CHAPTER 5

Provisional Development Plan and Verification Projects

CHAPTER 5 DEVELOPMENT FRAMEWORK AND VERIFICATION PROJECTS

5.1 Development Framework and Formulation of Integrated Program

5.1.1 Top-Down Approach and Bottom-UP Approach

The Master Plan was prepared by sitting down with the local communities and GOK officers as well as the relevant stakeholders. Although the Plan was prepared with the active participation of the people, that is, using the so-called bottom-up approach, one thing we must not forget is to apply some top-down approach in order to get the Study Area to fit into a broader regional development plan as well as to gain a sound overview of the Study Area taking into consideration its environmental carrying capacity.

The bottom-up approach would identify community-based projects, through which the problem(s) the communities are now facing may be solved. However, the solution might be unnecessarily shortsighted or localised; an example might be an irrigation development implemented upstream without considering the effect downstream. Although some interventions have already been made during PCM workshops, those community-based projects may still have to be fitted into a context of sound regional development.

The Team has, on the other hand, taken a somewhat broader view, going beyond the communities, by viewing the Study Area as a whole, and reviewing relevant development plans, as well as learning lessons from past experience. The Team has also conducted an assessment of the resources people have and forecast the future were no intervention to take place. These practices could contribute to preparing a balanced development plan, and could also make it possible to outline a framework, defining the carrying capacity of the Study Area, within which any development should occur. This is the so-called top-down approach.

This Study therefore tries putting both approaches together in formulating the Master Plan. Figure 5.1.1 shows conceptually how both approaches apply to formulating the Plan. The bottom-up approach is graphically shown in the form of an objectives tree that itself was produced in a workshop, while the top-down approach presents sector-wise development plans as shown on the left-hand side of the figure. Sector-wise development plans themselves have, of course, referred to the outcomes from the workshops but more were drawn from an expert viewpoint taking into consideration environmental carrying capacity, balanced development with others, and so on. The projects or programmes that were agreed from the viewpoints of both approaches will form part of an urgent short-term development plan.

5.1.2 Sharing Knowledge and Natural Resource Management

“Sharing Knowledge with the Communities” and “Natural Resource Management” are key

issues in preparing the Master Plan. The Study Team, the communities and the Government officers worked together in RRA, PRA and PCM workshops. In the course of this process, the communities' knowledge was referred to in preparing the sector-wise developments. Natural resource management is a critical issue in this ASAL area since the environmental carrying capacity is just in balance, or the Study Area may even already have been showing signs of over-exploitation. Therefore, any development in this Master Plan should not include further resource exploitation but be based on resource management. "Sharing Knowledge with the Communities" inter-connects both bottom-up and top-down approaches, and "Natural Resource Management" constitutes an outer frame, within which the development plans / programmes are to be formulated. In Figure 5.1.1, "Sharing Knowledge with the Communities" is indicated at the point of contact between the bottom-up and the top-down approaches and "Natural Resource Management" acts as a framework within which to regulate overall formulation of the plan.

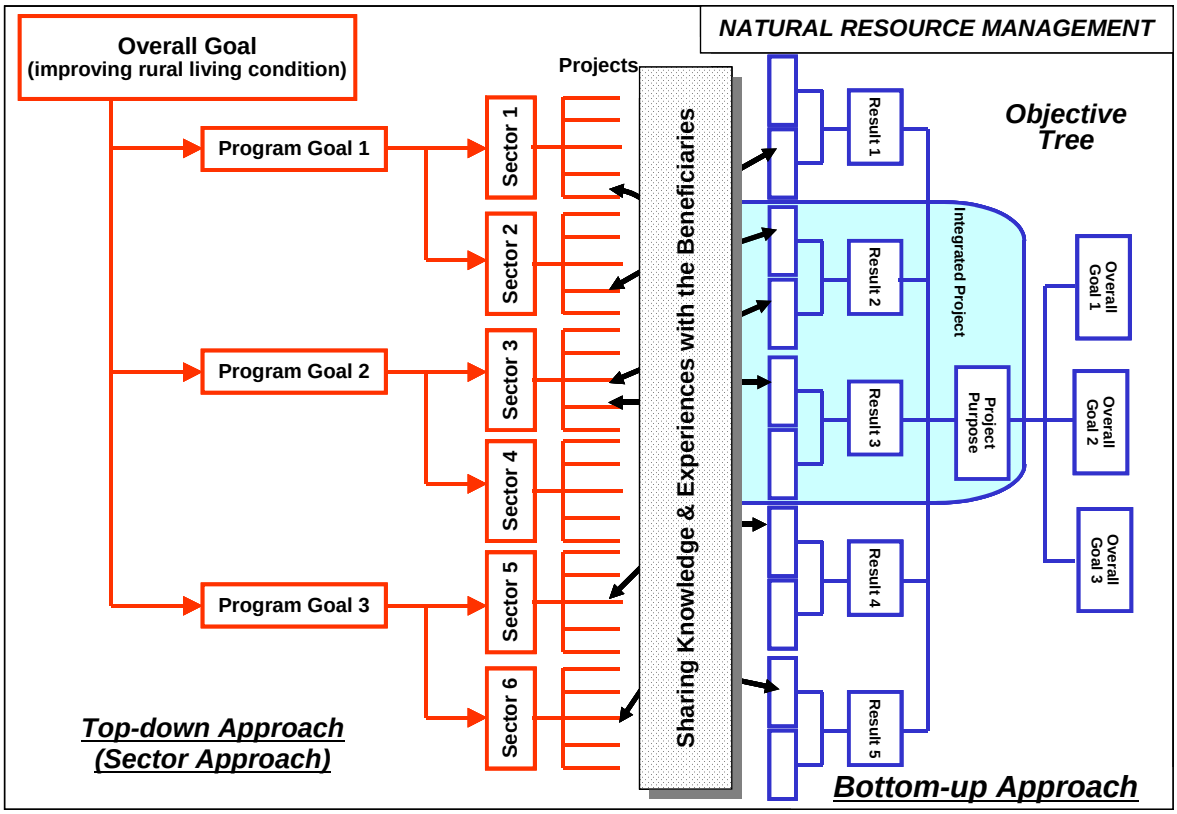


Figure 5.1.1 Conceptual Illustration of Formulating Master Plan

5.1.3 Integration of Sectors

Figure 5.1.2 shows the position of each sector in the Master Plan. There are three major factors in the Master Plan. The first factor is "income generating activities" (agriculture, small-scale industry and livestock) to achieve people's higher standards of living, security of food, and thereby the quality of life. The second one is "capacity development" of the local people (capacity building of rural community and human resource development) which enables sustainable development of the community. Lastly, "public services" (rural

health and sanitation, agricultural and rural infrastructure, and education and training) provided by administration system, which are the foundations of rural development. People are definitely at the centre of the development process and "environment and resource management" is the key requirement for the Master Plan as mentioned above.

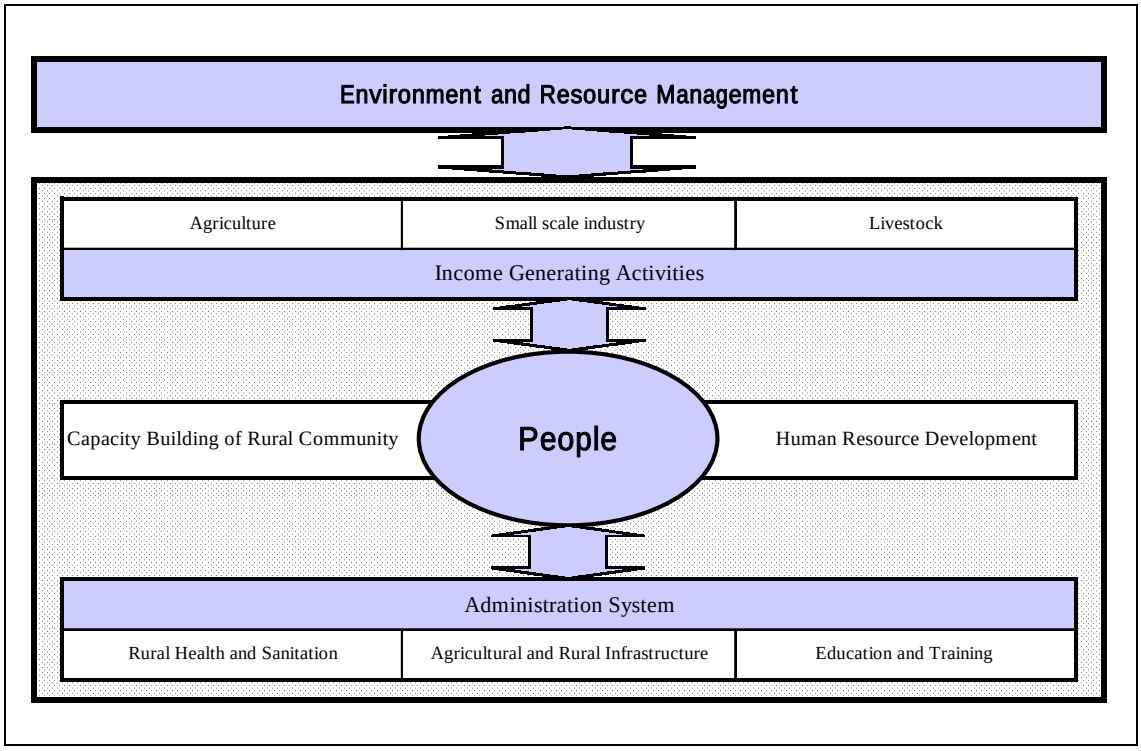


Figure 5.1.2 Positioning of Each Sector in the Master Plan

5.1.4 Time Framework

"Time Framework" should also be defined, composed as it is of short, medium and long terms, when preparing any development master plan. An urgent project is usually placed within short-term development with a high priority as long as no noticeable negative impact takes place. In this sense, the bottom-up projects identified during the workshops could mostly serve short-term development. This Master Plan adopted the following time frame consisting of short, medium and long terms as below, and the terms, especially beyond the short term, should be reviewed by feeding-back the results of preceding projects.

Short Term: 1st to 5th Year

Medium Term: 6th to 10th Year

Long Term: 11th to 20th Year

5.1.5 Provisional Integrated Development Plan and Selection of Verification Projects

By conventional survey, discussion and workshops with GOK officials, as well as bottom-up approaches such as PRA workshops and RRA, a development framework, which is shown in Figure 5.1.3, was prepared by the Study Team. To realize the overall goal of "Standard living of the farmers in ASAL area improves", four major programme purposes were identified: a) Villagers get more income (income generation activities), b) Villagers get adequate public services (basic human needs), c) Variable environment and resources are conserved (environment) and d) Administration organizations are strengthened (administration system).

