects of social capital (Pretty & Ward 2001, Ostrom & Ahn 2003, Pretty 2003). Sanctions, besides, ensure that those who are breaking the rules know they will be punished (Pretty & Ward 2001, Ostrom & Ahn 2003, Pretty 2003). Both for the CBOs in Mabomo and in Mungazi, regular and official members perceived the most common non-compliance is the not participation in meetings and activities (Table 31). In

Mabomo, indeed, one CBO members was expelled of the CBO for his recurrent absences, while in the CBO in Mungazi no sanctions have been imposed (Table 33).

In Mungazi, as stated by an interviewed member (MU02-OT, p. 69), poor participation in meetings and activities is explained because the CBO members, as the rest of the village, are occupied in different activities to achieve their livelihood. In Mungazi there is a limited ability to bear the short-term cost of participation. Since community-based activities involve some type of livelihood risk, such as the time spent (Armitage et al. 2008), strategies to counteract this risk, and enable participation should be look for. One example, is having both short-term and long-term goals (McAllister 2001, Weinberger & Juetting 2001), as planned in the CBO in Mabomo (see section 4.3.2.1, p. 71).

Community-based activities require attention to group processes, particularly in decision-making process (Blackstock et al. 2007). A strong, motivating CBO should involve all members in decision-making and represent their interests (Hagmann et al. 1999). The present study illustrates both situations, where decisions are taken collectively and where they are not.

The plans for the next activities/months reflect the process of decision-making within the CBO in Mabomo. Here, during general meetings CBO members decide what activity to implement and discuss on how the implementation is going to be (Table 33). All CBO members interviewed in the village of Mabomo perceived decisions are taken collectively (Table 32). In Mungazi, 80% of the official members perceived they are taking decisions collectively, while only 40% of regular members agreed (Table 33). According to the regular members (see commentary MU01-R, p. 69), official members took by themselves important decisions, and only informed the rest of the CBO members after implemented, as with the case of the revolving loan scheme. In addition, regular members stated that the decisions that were taken collectively have not been implemented (Table 33). The fact that the decisions regarding the revolving loan scheme were not taken collectively elucidates why only 10% of the interviewed members perceive the revolving loan scheme as a CBO activity (Table 29), and why, even when the delay in the payment of the loans is a conflicting issue, none of the interviewee members stated as non-compliance (Table 31).

A successful CBO processes requires trust, based on existing relationships, and the strength of traditional leaders (Butler & Mazur 2007). Anandajayasekeram et al. (2008) also described leadership as a primordial factor in the success and sustainability of any group. While in Mabomo the CBO leaders are committed and working to see the well functioning of the CBO, in Mungazi the CBO leaders have failed to carry out their functions (see commentaries MU01-OT, MU05-RT, p. 69). Some leadership problems present in the CBO

in Mungazi, and also described by Anandajayasekeram et al. (2008) as a source of failure for CBOs are: (i) take up leadership positions for self-gain; (ii) lack leadership knowledge and skills; (iii) fail to motivate followers; (iv) abusing their authority; (v) or absentee leaders—not always available to the people.

According to Ostrom and Ahn (2003), trust, as a form of social capital, is the most inclusive factor in facilitating collective action. At the same time, a proper decision-making process, and an appropriate leadership also increase trust, and therefore the facilitation of collective action. According to Rist et al. (2006, 2007), trust is enhanced in the first steps of social learning process.

In Mabomo the pre-conditions for implementing the PM&E system were favourable. The performance and structure of the CBO facilitated the recurring meetings and decision-making process within the PM&E team. The CBO fiscals supported with enthusiasm the PM&E process, as they perceived it as part of their functions. Finally, the leader of the CBO showed always disposition towards the process and the strengthening of the CBO. PM&E process increased trust among CBO members in Mabomo, which enhances social capital and therefore strengths collective action and community-based activities. One weakness from the process in Mabomo is that the PM&E work-load is unequally distributed upon the CBO members.