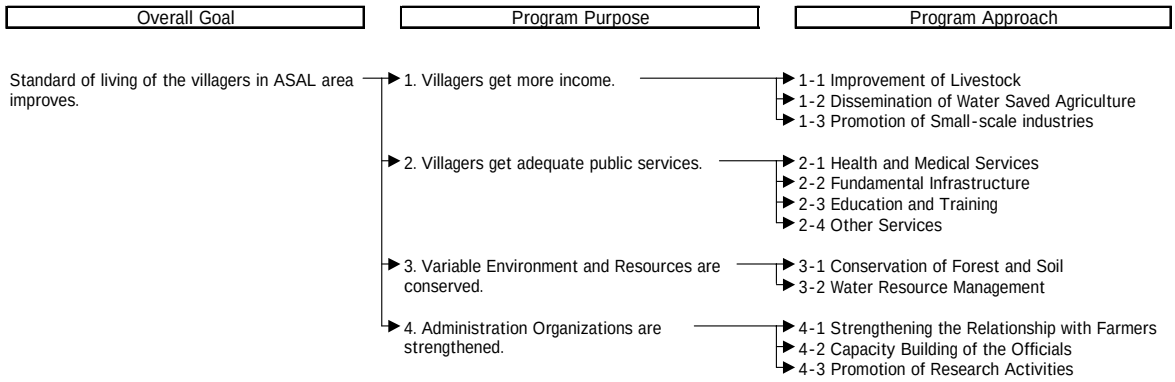


Figure 5.1.3 Development Framework in Baringo Semi-arid Land Area

The Study aims, first, to formulate a provisional development plan with a combination of top-down and bottom-up approaches and then to implement several small-scale projects called "Verification Projects" selected from the provisional short-term development plan. The Verification Project is intended to examine various hypotheses relating to development strategies/approaches, technologies and implementation arrangements. Through the actual implementation of several verification projects, valuable lessons are learnt and these hypotheses will be evaluated and refined into more accurate aspects and definitions, which are considered to be more practical, more effective and more sustainable in the development of the Baringo Semi-Arid Land Area. From this, valuable lessons may be learnt. The Final Master Plan will be formulated by feeding back the outputs of the verification projects into a provisional master plan. Figure 5.1.4 shows the Master Plan formulation in the form of a flowchart.

Figure 5.1.5 shows the outline of the Provisional Master Plan. Clusters of the Study Area are placed along the horizontal line and the vertical line indicates the time frame, short, medium and long term. Development projects and programmes are arranged according to clusters and the time frame. For example, livestock improvement and rehabilitation of

pan proposed by the PCM workshops are placed in the short-term development plan covering the first five years and improved jiko, though it was not raised during the workshops, is a programme proposed on the initiative of the Study Team taking into consideration the present environmental situation.

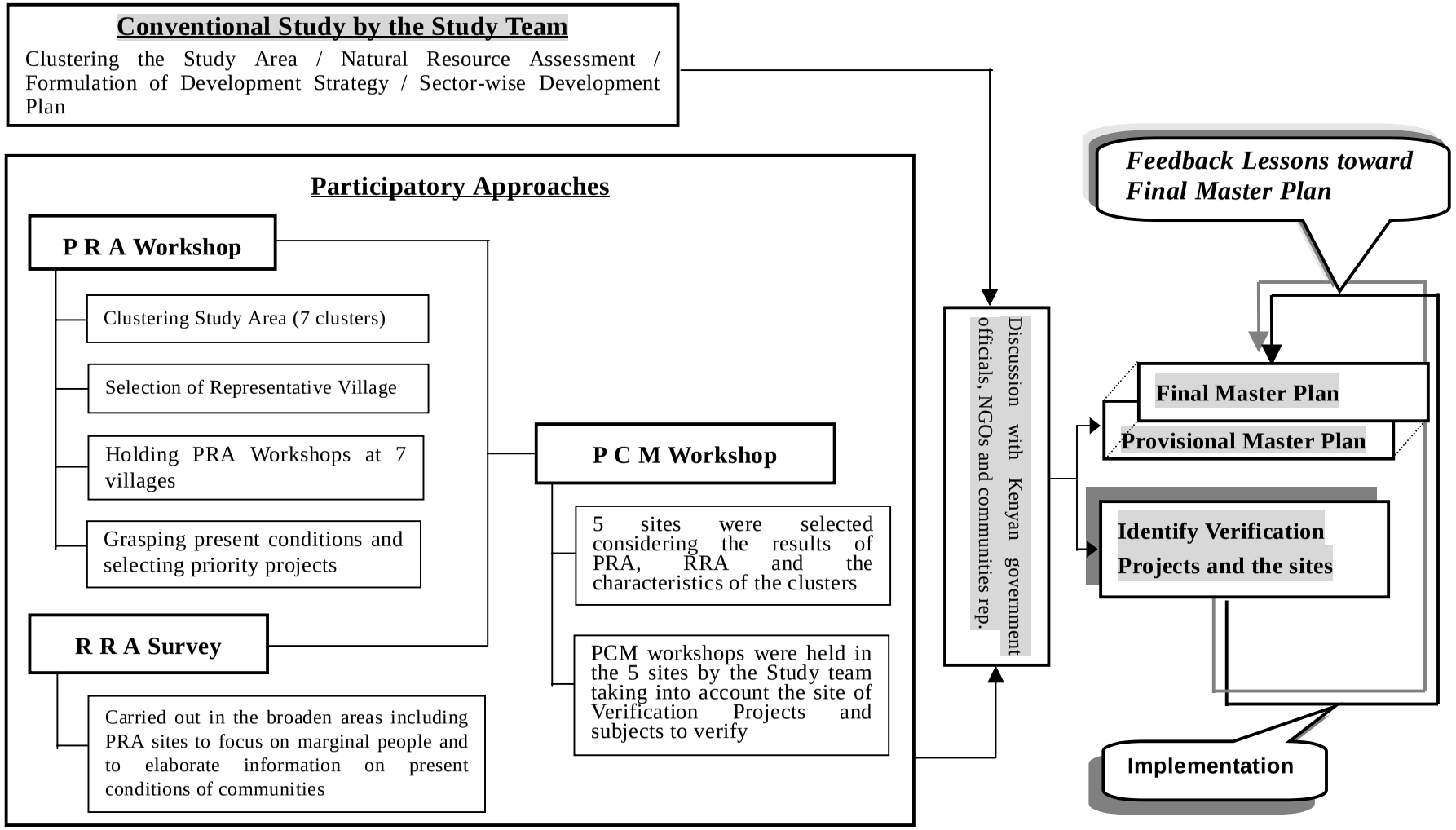


Figure 5.1.4 Formulation of Master Plan

Cluster	E	A	C	B	D	F	G
Location	Kimalel	Marigat	Salabani	Ilchamus / Ngambo	Sandai/Loboi/Kapkuikui	Kiserian / Mukutani	Arabal
Characteristics	Cosmopolitan, Commercial			Swamp, Crop field		Traditional, Pastoral	Livestock, Newly settled
Topography							

Sustainable Livelihood

Term	E	A	C	B	D	F	G
Short-term	SS1 Bottled honey SS5 Skin and hides marketing EV5 Rehabilitation of land IF4 Water supply	AG04,LV2 KARI-FRC LV3 Veterinary Office LV4 Bullock camps SS5 Skin and hides marketing HE1 Strengthen MBC HE1,SS2 Youth Polytechnic EV1 Improved Jiko EV6 Tree planting IF6 Electricity service	SS1 Bottled honey SS4 Handicraft SS6 Cultural center EV1, SS2 Improved Jiko EV5 Rehabilitation of land IF4 Water supply IF6 Electricity service	AG03 Pasture development SS4 Handicraft EV5 Rehabilitation of land IF7 Telephone service	AG01 Irrigated agriculture AG05 Land registration LV5 Livestock feeding SS1 Bottled honey SS4 Handicraft SS5 Skin and hides marketing IF7 Telephone service	AG02 Rain water harvesting HE2 Pre-primary schools IF4,EV2,IF7 Facilities	AG02 Rain water harvesting LV1 Animal disease control SS1 Bottled honey HE2 Pre-primary schools EV5 Rehabilitation of land IF5 Road improvement
Medium-term	AG02 Rain water harvesting AG03 Pasture development AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension SS3 Bee-wax candle EV1 Improved Jiko EV5 Rehabilitation of land	AG03 Pasture development AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension IF2 Water Authority IF3 Water management IF4 Water supply	AG03 Pasture development AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension SS7 Ostrich farm EV1 Improved Jiko EV6 Tree planting IF4 Water supply	AG01 Irrigated agriculture AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension EV1 Improved Jiko EV3 Farm catchment IF2 Water Authority IF3 Water management	AG01 Irrigated agriculture AG03 Pasture development AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension SS3 Bee-wax candle EV1 Improved Jiko EV3 Farm catchment IF2 Water Authority IF3 Water management IF6 Electricity service	AG01 Irrigated agriculture AG02 Rain water harvesting LV6 Animal health programs LV7 Bullock extension IF5 Road improvement	AG06 Social forestry AG07 Rangeland rehabilitation LV6 Animal health programs LV7 Bullock extension SS3 Bee-wax candle EV3 Farm catchment EV4 Individual pasture plot
Long-term	LV8 Livestock marketing EV3 Farm catchment IF1 Catchment water	LV8 Slaughter-house EV3 Farm catchment IF1 Catchment water IF4 Water supply	LV8 Livestock marketing EV3 Farm catchment IF4 Water supply IF5 Road improvement IF6 Electricity service	LV8 Livestock marketing EV4 Individual pasture plot IF1 Catchment water IF5 Road improvement	LV8 Livestock marketing IF1 Catchment water	AG01 Irrigated agriculture AG02 Rain water harvesting AG03 Pasture development AG06 Social forestry AG07 Rangeland rehabilitation LV8 Livestock marketing EV1 Improved Jiko EV5 Individual pasture plot IF6 Electricity service IF7 Telephone service	LV8 Livestock marketing EV1 Improved Jiko IF5 Road improvement

Figure 5.1.5 Provisional Master Plan

5.2 Evaluation of Verification Projects

5.2.1 Selection of Verification Projects

Figure 5.2.1 shows the selection process of the verification projects. The upper half of the figure shows the projects proposed by the bottom-up / participatory approach such as through RRA, PRA and PCM, and placed in the lower half are the development plans for the short term (first five years) of the Provisional Master Plan. As suggested in the figure, the verification projects were selected by coordination of the Provisional Master Plan and the priority projects proposed as a result of RRA, PRA and PCM workshops. Following are the selected verification projects and these are shown in detail in Figure 5.2.2.

1) Improved cooking stove and small-scale industries in Kampi ya Samaki and Salabani.
2) Communal resources management (participatory irrigation management and livestock improvement) in Sandai.
3) Food security (livestock improvement and rain-fed agriculture) in Arabal.
4) Rehabilitation of pan in Rugus.
5) Surveillance, information and support system improvement of epidemic and endemic diseases at Marigat Health Centre, in Marigat.
6) Strengthening Marigat Youth Polytechnic in Marigat.
7) Learning from best practice for all the verification projects above.
8) Rural Water Supply in Upper Mukutani (added in June 2001).

5.2.2 Designing, Implementing, Monitoring and Evaluation of Verification Projects

The verification projects were designed and implemented through a series of workshops with the leaders and beneficiaries of the communities. In community-based projects, it is difficult to design projects in blueprint form beforehand. Also a good deal of flexibility is necessary throughout the implementation process. Therefore designing, implementing, monitoring and evaluation cannot be divided clearly into differentiated stages of a project cycle. Nevertheless, workshops can be categorised into four stages of the verification period.

1st stage (August 1999 to October 1999)

Identification of verification projects using RRA tools, stakeholder analysis, problem and objectives analysis, and prioritising strategies / approaches

2nd stage (March 2000 to May 2000)

Detailed project designing (formulation of Project Designing Matrices and plan of action)

3rd stage (June 2000 to February 2001)

Monitoring and mid-term evaluation

4th stage (September 2001)

Final evaluation at end of verification period

During project implementation, some components such as improved jiko and rain-fed agriculture were extended outside the original verification project sites. Study tours to successful projects called "Learning from Best Practice" and a series of participatory monitoring activities covering all the communities in the Study Area, called "Inter-location Monitoring" contributed to the extension of the verification projects and also some extent to the capacity-building of the people.

5.2.3 Evaluation of Verification Projects

In this section the evaluation of the verification projects is carried out. Firstly change of the schedule is summarised to gain an overview of the picture of the whole implementation process. Secondly an evaluation of the outputs and also the results of verification are carried out and finally there is evaluation of the verification projects as an area-wide integrated programme. Through the evaluations, the lessons learned from the verification projects are summarised as being the way forward to incorporate them into the Master Plan and also some common issues are abstracted. These common issues are realised as planning and implementation disciplines in this Study.

1) Schedule

The period of verification project implementation was from March 2000 to September 2001. The commencement of the implementation was delayed by one month due to security issues around the Study Area and the schedule assumed by the Study Team was changed to a greater or lesser degree according to the circumstances of each verification project. The community beneficiaries of the projects were supposed to take the initiative about the exact nature or definition of community-based projects. Therefore the significance of the schedule as originally assumed is nothing more than the mean point of entry for the outsiders to participate in community development. A major change in the schedule is described below with details given in Figure 5.2.3.

Small-scale Industry + Improved Jiko (Kampi ya Samaki)

- Construction of multi-purpose building was much delayed due to non-fulfilment of the contract by the contractor. The Study Team and women's group had to invest additional funds in order to complete the construction.
- A long struggle to raise funds to cover the building cost postponed the opening of the shop though three rooms of the building had been completed ready for business since August 2001.

- Extension of the improved jiko started earlier than expected. Learning from Best Practices (Study Tour to Kitui) and Inter-location Monitoring contributed to this rapid extension.

Communal Resource Management: Participatory Irrigation Management (Sandai)

- Canal lining started earlier than planned because of anxiety about the beginning of the rainy season. However, shortened facilitation procedures prior to the construction created a breakdown in communication between the community and the Study Team.
- After the completion of the canal lining, diversion boxes were installed one by one according to the cash contribution by the community. Though this arrangement held up progress, it was felt necessary considering the delinquency of the community's cash contribution for the canal lining.

Livestock Improvement: (Sandai and Arabal)

- Some tools for animal health and feeding promotion such as tsetse fly nets, and sickles were not provided to farmers due to delays in fund raising for the farmers' cost-sharing.

Food Security: Stabilisation of Rain-fed Agriculture (Arabal: Partalo)

- The rainwater harvesting technique was extended from the original site to the other areas through inter-location monitoring and active counterparts. It was not even expected that the extension would start during the verification period.

Rehabilitation of Pan (Rugus)

- Rehabilitation work was much delayed due to the fact that severe drought forced men to go far looking for food, soil was much harder to dig than expected, and a Pokot invasion suspended the implementation.

2) Evaluation of Verification Projects

Evaluation of the verification projects were carried out with the three points of 1) a conventional evaluation of efficiency, effectiveness, validity and sustainability and impact, 2) confirmation of the questions “How” and “limits” in speaking of the verification projects from planning stage to implementation stage and 3) a general evaluation as verification of the Area-wide Integrated Approach. Evaluation 3) is intended to evaluate all the verification projects as a mini version of the provisional master plan.

- Conventional evaluation of outputs and impacts of the verification projects,
- Confirmation of “How” and “limits” through the process of from planning to implementation of the verification projects
- General evaluation as verification of the Area-wide Integrated Approach

Evaluation of each verification project is summarised in Tables 5.2.3 to 5.2.12. The

evaluation table consists of the items below. Items from 3 to 6 are related mainly to the conventional evaluation. Items 7, "Capacity building" and 8, "Impact and outcome" are actually the most important results of the projects especially in the context of social development, though these items are not clearly mentioned as the project purpose. Item 2 is "Subject to verify" and its result is summarised in item 9. Item 10, "Way Forward", focuses on "How" and "Limits" of the project implementation obtained through the verification process.

Evaluation Items

1. Background
2. Subject to Verify
3. Input
4. Implementation Process
5. Output (originally expected / programmed)
6. Evaluation (rated on a scale from 1 to 5)
7. Capacity Building
8. Impact and Outcome (other than originally expected / programmed)
9. Verification Result
10. Way Forward

2.1) Conventional Evaluation

The output of each verification project was measured with the objectively verified indicators and the project was evaluated as cross-project evaluation in terms of efficiency, effectiveness, relevance, sustainability and impact. These five aspects can be explained with reference to the project summary that is given by summarising the Project Design Matrix (PDM) prepared for each verification project. The table below summarises the evaluation, and notes are given further down:

Table 5.2.1 Relationship between Five Aspects of Evaluation and Project Design Matrix

Project Summary	Five Aspects				
	Efficiency	Effectiveness	Validity	Sustainability	Impact
Goal					
Project Purpose					
Output					
Input					

Efficiency: Did "Input" turn to "Output" efficiently, and how much?
Effectiveness: Did "Output" fulfill "Project Purpose", and how much

(expectation/possibility to be considered)? And also, did "Activities" produce "Output", and how much?

Relevance: Are "Output", "Project purpose" and "Goal" still valid? Are established "Goal" and "Project purpose" in accord with GOK/donor policy? Is the relation between "Output", "Project Purpose" and "Goal" still valid?

Sustainability: For sustainable development, are the required elements already in place or in process of being put in place in terms of the institutional, financial and technical aspects?

Impact: What kind of positive or negative impact was observed? And are these impacts direct or indirect? Direct impact is checked on the "Project Purpose" line while indirect impact is confirmed on the line "Goal".

The evaluation is made on a scale 1 to 5 with 5 being the highest except for impact (impact is given in the aforementioned tables 5.2.3 to 5.2.12). Mark 3 is the grade at which the planned target can be said to have been achieved. As for sustainability, 3 is where the project is considered just to maintain the *status quo*, 4 is for the project to be sustainable with less input from outside and 5 is to be thought sustainable with almost no input from outside.

The table below summarises the evaluation of each verification project component. The projects which can be sustainable are improved jiko, rainwater harvesting and the buck scheme. These projects can be recommended for wide dissemination over the whole ASAL, or it is suggested that these projects be identified as entry programmes for the development of the ASAL areas. On the other hand, dip improvement and rehabilitation of pan and PIM are evaluated as less sustainable.

Table 5.2.2 Summary of Verification Projects

Project	Efficiency	Effectiveness	Relevance	Sustainability	Impact
Improved Jiko	5	5	5	4	
Rainwater Harvesting	4	5	5	5	
Buck Scheme	A4, S2	A4, S3	A4, S2	A4, S2	A: Arabal S: Sandai
Dip Improvement	A2, S2	A2, S2	A2, S2	A2, S2	A: Arabal S: Sandai
Rehabilitation of Pan	3	2	4	2	
PIM	4	4	4	2	
Water-saved Agriculture	2	4	3	3	
Small-scale Industry	2	N.A.	N.A.	N.A.	Construction delayed
Rural Water Supply	3	3	4	3	
MYP	3	4	4	3	
MHC	4	4	4	3	

As for dipping, in the ASAL areas, where people take cattle far away from their base during the dry season, the number of cattle to dip decreases to a level so low as to make it difficult to purchase accariside. Hence in such places, dipping operations cannot be financially viable. As for the rehabilitation of pan for similar reasons, periodic assistance from outside will be necessary to maintain the function of pan. People diversify their activity to survive and men are going to take cattle far away especially during the dry season when it is the appropriate time for desilting the pan.

As for Sandai, the project was successful in terms of efficiency and effectiveness. However, a strong dependency syndrome was observed in the people from this area with people seeming to expect cost-sharing even for maintenance of facilities like dredging canals which is supposed to be done daily at their expense. To improve the sustainability in such areas, a fundamental policy change in the part of donors will be needed.

2.2) Confirmation of "How" and "limits" through the process from planning to implementation of the verification projects

Since these are verification projects, evaluation of the process, analysing "why" it happened and "how" it happened, is also very important for the Study. "Why" and "how" learned from the implementation of the verification projects will be the keys to make the tentative master plan more realistic and applicable. With this aspect, the subject to be verified in each verification project was defined and the results confirming the "how" and "limits" of each verification project for applicability and further extension are summarised under the headings of "Verification Result" and "Way Forward". Major ideas from this evaluation in each verification project are summarised below and details are given in Tables 5.2.3 to 5.2.12.

<u>Improved Jiko (Kampi ya Samaki → Whole Study Area)</u>

The principal method to be adopted in expanding an improved jJiko has shifted from "with GOK/JICA" to "by themselves". Though this shows, to a certain extent, the self-sustainability of the programme, the fact that the dissemination after November, 2000 has very considerably slowed down implies a need for continued minimal support by GOK/Donors to further extend the programme.

<u>Rainwater Harvesting (Arabal(Partalo) → Chemelongion and Kapkune)</u>

The size of the water harvesting system should not be too great. Because the aim of rainwater harvesting is to collect irregular and intensive rainfall, there will be more disparity between the upper part and lower part of the farm in allocating rainwater collected from the catchment area, as the system becomes bigger. There will be cases where the farm is flooded in its upper part at the same time as the lower part suffers a water shortage. Therefore the scale of about four ha tried in the verification project can be applied as pilot, but for further extension, the scale should be smaller-scale (e.g. four to five ha with five to six farmers), or individual based extension is preferable if the

topography allows.

Livestock Improvement: Buck Scheme (Arabal and Sandai)

Because the price of a buck is equivalent to two to three head of the local breed, fair enough to buy the buck individually, the programme may tend by its nature to be individually- based. Therefore, a group-based scheme may be preferable as a pilot, and also in the case of poor people who cannot afford to buy a buck individually. However, even if an individual basis prevailed, technical advice in selecting bucks and in their transportation of the bucks should be forthcoming through the programme.

Livestock Improvement: Dip improvement (Arabal and Sandai)

It would appear that a dipping system based at a particular location in an area where livestock ranges widely in search of fodder is very difficult to sustain. In the cases of Sandai and Arabal, if about 10% of the livestock in the area came to the dip every month, the system would indeed be financially sustainable. However people allow their animals to range over a broader area during the dry season, causing a decrease in the number of livestock to be dipped, and this hampers the dip committee in buying accaricide. Rather than a fixed dipping system, a hand sprayer system, which moves around with the livestock, may well be worth adopting in this situation.

Participatory Irrigation Management and Water-Saved Agriculture (Sandai)

The fact that the area had received assistance from many donors caused a dependency syndrome to develop. To encourage community initiative and motivation, it is proposed that the donor should request the community to commit for a certain part of the project cost prior to the commencement of the project or the donor will apply step by step contributions to the cost.