Besides the desire of the CBO fiscals, which perceived the PM&E as part of their factions, there were not many favourable pre-conditions for implementing the PM&E system in Mungazi. The low priority given to PM&E process, due to the frustration felt by the CBO members was a major obstacle. The feeling of frustration was originated by the distribution of the loans (financed with the funds provided by the project), their low repayment rate, and the delay in the implementation of the other activities. Furthermore, the PM&E uncovered group problems such as slight disposition of the leaders, which were not present in the village during the process. This in turn obstructed the development of general meetings. With no general meetings, the information flow was not properly established and, decision-making processes was deficient.

5.3.2 CBO performance

Performance is the synthesis and result of the way in which the CBO uses its capacities, builds motivation, and deals with its environment (Carden 2000). In the context of this research, what makes collective action important is that it helps regulate the acquirement of benefits in community-based organizations, and in this way is related to its outcome. CBO members in Mabomo and in Mungazi perceive the good performance of the CBOs depend on the success of the activities and their capacity to work together (Table 36 and Table 37).

In Mabomo, 'how to benefit' is a very important issue, and there is a positive conflict among the CBO members with this regard, as illustrated by the following commentary:

"There are some that want to have short-term benefits, but when they don't have it, then the motivation decreases and they are not so happy of being a member of the CBO" (MA03-OT)

'Benefits' have generated an open discussion among the CBO members, which in turn improved the quality of decision-making process, as stated by Anandajayasekeram et al. (2008). In addition, in Mabomo CBO leaders are aware of the importance of having a balance between short-term and long-term benefits, to have the members motivated (see section 4.3.2.1). Perceived short-term benefits guarantee that the CBO members are motivated by their success and encourage further action (Hagmann et al. 1999). In this way, the perception of potential benefits by the CBO members in Mabomo influence individual and collective motivation to participate in community-based activities.

In Mungazi, on the other hand, there are no official plans of how to achieve a collective benefit, even when there is some discussion around this topic, as illustrated by the following commentary:

"all the members of the CBO should have access to benefits" (MU04-OT)

Besides, those benefited by the revolving loan scheme were official members (Table 35), what have brought conflict to the CBO.

6 CONCLUSIONS AND RECOMMENDATIONS

A PM&E system designed as an iterative exercise of exploration, analysis, decision-making, action and reflection, was implemented in two CBOs in rural Mozambique. The successful development and implementation of the PM&E system was based on the following principles: (i) Participation and Collaboration; (ii) Context specificity; (iii) Inclusiveness; (iv) Learning; (v) Flexibility; (vi) Empowerment; (v) Iteration; (vi) Feedback and Discussion; (vii) Formality and Informality; and (viii) Reflection. These principles allowed CBO members to be owners of their own PM&E process.

The development and implementation of the PM&E system was successful in increasing the active-learning possibilities of the CBO members. It promoted learning and empowerment among the CBO members. The PM&E process brought forward evidences of the learning processes that was taking place as the CBOs implemented community-based activities. Learning outcomes that require critical reflection were identified for both CBOs. These include single-loop learning such as improvement in skills to plan, implement, and M&E activities; double-loop learning such as willingness to implement innovative activities; and triple-loop learning such as awareness of the importance of collective action.

PM&E process showed to support moving from single loop learning to double and triple-loop learning. Learning outcomes were related with the M&E findings and with the experience gained through the process.

In Mabomo, the PM&E team members were empowered with their role in the PM&E process. They showed their own initiative in filling and analysing the PM&E information. With the PM&E process, CBO members in Mabomo enhanced and fortified their skills to collect and analyse information as well as to plan, implement and follow a PM&E. They learned from the experience gained through the iterative cycles of exploration, analysis, decision-making, action and reflection.

In Mungazi, even though the PM&E process fostered important reflections for the CBO members, there were no own initiatives, and the PM&E members did not felt empowered enough to continue without a facilitation process.

In both CBOs the interviewed members stressed their desire to have a PM&E implemented for other activities, such as the veterinary pharmacy and the pig rearing in improved confined conditions. The desire to implement the PM&E system for other activities ratifies the perceived benefit of the PM&E process among CBO members.

Furthermore, in Mabomo, the PM&E process showed to be a motivational aspect that acted as a positive feedback to community-based activities. It motivated additional efforts to continue with the goat keeping activity and its corresponding PM&E system. The collection and dissemination of the PM&E information within the CBO in Mabomo strengthened the decision-making processes, which in turn enhances community-based activities.