Rehabilitation of Pan (Rugus)

Diversifying activities to aid survival is what dominates people's interest. Moreover men are going to take cattle away long distances, especially during the dry season, which is an appropriate time for desilting the pan. It is, therefore, difficult to sustain the regular maintenance of the pan by community themselves under semi-arid conditions, though this should not be over generalised. Therefore periodical intervention such as food for work will be needed for the sustainable maintenance of the pan.

Small-scale Industry (Kampi ya Samaki)

For the development of income-generating activities in ASAL areas, diversification is necessary to stabilise a certain level of income, considering the unreliability of resources over the years. For example, in a year of severe drought bee-keeping, which relies on acacia trees, will suffer a poor harvest but people can still rely on the fish in Lake Baringo. Also continuous rather than intensive, but *ad hoc* support/training is required from the GOK side, especially in the skills of business planning, record-keeping and accounting.

Rural Water Supply (Upper Mukutani)

In a rural area, people do not have cash in hand all the time, but save their property as a form of livestock. The flow and amount of cash in the rural area is limited. Therefore the operations and maintenance cost borne by the community should not be charged with a small amount whenever they fetch water from the taps, but once or twice per year at an amount such as the price of a goat.

Marigat Youth Polytechnic (MYP)

Like many other polytechnics in the region, it is difficult to achieve sustainability of the polytechnic through training fees only. Some form of sponsorship, fund-raising, subsidisation and income-generation activities are necessary to achieve this financial sustainability. For example, as a part of this income-generating activity, marketing products such as chairs and desks from the carpentry courses will be needed to stabilise the financial status of MYP.

Marigat Health Centre

Collaboration with the Ministry of Environment and Natural Resources will be needed for both health promotion and water resource development. Also primary health care (PHC) combined with extension of improved jiko will contribute to women's health.

2.3） Verification of Area-wide Integrated Approach

The verification projects are basically an integrated set of projects that were considered urgent for the short term with minimum input in the provisional area-focused master plan. Thus the verification projects consist of a wide range of projects (see below) which are aimed at income generation, fulfilling basic human needs, providing fundamental public and community services, and conservation of the environment. With these aims, it is expected to be possible to achieve the goal set - that is, to improve the living standard of the residents of the Study Area. As they cover almost all the sectors, the verification projects are considered as a mini version of the provisional master plan for integrated rural development.

1） Rural community development / gender
Strengthening community organisations in each verification project

2） Administration system
Learning from best practice, training in PRA, RRA and PCM

3）Human resource development
Support to Marigat Youth Polytechnic

4） Agriculture
Water-saved irrigated agriculture, rainwater harvesting, participatory irrigation management

5） Livestock
Animal disease control, introduction of improved bucks

6) Small-scale industry
Bottled honey / beeswax candles, handicraft improvement, sales of fried fish

7) Environment
Promotion of improved stove (Jiko), conservation of pan's catchment area

8) Rural health and sanitation development,
Marigat Health Centre

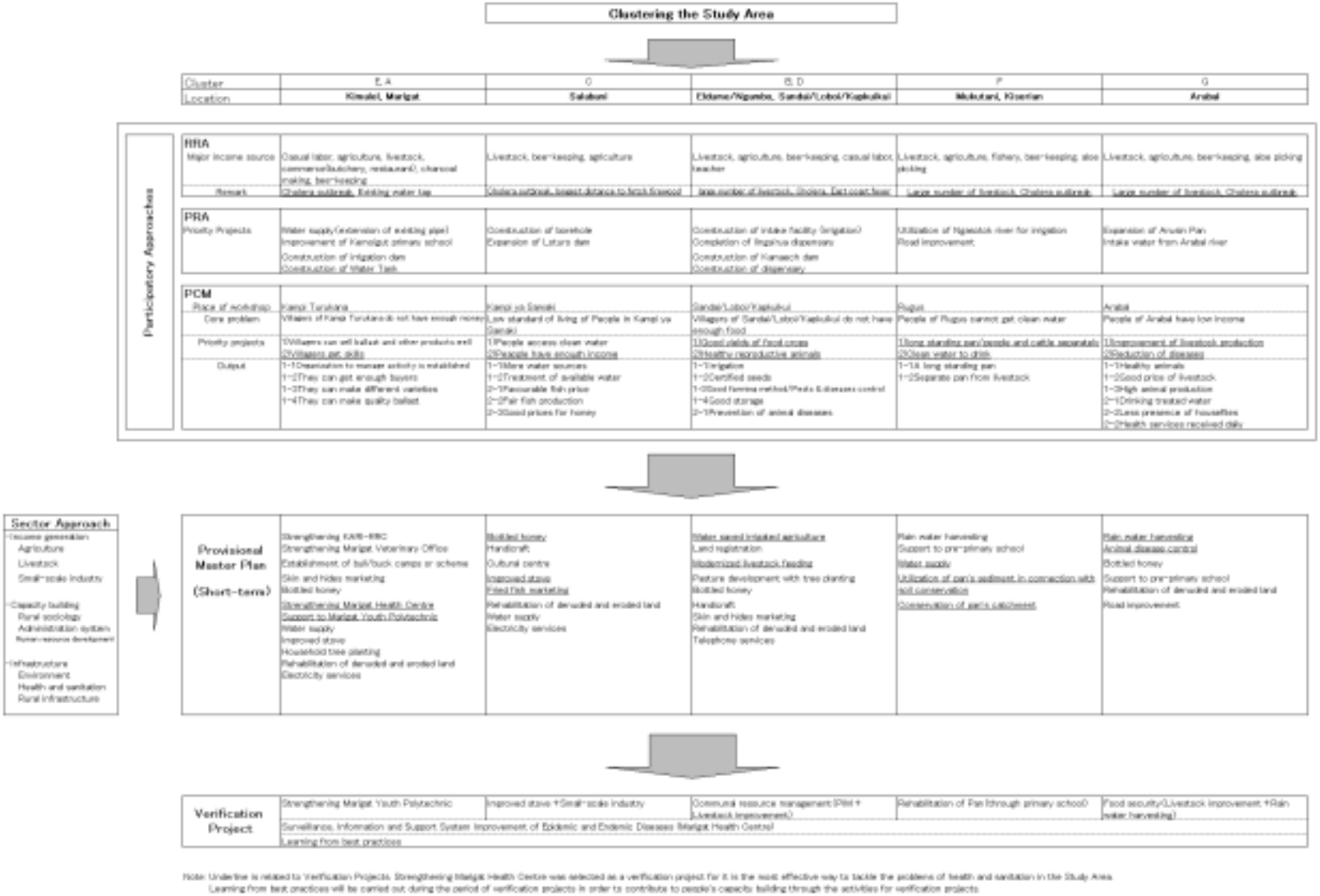
9) Agricultural and rural infrastructure development,
water supply

It is too early to verify the area-wide integrated approach, which is in a sense a mini version of the provisional master plan itself, but no fundamental problems have been found so far.

Learning from best practice and inter-location monitoring has been proved to be highly effective for dissemination of new ideas and technology especially where many projects with different approaches are introduced area-wide. People who were not originally participans in particular verification projects learned about and introduced improved Jiko and improved rainwater harvesting by themselves. Not only the community members who are the direct beneficiaries of the verification projects, but the residents of the whole Study Area could participate in this area-wide integrated approach. That means that the focus is no longer on the projects, but on the area itself.

Another aspect is the need to contribute to transparency, accountability and objectivity. People can easily see things objectively only if they can compare one with another. Since the components of improved bucks and dip management were introduced in two locations, Arabal and Sandai, the difference was clear to the participants of the verification projects, to the officers at division, district and national level, and to the Study team as well. In the divisional working committee, divisional officers from all the departments can discuss the verification projects periodically. People from different locations exchanged opinions with each other during inter-location monitoring and workshops about the common issues such as progress and management of the verification projects, leadership, cash contribution etc.

Lastly, the fundamental strength of area-wide integrated approach is in its diversity and low input. It is especially important in ASAL areas where diversity is the primary survival strategy. Concentration on one activity means death in an ASAL so that it is against the social norm to force the people to work on one thing. On the other hand, it is extremely difficult to select one project that is certainly to succeed in an ASAL from the planning side. An area-wide integrated approach can increase the probability of success as a programme, rather than that of each project component. Through the verification period, no negative effects militating against this approach were identified.



Note: Underline is related to Verification Projects. Strengthening Marigat Health Centre was selected as a verification project for it is the most effective way to tackle the problems of health and sanitation in the Study Area.
Learning from best practices will be carried out during the period of verification projects in order to contribute to people's capacity building through the activities for verification projects.

Figure 5.2.1 Process for Formulation of Verification Projects

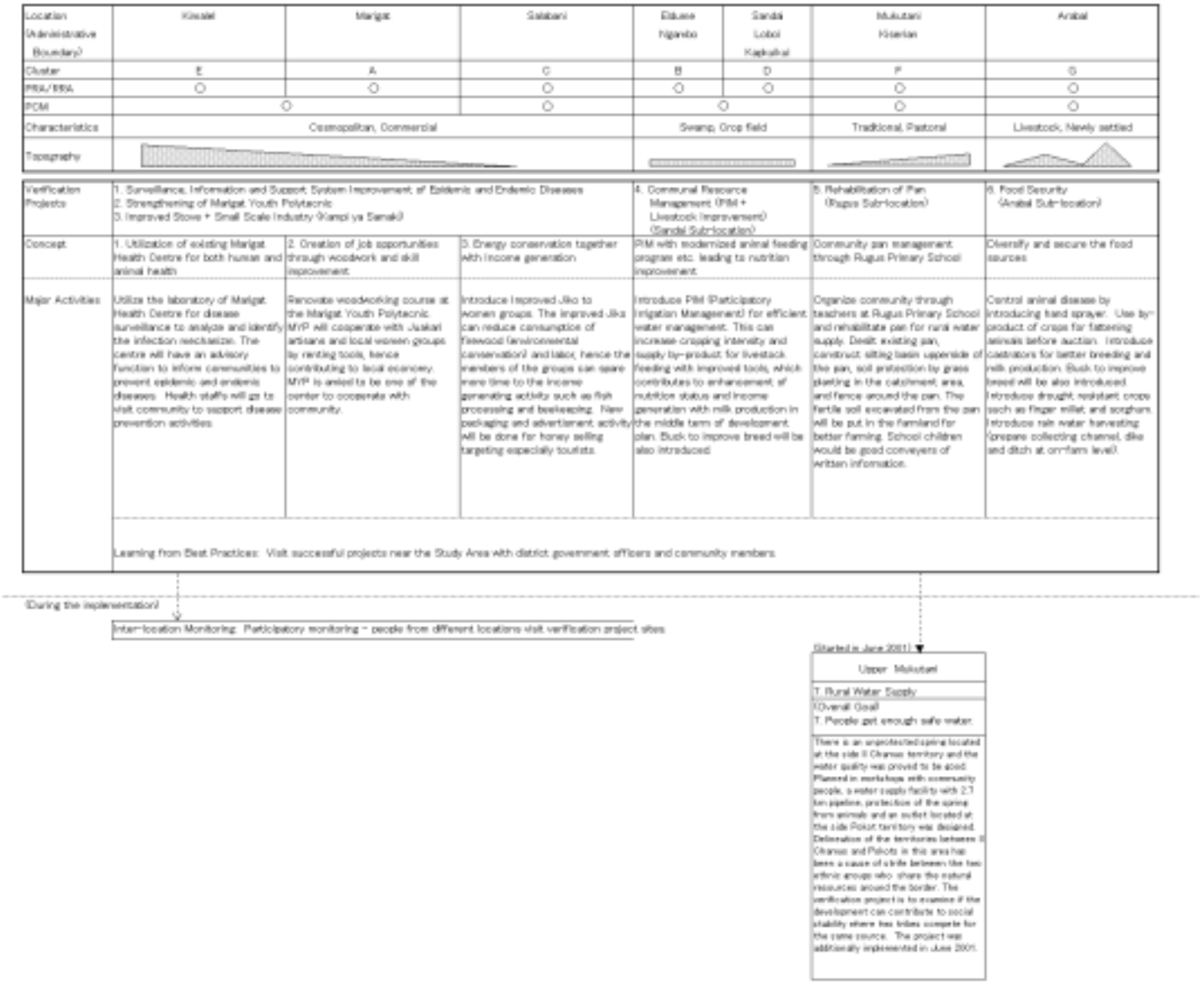


Figure 5.2.2 Outline of Verification Projects

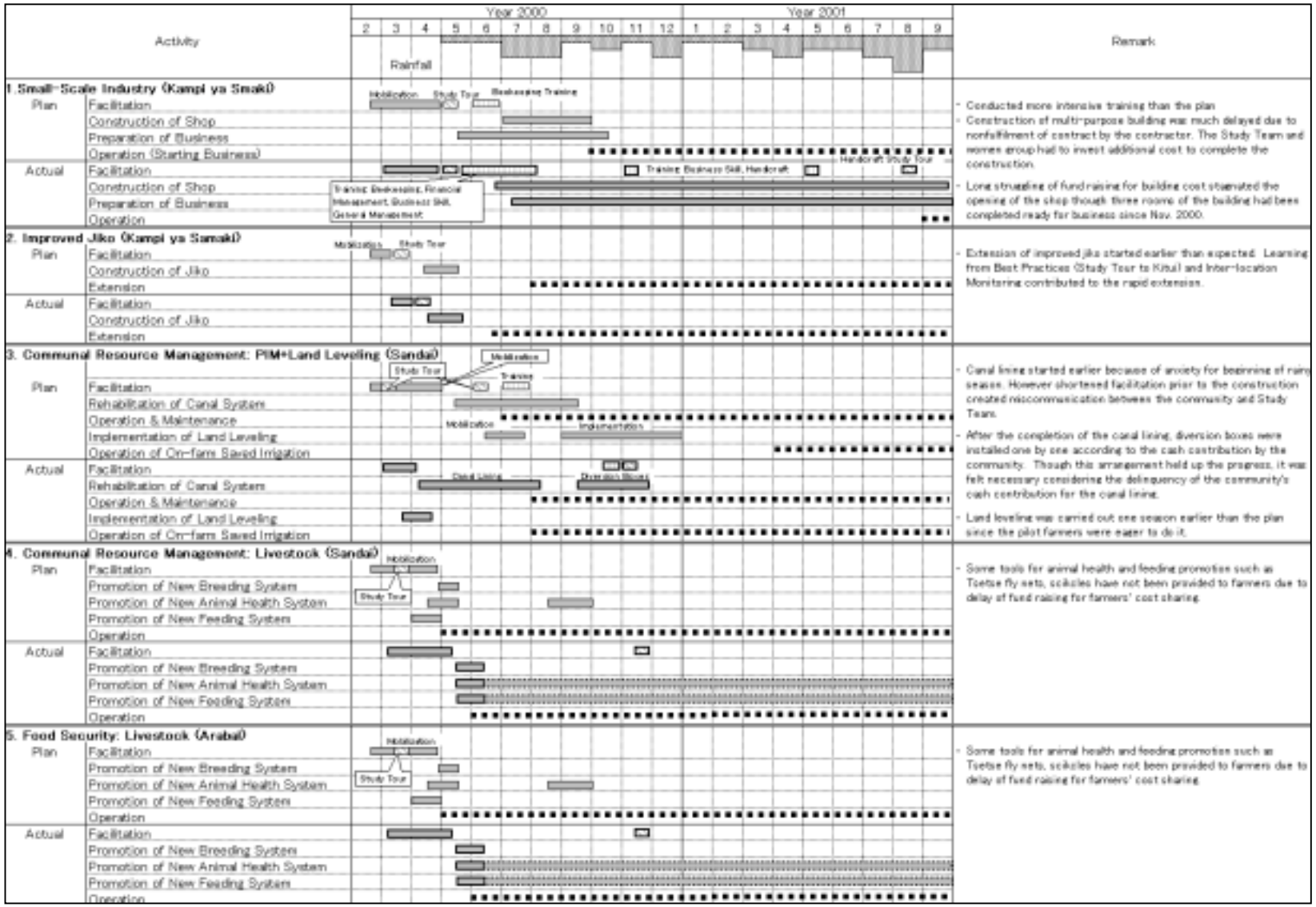


Figure 5.2.3 Schedule Change of Verification Projects (1/2)

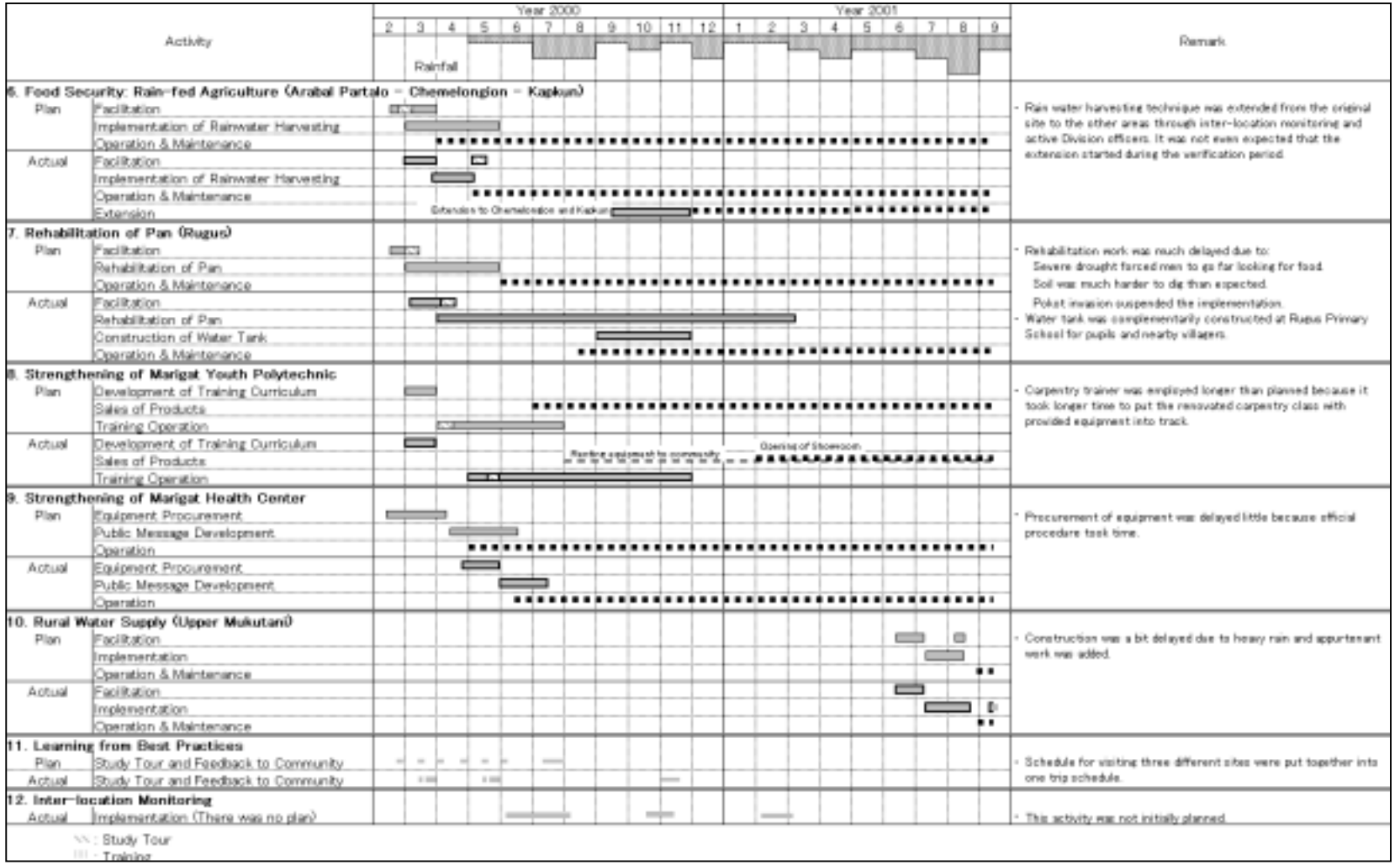


Figure 5.2.3 Schedule Change of Verification Projects (2/2)

Table 5.2.3 Improved Jiko (Kampi ya Samaki → Whole Study Area)

1. Background

Firewood available in the Study area is becoming scarce and scarce, and the time women need to fetch keeps on getting longer and longer. Environmental degradation is being worsened due to the increasing pressure of firewood associated with population growth, and this situation makes women difficult to do income generating activities as well. To conserve precious natural resources (trees) as well as to spare enough time to do income generating activities for women, an energy and cooking time saving Jiko is envisaged.