The PM&E process created opportunities for consensus building, collective sense making and action in both CBOs. Key factors from the CBO to enable community-based activities were trust, leadership and transparent decision-making processes

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8 APPENDICES

8.1 Appendix 1: TOOLS

Planning the evaluation

1. Review reasons for evaluation, general meeting:

- a) To introduce the group to the concept of monitoring and evaluation modified from German et al., (1996) (figure 1) was used,

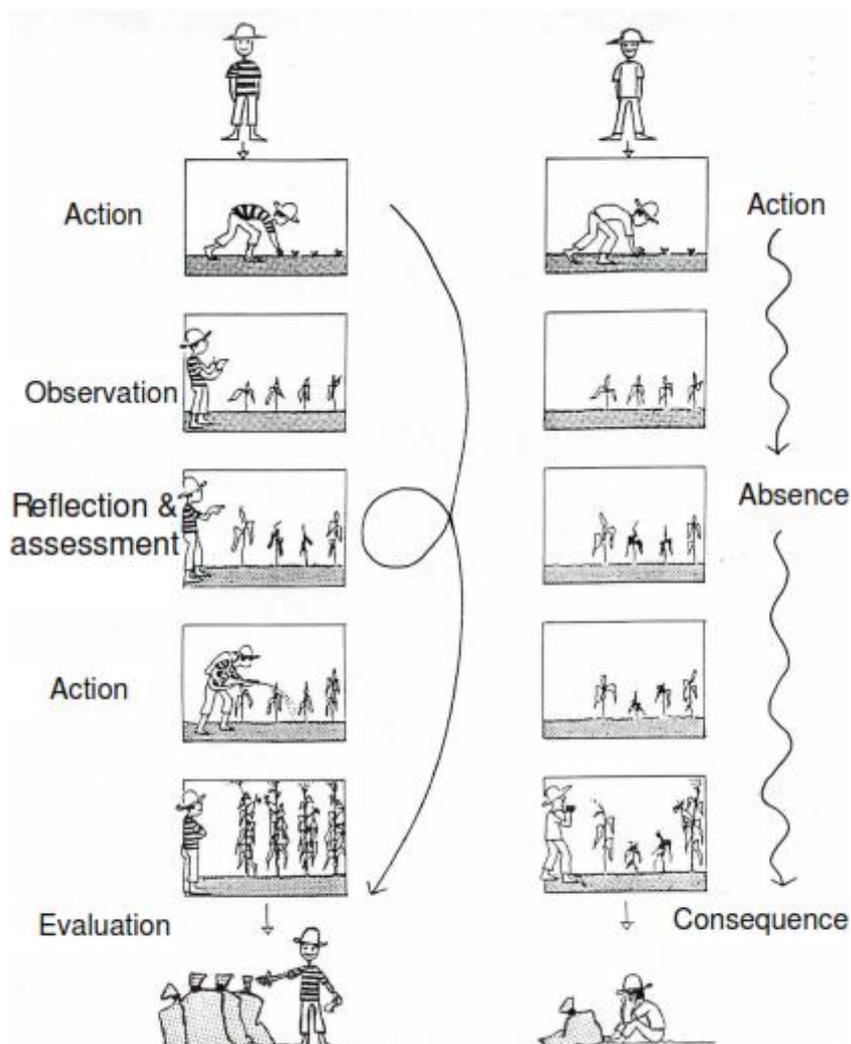


Figure 1: M&E drawing used during the evaluation-planning meeting. Modified from Germann & Ghol 1996, Booklet 1,5

After decoding the drawing decoding, the participants are asked to discuss the following questions (modified from Burke, 1998; Slocum, 2003):

1. Why is important to conduct an evaluation?
2. What is that they want to learn?

3. What information we want to know from our activities? And, what we want to get out of the M&E?

5. Who wants to know what and why?

6. When and how is the monitoring and evaluation system going to be implemented?

b) As a final reflection the facilitator states the key principles of a participatory monitoring and evaluation system (Rietbergen-McCracken and Narayan, 1998):

“Is a process of collaborative problem solving through the generation and use of knowledge. It is a process that leads to corrective actions by involving all participants in shared decision-making”

“Community is active participants”

“Focus on building capacity for analysis and problem-solving, reflect, analyze and take responsibility for implementing any change”

c) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

2. Who will do the evaluation, general meeting:

a) Build consensus and agreement to assign responsibilities and duties within the group

- CBO members: Review the reasons for evaluation and provide the evaluation focus or guidelines
- M & E team: M & E plan development, data gathering and analyzing, presenting in plenary (to the village)

Groups discuss the questions (modified from Slocum, 2003):

Who should participate in M&E team?