2. Subject to Verify

1. *To examine if the improved Jiko could well be adapted in ASAL area and then could save firewood, which in turn contributes to sustainable environmental conservation.*
2. *To examine if the improved Jiko could reduce time of fetching firewood and cooking, thereby creating more time that the users could spend for income generating activities.*

3. Input

1. *Anthill soil, stones, cow dung, and water that are all locally available materials.*
2. *Technical assistance of how to make the Jiko and its dissemination (one GOK home economics officer with transportation).*

4. Implementation Process

1. *Three local women were initially trained as the Jiko expert, and then merry-go-around scheme (alternate construction by the members of 3-5 with an assistance of the Jiko expert) was introduced to promote the improved Jiko.*
2. *Training local women invited community members' jealousy, thereby the expert became regarded as a member or an agent of JICA. Community members in Kyamp ya Samaki area ended up in total dependency on the Jiko expert to construct. This gave overburden on the expert, so that she finally stopped working as the expert.*
3. *Merry-go-around scheme did not well work in some areas either because some members did not collect even the local material of soil and stone available just around her house, rather waiting for the group members to assist.*
4. *Taking into account above situation, just grouped construction or individual based promotion was more focused in association with inter-location monitoring that is a very workable mean to motivate women to construct the Jiko.*
5. *Full sized Jiko (3'x4') could not be accommodated in small houses where most of poor people reside (full size Jiko required a kitchen house to be installed). Therefore, small sized Jiko (2 fireplaces) became focused in order to diffuse into poorer people.*

5. Output (originally expected/programmed)

1. *Jikos constructed in the Study area as of September 15, 2001 are: 26 in Kyampi ya Samaki (originally targeted area), and 61 in other areas as a result of extension through inter-location monitoring. Out of the total 87, 73 are still well functioning.*
2. *The Jiko can save firewood by 63% as compared to the conventional 3-stones Jiko (average of 83 samples), and can reduce the cooking time from 90 to 40 minutes for supper and 60 to 30 minutes for breakfast as an average. The saved time is mostly spared to take rest and in some cases invested in farm work and income generating activities.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*5*	*Input is very small that is locally available material only with a technical assistance, while the output is very high and diffusion can also be done with minimal support by GOK.*
2) Effectiveness	*5*	*The Jiko conserves 63% firewood and reduces cooking time to at least half.*
3) Relevance	*5*	*The Jiko greatly contributes environmental conservation, as well as release women's burden thereby women become able to spare the saved time to do productive works.*
4) Sustainability	*4*	*Though normal condition ensures the sustainability of the Jiko, water scarcity area would have difficulty to maintain the Jiko, thereby giving "4" to the sustainability (maintenance should be done once in every one or two weeks and it requires about 3-5 litter water).*

7. Capacity Building

Those below are, though indirectly, attributable to capacity building for the women who use the Jiko;

1. *Thanks to the saved time, the women have become able to talk more with their spouses and children, making their relations better as well as contributing to establishing her status in the household.*
2. *Children now can reach school in time because the mother can feed them earlier thanks to the fast cooking (some children had sometimes been late for school), releasing indebted feeling to the school.*

8. Impact and Outcome (others than originally expected/programmed)

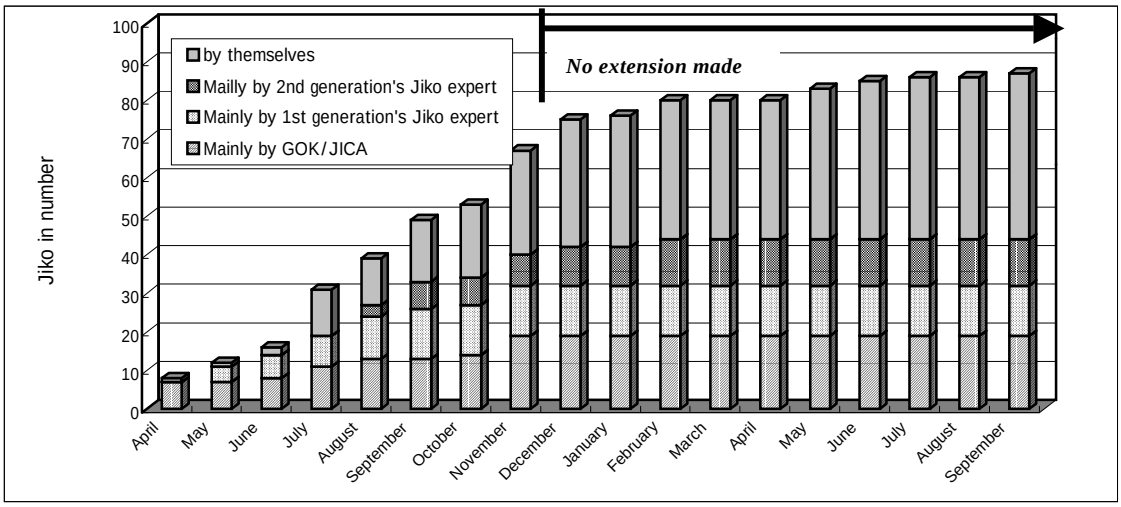
1. *Women who use 3-stones Jiko usually suffer from back pain, but now the back-pain has mostly disappeared after the introduction of the Jiko, especially for women with big body-size.*
2. *Clean water became mostly available because the water can be boiled at the same time of cooking meals, contributing to easy promotion of hygienic practices.*
3. *Chicken and goats are no longer messing the food that are cooked at higher place than 3-stones and placed on back-top of the Jiko.*
4. *No child turns over food because the food is placed on the Jiko. Security for children is now kept so that the mothers feel very happy and also elder children can help mother in cooking in much safer situation.*
5. *The Jiko gives good appetite because the charcoal, after cooking ugali at the center, can be put to the sides so that vegetable and tea/water remain hot.*

9. Verification Result

1. *The improved Jiko has been well adapted in the Study area, as a total of 87 Jikos has been constructed with a minimal assistance from GOK and JICA Team. The Jiko can save firewood by 63% as compared to the conventional 3-stones Jiko (average of 83 samples), thereby it was proved that it contributes to sustainable environmental conservation.*
2. *However, as the full sized Jiko requires kitchen house separate from living house, poor people who live in a hut-house wherein kitchen is together accommodated have difficulty to install the Jiko. Therefore, a small sized Jiko (2 fire places; see photo) which could be installed in a hut-house should be promoted for poor people.*
3. *The Jiko can reduce cooking time from 90 to 40 minutes for supper and 60 to 30 minutes for breakfast as an average. The saved time is, at present, mostly spent to take rest and talk to spouses and children. Some women, though still several numbers only, invested the saved time in their farm work and businesses.*

10. Way Forward

1. *Expansion of Jiko beyond the originally programmed area, which is Kampi ya Samaki, had started as early as June thanks to the inter-location monitoring tour. The major construction manner has shifted to "by themselves", which means Jiko is constructed without any presence of GOK/JICA or Jiko expert. Though this shows, to a certain extent, self-sustainability of the program, the fact that the dissemination after November, 2000 has very slowed down as shown below implies still a minimal support by GOK/Donors to further extend the program; namely, extension services as well as technical advices by a home economics officer with transportation.*



2. *To further diffuse the Jiko, flexibility rather than sticking on training Jiko expert or merry-go-around scheme, should always be pursued. Here, a guide is: 1) a demonstration be done as the first stage; 2) some time after the demonstration, GOK/donors shall visit the villages again to facilitate several ordinary women to form a group and then construct the Jiko by themselves; 3) in line with regular monitoring to avoid technical error, neighboring villages be also visited to further diffuse the Jiko, and 4) in parallel with those above, new version of Jiko, two fireplaces Jiko, should be tried in order to further expand to poorer households.*

Table 5.2.4 : Rainfed Agriculture（Partalo → Chemelongion and Kapkune)

1. Background

Severe drought occurs once every ten to fifteen years in the Study Area and emergency relief food has been chronic. Land has also been deteriorated without soil and water conservation, limiting the vegetations to secure food for human and livestock. In hilly Arabal location, people have been trying to crop with only rainwater and have got harvest once or twice in five years. It is considered that technique of rain water harvesting could stabilize the rain-fed agriculture, which in turn results in securing food, and soil and water conservation.

2. Subject to Verify

To examine if rainwater harvesting technique can stabilize the rain-fed agriculture and be easily disseminated into the different communities in the area.

3. Input

1. *Seeds and pesticides (drought resistance maize, millet, pigeon peas etc.): 43,180Ksh (Partalo: 9acre, Chemelongion: 10acre, Kapkun: 10acre) (100% borne by community)*
2. *Labor: 300 man-day in each site*

4. Implementation Process

1. *Training of farmers on construction of on-farm water harvesting structures was conducted in April 2000.*
2. *Introduction of crop husbandry technology with quality seeds and operation and maintenance of the water harvesting structures was carried out in April 2000.*
3. *Survey works were done by the Study Team in April 2000.*
4. *Study Tour to Machakos and Kitui with 18 Partalo villagers was conducted in May 2000.*
5. *A large run-off discharge destroyed diversion and lateral channels as well as some Fanya Juu embankment (Partalo). Installment of brush dams in run-off streams and other soil conservation works were made.*
6. *Severe prolonged drought disturbed construction of the structure and land preparation works.*
7. *Pests of wild animals and diseases damaged the crops.*
8. *The verification project was expanded to other two sites of Chemerongion and Kapukun according to community request. People knew about the project in Partalo through inter-location monitoring and information of divisional officers.*

Rainwater flowing into farm

5. Output (originally expected/programmed)

1. *Crop yield with rainwater harvesting technique increased by 2.4times as compared to the maize yield without the project as an average in Chemerongion, with applying quality seeds and diversified crops like pigeon pea, green gram and cowpea.*
2. *Food security is improved because the stabilized rain-fed agriculture increased crop production.*
3. *The rainwater harvesting structure promote soil and water conservation by nature especially in case of construction of Fanya Juu terraces.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*4*	*Crop yield improved with small inputs from outside. The entire earthwork for rainwater harvesting were done by community themselves with the technical advice of GOK officers.*
2) Effectiveness	*5*	*Crop yield increased by 2.4times as compared to the maize yield without rainwater harvesting as an average in Chemerongion. Also cropping was diversified as growing pigeon pea, green gram and cowpea. The rainwater harvesting technique is proved to be very effective.*
3) Relevance	*5*	*The rainwater harvesting is needed in the area where irrigation is not available. Utilizing rainwater is the only way of improving farming especially in the hilly side to secure and diversify the opportunity of getting food in ASAL.*
4) Sustainability	*5*	*The rainwater harvesting technique has been extended in almost whole Partalo community and other communities of Chemerongion and Kapukun. This program is very promising and manageable by community.*

7. Capacity Building

1. *At the beginning, Partalo community could not understand the labor supply without payment. The Study Team repeatedly explained about the cost sharing system until the community understood. It was the process of bringing about sense of ownership for Partalo community.*
2. *After the people of two villages showed their interest in the rainwater harvesting, a series of study tour among the concerned people was carried out to exchange the knowledge and experiences. Through this activity, people in Partalo proudly explained their experiences and knowledge, which was a process of capacity building of Partalo people.*

8. Impact and Outcome(others than originally expected/programmed)

1. *Concerning negative impact, owner of the women group's plot in Partalo asked the group to return the land by next year. Therefore the women group has to acquire other land. Benfefit of the project raised the issue of communal land, which is not registered as private property.*
2. *Through inter-location monitoring, villagers in Chemelongion in Arabal and Kapkun in Kimalel were interested in the rainwater harvesting technique and requested GOK officers to introduce the same technique in their areas. With the technical assistance from the GOK officers, the villagers in the above two villages applied the technique and got good harvest.*

9. Verification Result

Not only the farmer beneficiaries of the verification project site in Partalo, but also almost all farmers around the project site have participated in construction of the structures and learned the rainwater harvesting technique. The technique was expanded rapidly around the project site within Partalo. The technique was also extended to other villages long away from Partalo, namely Chemelongion and Kapkun, both of which are remote from Partalo. The technique had good impact to the people. The effect of the rainwater harvesting was proved to be positive with trials of two-year verification in the three sites. From these facts, it can be said that the rainwater harvesting is effective in stabilizing rain-fed agriculture and could be practiced in and over the Study Area, where irrigation is not available.

10. Way Forward

1. *Technical assistance to community by GOK officers especially in surveying catchment area, layout of farm and supervising will be needed to extend the rainwater harvesting technique.*
2. *Technique for rainwater harvesting should be transferred to other GOK agricultural officers to further extension of the rain-fed agriculture beyond the Study Area.*
3. *Though the farming can be practiced as a group, the size of the water harvesting system should not be too big. As the system becomes bigger, there will be more disparity between upper part and lower part of the farm in allocation of water collected from the catchment area. Area would be better not more than 10 acres, though it will depend on the conditions of the site.*

Maize grown in the rain-fed farm

Talbe5.2.5 Livestock Improvement, Buck Scheme (Sandai&Arabal)

1. Background

The Study area is the second largest goat rearing area in the Rift Valley province. The value of goat meat is greater as it is the preferred meat than beef. Goats have been the domestic companions of man since primitive times but the species as a whole has been neglected. As a result of uncontrolled breeding and inbreeding, the size of the goats has become small and is getting smaller and smaller if this situation remained same as the practiced to date. Therefore, the critical areas of development should include the genetic improvement of the goats accompanied with adequate health control measures, suitable feed resources development, and proper management practices for the animals.

2. Subject to Verify

1. *To find out if farmers, given minimum start-up inputs from donors, can carry out goat genetic improvement by cross breeding with an improved buck.*
2. *To find out the applicability and sustainability of the program through carrying out the program in two different locations, Arabal and Sandai, the former being pastoral hilly area and the latter being more or less agricultural oriented area.*

3. Input (30 % of the cost below born by the community except training)

Sandai Location	***Arabal Location***
5 bucks (total 7,750 Ksh)	*5 bucks (total 7,750 Ksh)*
Transportation of the Bucks (2,000 Ksh)	*Transportation of the Bucks (2,500 Ksh)*
2 castrators (total 12,600 Ksh)	*2 castrators (total 12,600 Ksh)*
5 choppers (total 32,400 Ksh)	*2 choppers (total 12,960 Ksh)*
Training (improved breeding + record keeping)	*Training (improved breeding + record keeping)*

4. Implementation Process

Sandai Location	***Arabal Location***
1. *5 breeding groups with a total 50 members were formed in early June, 2000.*	1. *5 breeding groups with a total 36 members were formed in early June, 2000.*
2. *5 backs were purchased in Kimose and delivered to the groups on June 12, 2000 (the groups' due, 2,925 Ksh, was not settled on time and finally they paid at the end of August 2000 after several times negotiations).*	2. *5 backs were purchased in Kimose and delivered to the groups on June 13, 2000 (the groups' due, 3,075 Ksh, was paid on the same day as agreed with the Study Team).*
3. *The bucks started mating in August 2000, and to date the bucks have mated about 50 does (record keeping is very poor).*	3. *The bucks started mating in August 2000, and to date the bucks have mated 115 does (record keeping is very good).*
4. *Castration started in July 2000, and 120 he-goats were castrated in the following few months. Then, no authentic records of the castration and even the fee collected became available.*	4. *Castration started in October 2000, and 9 bulls and 317 he-goats have been done as of September 2001. The record including the fee collection is kept well.*
5. *To date, death of 2 improved bucks has taken place.*	5. *To date, all the 5 backs are very well, however death of 5 crossbred kids has taken place.*

5. Output (originally expected/programmed)

Item	***Sandai***	***Arabal***
Crossbred offspring:	*24 born and 22 expected*	*43 born and 72 expected.*
Offspring died:	*No record*	*5 offspring*
Improved-buck died:	*2 bucks*	*No back died*
Increase in birth weight:	*1.8 kg to 3.0 kg (average)*	*1.8 kg to 3.0 kg (average)*
Castrated livestock:	*at least 120 he-goats*	*317 he-goats and 9 bulls*

6. Evaluation (in a rating of 1-5)

Aspect	*Sandai*	*Arabal*	*Description*
1) Efficiency	*2*	*4*	*In Sandai, 2 improved backs died mainly because of poor management thereby 2 is given, while Arabal recorded high performance.*
2) Effectiveness	*3*	*4*	*Though 2 improved goats died in Sandai, the cross bred kids were proved genetically improved (the weight increased to 1.6 times of local ones). Therefore, 3 given in Sandai and 4 in Arabal.*
3) Relevance	*2*	*4*	*Sandai area is more or less agriculture oriented, therefore the groups did not give much keen interest to take due care of the bucks except two female custodians. In Arabal, goats rearing is very important since the area is dominated by hills with little farms.*
4) Sustainability	*2*	*4*	*Taking into account the fact that 2 out of 5 bucks died in Sandai, the area as a whole may not well sustain the program. In Arabal, the high performance ensures high sustainability.*

7. Capacity Building

There are 2 female custodians out of the five in Sandai (no female custodian in Arabal). Their performance is very good as compared to male custodians as shown below, thereby they became very proud as well as self-confident.

Sex	*Name*	*Start Mating*	*No of kids*	*Expecting kid*	*No of kids dead*
Female	*I. Kiploman*	*August*	*21*	*10*	*0*
Female	*E. Katero*	*-do-*	*1*	*12*	*0*
Male	*D. Chepkuto*	*-do-*	*2*	*0*	*Buck died*
Male	*C. Rotich*	*-do-*	*0*	*0*	*Buck died*
Male	*D. Kibon*	*-do-*	*0*	*0*	*No libido*

8. Impact and Outcome (others than originally expected)

Motivated by the improved offspring in weight, 10 farmers in Arabal went to Kimose and purchased total 13 improved goats mostly at their own expense at the end of September 2000. The price was 2,200 Ksh per head, which is much higher than the originally purchased one of 1,550 Ksh, but the farmers raised almost all the fund by their own initiative.

9. Verification Result

1. *Arabal showed a much better result than Sandai. In Arabal, no bucks died, while in Sandai two bucks died and one other became ineffective (low libido) due to poor management (no de-worming done in Sandai). Despite greater poverty in Arabal (no good agricultural land), they made very effort including de-worming to fully utilize the development opportunity – buck improvement by cross breeding. The hilly area, preferable for goat rearing, also helped the buck improvement program in Arabal.*
2. *The fact that Sandai farmers are more or less agriculture-oriented giving first priority to crop has hindered their breed management. Also, the swamp areas in lowland Sandai that are used traditionally as all-season grazing area for both cattle and goats have often negatively affected the animal health.*
3. *In summary, it can be said that the both farmers can carry out goat genetic improvement by cross breeding. However, the output depends very much on the area's situation. In general, the more pastoral area would have better result and the more agricultural oriented area would have less performance. Also, swampy area, though it is a nice grazing land, would raise the animal mortality due to the contagious situation unless animal health care should be well taken.*
4. *People's attitude toward development is also one of the keys to success. Arabal area has been less blessed with development opportunities, while Sandai area much more blessed with those in the history. Sandai people apparently showed dependency syndrome on the course of the program while Arabal people were very keen to fully utilize the development opportunities. Cost sharing for bucks is just one example; Arabal custodians settled their due (30%) before the delivery of the bucks while the Sandai custodians were so reluctant to pay that the Team had to negotiate more than 10 times even if they are much wealthier than the ones in Arabal. Thus, the people's attitude greatly influences the result.*

10. Way Forward

1. *Arabal can be expected to develop to be an important improved goat breeding area, while Sandai, until a significant attitude change for the better is effected, will not develop as the breeding area.*
2. *The Chief of Arabal introduced "transect approach" to allocate the 5 bucks. The Arabal location was divided into five areas by its natural and social conditions, and then each area got one improved buck. This approach is very useful and should be applied in cases of doing similar project.*
3. *As Arabal farmers bought additional bucks individually, the program may tend to be individual basis in its nature. Taking into the buck price, 1500 to 2200 Ksh per head which is about 2 to 3 local goats selling price, many farmers seem to be affordable to buy individually. Therefore, the group based scheme tried in this verification may be preferable as a pilot and also for poor people who cannot afford to buy the buck individually. However, even if individual basis prevailed, technical advice of selecting bucks and its transportation of the back should be assisted by the program.*

Table 5.2.6 Livestock Improvement, Dip Improvement (Sandai&Arabal)

1. Background

The Study area is blessed with large number of livestock; 62,000 cattle, 230,000 goats, and 55,000 sheep. One of the critical areas of this livestock sector development should be adequate health control measures because tick-borne diseases are taking a great toll of livestock population. Dipping system can be seen at many paces over the Study area, serving the livestock's health control and improvement. However, very often observed are just dormant or already abandoned dipping systems.

2. Subject to Verify

1. *To examine if farmers can manage a dip system sustainably after receiving very minimal start-up inputs and training from donors.*
2. *To find out any differences in trying the sustainable operation of the dip through carrying out the program in two different locations; Arabal and Sandai.*

3. Input

Sandai Location	***Arabal Location***
1 Pump set (37,749 Ksh) *1 Hand sprayer (12,200 ksh)* *Training (dip management + leadership)*	*1 Pump set (37,749 Ksh)* *1 Hand sprayer (12,200 ksh)* *Training (dip management + leadership)*

4. Implementation Process

Sandai Location	***Arabal Location***
1. *There was a poorly performing dip committee in place before the verification project started. The community was asked to elect a new one. But this took very long time – due to power politics in the community; the Chief kept on postponing the elections.* 2. *Water in the dip sump was replaced even before the verification project started. The community hired a water bowzer that ferried water from Marigat at the cost of 9,250 Ksh.* 3. *Acaricides was managed on July 4, 2000 in an opaque way from an institution.* 4. *Dipping done fortnightly since July 2000, but it has not been accurately recorded despite the repeated advice by the Team.* 5. *Committee meeting not held in most of the cases.*	1. *A very active dip committee was elected in May 2000, facilitated by the Team.* 2. *Removal of dip spent was done on May 14 2000 which was a heavy exercise as the dip had been out of use for a long time. The spent was pumped out using the new water pump. Community participated in removing the soil, stones and wood in the dip sump.* 3. *Acaricides was purchased on July 13 2000 with a loan of 30,000 by the Team (total cost 42,000 Ksh).* 4. *Since July 2000, dipping has been done weekly and until September 2001, 2,747 cattle and 2,964 shoats have been dipped.* 5. *Committee meeting held regularly and monthly.*

5. Output (originally expected/programmed)

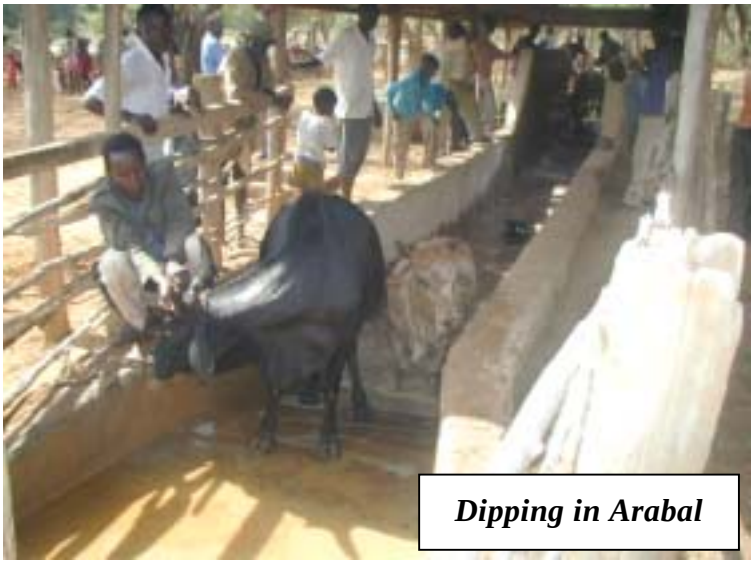
Item: *No. of dipped livestock*

Sandai:

Not recorded despite periodical advice by the Team. However it is estimated at about 300 cattle and almost same or little more number of shoats per month.