Who can provide and who needs what information, and in what form?

How will information be disseminated and stored so it is accessible for anyone?

b) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

Evaluation focus

3. Develop evaluation question, general meeting:

The objective is to collectively identify the focus of the evaluation and the parameters to be evaluated

Procedure (modified from Cramb and Purcell, 2001:12; Gleifus, 2008:185):

- a) Explain the objective of the meeting and reach consensus.
- b) Analysis of expectations and fears about actions scheduled. The following questions allow the group to expand their vision and enrich the search for indicators.

1. What are our expectations (expected results) and fears (potential problems) about the activity?,
 2. What are objectives of the activity?, and why is the activity important?,
 3. How do we measure “success” of the activity?,
 4. How is the activity contributing to cope with the objectives of the organization (prioritized problem)?,
- c) List what you would like to see from the M&E system, the objectives and goals
 - d) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

Monitoring and Evaluation plan development

4. M & E system development, workshop

The objective of this workshop is to draw a symbol based instrument which includes the principal indicators that will be used to M&E the success of the activity. During this workshop, the team will decided who will do the measuring (responsibilities) and when (timeline).

Procedure (modified from FAO, 2003; Gleifus, 2008:185):

- a) Present and reach consensus on methodology.
 - b) Based on the evaluation focus determined in general assemble, the M & E team will develop the instrument based on the answer for the following questions:
 1. How can we observe progress of the actions/ activity?
 2. What information we need to take corrective actions?
 3. What other information is needed to track the activity?
 4. Who should observe the different indicators?
 - c) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.
- #### 5. Re-adjustment, focus group:
- a) Groups discuss the question (modified from Slocum, 2003):

Have new questions arisen that required additional collection of information?,

What are the different options available to address the emerging issues?

→ Discourage the group from focusing on blaming, or accusation from any poor result. Instead orient the discussion around the future, exploring new and better plans toward the desired future. If additional info is needed to answer a new question, hen devise a plan to gather the needed data.
 - b) **Ask the participants what they think about the exercise.** Write down the result and give

the sheet of newsprint or a copy of the results to the group.

6. Data analysis, focus group:

This should be a repetitive process, as it entails repeating, at specific intervals, the stages of action (project implementation), observation (monitoring of indicators), and reflection (analysis of results of the observation and proposed adjustments and corrections).

a) Groups discuss the question (modified from Cramb and Purcell, 2001:12; Slocum, 2003):

Why was the particular information necessary?,

What questions was it to answer?,

What kind of decisions are to be made based on this information?

b) The exercise should be repeated for the different indicators

c) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

7. Loan effectiveness

a) Explain the objective of the meeting to the participants.

b) The participants are first ask to describe the loan activity

c) Based on the information previously given, facilitate a discussion

Groups discuss the question (modified from Slocum, 2003)

What kind of decisions are to be made based on the experience?

How can we learn from the results?,

How can we learn from the process?,

d) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

8. Rules for the loan activity

a) Explain the objective of the meeting to the participants.

b) In a big cardboard write the names of all the members, and then write symbols to represent who's having a loan, who has paid and for what the loan was given or the objective of the loan (charcoal production, wood, or for grocery).

c) Groups discuss the question:

How much money from the CBO will be used for loans and how much will be invested in animals?

How many members will have a loan in each time frame (year?)?

Based on what criteria members are going to be the selection for a loan? It is important not having a loan before, participation, payment of fees, and objective of the loan.

What will be the maximum of money given to a single person?

- d) With the information from the discussion re-do the rules for loans based
- e) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

Presentation and action plan

9. Presentation and action plan, focus group:

- a) Groups discuss the question (modified from Slocum, 2003):

What conclusions can be drawn?,

How can we learn from the results?,

How can we learn from the process?,

→ Discourage the group from focusing on blaming, or accusation from any poor result. Instead orient the discussion around the future, exploring new and better plans toward the desired future. If additional info is needed to answer a new question, then devise a plan to gather the needed data.

- b) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

Analysis

10. SWOT, general meeting

The objective of the exercise is to conduct an ex ante evaluation of the group activities, to try to compare advantages and disadvantages, and foresee possible problems. SWOT methodology is a whole system; in this case, a very simplified design is presented (Gleifus, 2008:161).

Strengths were defined as any group characteristics that could enhance the chances of the group's success in meeting their objectives while weaknesses were defined as the group characteristics that were likely to lead to failure in achievement of group objectives. Both strength and weaknesses are inherent to the group.

Opportunities were defined as situations in the groups' environment, which the group could utilize, to better achieve their objectives while threats were identified as situations in the groups' environment that made it difficult for the group to meet their objectives. Both opportunities and threats were seen as being external to the groups. The results from the analysis are described below.

- a) Describe the objective of the analysis
- b) Groups discuss the question (modified from Gleifus, 2008:161):

Strengths: What are the advantages of the CBO for the success of the activities?

Weaknesses: What are the disadvantages of the CBO for the success of the activities?

Opportunities: What external elements (in the village, society, institutions, and natural environment) could positively affect the outcome of the activities?

Threats: What external elements (in the village, society, institutions, and natural environment) could negatively affect the outcome of the activities?

- c) **Ask the participants what they think about the exercise.** Write down the result and give the sheet of newsprint or a copy of the results to the group.

8.2 Appendix 2: PM&E ASSESSMENT

- Did you received information about the M&E process?
- Do you think the M&E instrument offers important / useful information? Which? Why?
- Was the information collected using the M&E system analysed?
- Which were the principal conclusions / recommendations the analysis?

8.3 Appendix 3: PERFORMANCE INQUIRY⁴

- How often do you attend meetings? Did you attend to the last meeting?
- Why do you decide sometimes not to go?
- Are the issues debated of your interest? Which are?
- Do you participate in the discussions during the meetings? Give me an example of your participation.
- When you have an opinion, can you easily expose it?, Is your opinion taken into account?
- How are decision taken in the CBO?
- How are different opinions taken into account?
- Which issues raise conflict?, How is this overcome?
- How is the issue of fees going?
- Have you broken any rule?
- Which "rules" are mostly broken? - Why?
- How are "rule-breakers" treated?, Has there been any punishment for any rule-breaking?
- Can you tell me about the activities that the group members have conducted during the past months?
- Have these activities been conducted as planned? Why?
- Which kind of problems have you faced?, Did the group members manage to solve the problem? how?

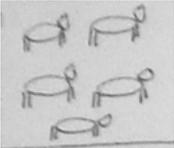
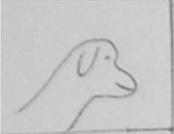
⁴ Modified form Levy 2011

- What is the current state of the activities?
- What is the plan for the activities for the following months?
- Did you participate in this month CBO's activities?
- What do you think that is the benefit of being a member?
- Have you already benefited directly in any form from being a member?
- Name the records that should be kept by the Group?, Are all the records being kept?
- What does it mean for you if the group performs well?, How is this monitored
- How is your role in the group?

8.4 Appendix 4: SYMBOL-BASED INSTRUMENTS

1. Goat keeping activity in Mabomo, PM&E symbol-based instrument



SYMBOL	INDICATOR	SYMBOL	INDICATOR
	Total number of goats		Action:
	# newborns		# of animals de-wormed
	# of females that have reproduced # of females that have not reproduced		# of animals vaccinated
	# males		# of animals with other treatments
	# healthy animals		Traditional corral
	# unhealthy animals		Improved corral



healthy animals



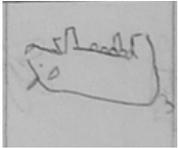
unhealthy animals



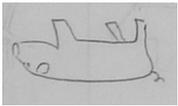
Total # deaths



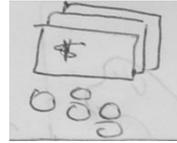
deaths newborns



deaths females



deaths males



males sold for loans

Money received from each male sold