Arabal:

2,747 cattle and 2,964 shoats from July 2000 to September 2001 (about 230 cattle and 250 shoats per month)



Dipping in Arabal

6. Evaluation (in a rating of 1-5)

Aspect	*Sandai*	*Arabal*	*Description*
1) Efficiency	*2*	*2*	*Though input required for re-activating the dip system was small, the number of the dipped livestock was not big either taking into consideration the total livestock number in both areas; 4,500 cattle and 17,500 shoats in Sandai and 4,000 cattle and 20,000 shoats in Arabal.*
2) Effectiveness	*2*	*2*	*Though the dip solution of Acaricides works very well, livestock brought to the dip was not many, thereby the effectiveness is not high.*
3) Relevance	*2*	*2*	*Though dipping is effective, it is very difficult to bring animals to the dip especially during dry season since they are herded far away. Hand sprayer may be applicable under this condition.*
4) Sustainability	*2*	*2*	*To sustain dip at the present fee of 10 Ksh/cattle and 2 Ksh/shoat, considerable number of cattle, say 300 cattle and 500 shoats, have to be kept on dipping monthly. It is difficult to sustain these number.*

7. Capacity Building

Record keeping has been well done in Arabal, through which the secretary and the treasurer have cultivated the capacity in accounting and general administration.

8. Impact and Outcome (others than originally expected)

Not observed.

9. Verification Result

1. *To sustain the dip with the present fee of 10 Ksh/cattle and 2 Ksh/shoat, at least the number of livestock shown in the table below should be dipped monthly (raising the fee cannot get villagers consensus).*

Cattle	*Shoat (goat and sheep)*
405	*0*
400	*25*
350	*275*
300	*525*

2. *Though Arabal dip committee has been operating very transparently with their utmost effort, they have received only about 200 cattle and 50 to 100 shoats during dry season. This is because the villagers have to take their herd to farer places during dry season, sometimes to as far as Laikipia, to seek for animal food. This situation makes it very difficult to sustain the dip system, and they have already failed to pay back the loan (30,000 Ksh) provided by the Team.*
3. *In Sandai, the livestock is not moving so much because there are nearby swampy areas where animal are grazed. It seems that the dip system has been operating better than the one in Arabal. However, record keeping including dipping fee collection has not been transparent, thus the opaque management of the dip committee would greatly hinder the sustainable operation. Also, estimated dipping number of about 300 cattle with probably same or little more number of shoat is still not enough to financially sustain the dip.*
4. *Why they do not bring many livestock to the dip, despite the large number in those areas (see table below) and despite the fact that they are mostly aware of the animal health, may be very much related to the less cash availability in the rural areas. Literally and actually, they regard their livestock as their savings rather than practicing actual cash saving in a bank account. Commercial bank is not acceptable for rural people due to the distance and the minimum depositing system(3,000-5,000Ksh for commercial bank). Therefore, cash flowing and also the availability in rural areas are very much limited, thus making it difficult to avail dipping fee at any time. This must be contributing to the less sustainability of the dipping system.*

Reference: Estimated livestock number in the Areas

Location	*Cattle*	*Shoat*
Sandai	*4,500*	*17,500*
Arabal	*4,000*	*20,000*

10. Way Forward

1. *In both cases, the program indicated that the dipping system is very difficult to be sustainably operated. Though generalization cannot be done, it could be at least said that the dipping system located at a place where livestock moves in a wide range seeking for fodder is very difficult to be sustained. Therefore, handspray rather than dipping system, which moves together with the livestock, may well be adapted in that situation.*
2. *In Sandai, the Location Development Committee, supreme committee in the Location, should work as the advisory committee to the existing dip committee in order to improve the opaque management. The dip committee should basically function as the executing committee but not as the decision making body.*

Table 5.2.7 Rehabilitation of Pan (Rugus)

1. Background

Excavation of the Pan has ever been implemented in and over the Study Area with the assistance of NGOs/GOK to alternate the source of safe drinking water (Groundwater along the Rift Valley does not suite for domestic purpose due to high fluoride content). It is, however, observed that most of the pans have been left silted up without any maintenance, instead of that, new pans have been repeatedly constructed.

2. Subject to Verify

To examine whether the pan could be sustainably maintained by the community beneficiaries rather than investing in new pan elsewhere.

3. Input

1. *Materials (cement, wood, wire etc.) required for Pan rehabilitation: 47,570Ksh (10% borne by community)*
2. *Three days renting of bulldozer: 80,000Ksh (10% borne by community)*
3. *Materials (cement, wood, wire etc.) for water tank: 62,580Ksh (10% borne by community)*
4. *Transportation of materials: 33,000Ksh (10% borne by community)*
5. *Skilled labor: 20,000Ksh (10% borne by community)*
6. *Tools for earthwork (wheelbarrow, mattock, Jembe etc.): 23,220Ksh (Grant by the Study Team)*
7. *Unskilled Labor: 660 man-date (59,400Ksh) (100% borne by community)*

4. Implementation Process

1. *Desiliting of Lekiricha Pan for 0.5 - 1.0 m depth with 60 – 70 m diameter was initially planned to do by manual work from the viewpoint of establishing sustainable maintenance. But after trial, the community and Study Team agreed to use heavy machinery with 90% subsidy to the community because the soil was too compacted to dig by manual. Desilting operation by bulldozer was completed in three days in the middle of Apr. 2000.*
2. *Excavation of silt trap of 10m x 10m with max depth 1.5m by bulldozer was completed at the same time of desilting operation.*
3. *400m fencing around the pan and silt trap with thorn bush and Rapai plant was done by the community. Community decided to fence off the pan and silt trap with locally available resource and completed in one months (Jun. 2000)*

Lekiricha Pan after Desilting

4. *Outlet with filter, well and watering place for animals by community labor and skilled worker. It took about eight months (from Jul. 2000 to Feb. 2001) longer time than expected to complete due to low turnout of community members for earthwork and disturbance by ethnic conflict.*
5. *Grass planting on pan embankment by community women was done during rainy season in Aug. 2000, but the grass withered during dry season.*
6. *Tree planting in the catchment area was agreed to be undertaken by the District Forestry Office, but it has not been done.*
7. *Roof catchment water tank with 15 cum at Rugus Primary School was constructed as to support non-beneficiaries of Lekiricha Pan and 100 pupils of Rugus Primary School. Water tank was completed in two months (Oct. and Nov. 2000) by the community and skilled worker.*
8. *Pan maintenance group was established with 13 committee members and the beneficiaries of four villages.*

5. Output (originally expected/programmed)

1. *By Sept. 2001, rehabilitation of Lekiricha Pan was completed except for tree planting in the catchment.*
2. *Retention of water in the pan extended from two (2) months to more than four (4) months throughout a year and people can now fetch water even from the silt trap.*
3. *Pan committee was not active and the leadership was taken over by the location Chief.*
4. *The installed filter/well is effective. Through the filter, water becomes transparent and content of colon bacilli reduced much. However, water level of the well gets low as the water level of the pan lowers, making it difficult to fetch water from the well. Although the filter/well is effective, people do not drink the water from the well because they say water smells and tastes strange and there even occurred a rumor that their ethnic opponent poisoned the water. The smell could be attributable to concrete dust in the well and it is expected to disappear after rotations of water.*

Communal Work for Outlet

5. *Water tank was completed in November 2000 and well functioning. It serves 100 pupils of Rugus Primary School as well as nearby residents.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*3*	*Rehabilitated Pan was immediately used when the rainy season came, though the earthwork by community took longer time than expected.*
2) Effectiveness	*2*	*Although the pan can retain water longer than before the rehabilitation, the output was still lower than the beneficiaries' original expectation, leading to discouraging them to pay the cash contribution.*
3) Relevance	*4*	*Although the pan dries up during dry season, there are no other options in this area than excavating pan for supplement safe water since the groundwater contains much fluoride and the nearby rivers are seasonal. Therefore the relevance of the project is judged to be high.*
4) Sustainability	*2*	*Although the pan is very much needed as a BHN in this high fluoride content area, it is very difficult to sustain the regular maintenance of Pan without regular input from outside. This is because the people have to diversify their activities under ASAL condition, leaving pan unattended especially during dry season that is suitable for desiltation.*

7. Capacity Building

The community by their own initiative started digging a channel to divert water from Mukutani River to utilize the pan more effectively. It can be said that the community was motivated for further improvement of the pan by seeing the rehabilitated Lekiricha Pan. People leaned how to use tools such as wheelbarrow and folk jembe during the rehabilitation work and they look more confident in achieving the digging work.

8. Impact and Outcome (other than originally expected/programmed)

1. *Output lower than their original expectation may have both positive and negative impacts. In case of Rugus, people showed positive attitude to further improve the pan by their own initiative, namely diverting seasonal river water into the pan. On the other hand the lower output might become a factor to discourage people to take further action for development.*
2. *With respect to negative impact, the community refused to pay cash contribution. The reason, they said, was that the output was less than their expectation (water smelt and taste strange). However it might be a strategy to reason their nonpayment. Arrangement for cash contribution without any payment until the end might have retained their dependency.*

9. Verification Result

1. *Though the rehabilitation was once completed, maintenance work by community has not been done and silting is again proceeding. This is because men have to take their animals far away during dry season, which is the most suitable time for desilting. Accordingly, the pan committee lost its function because they were busy looking for their own food. People here have to be engaged in various activities such as animal herding, farming, fishing hunting etc. for their survival. It is therefore evaluated that the sustainable maintenance of the pan by the community in such diversified nature seems very difficult.*
2. *Water tank can be an alternative water source with much less maintenance where there are wide roofs available for collecting rainfall.*

10. Way Forward

1. *Though we could see the positive attitude of the people toward the improvement of the pan, diversified activities of the people for survival will still dominate their interest. It is, therefore, difficult to sustain the regular maintenance of Pan by community themselves under Semi-Arid conditions, though it should not be over generalized. Therefore periodical intervention such as food for work or cost-sharing on heavy machinery by GOK/Donor will be needed for the sustainable maintenance of the pan.*
2. *Health promotion in association with water project will be necessary for better communication with community and for better understanding on safe water. For example of the smell of filtered water, health staff can support the community to understand the effectiveness of the filter/well in longer term.*

Outlet Well: Pan Water is filtered

3. *Women had important role during the implementation in such a way of contributing labor. Women had worked for fencing and grass planting and even for earthwork, which basically should be men's work. Gender issues should, therefore, be coordinated in the community-based project.*
4. *As the water tank is functioning well, this facility can be installed where the wide roof to catch enough rainwater is available.*

Table 5.2.8 Participatory Irrigation Management + W. Saved Agriculture (Sandai)

1. Background

Sandai community has developed an irrigation system of 700 acres with the assistance of GOK. However, irrigation efficiency is low because of high seepage losses, poor maintenance of water channels and lack of sound water allocation and distribution. It is considered that improvement of the irrigation water management will enable to increase irrigation efficiency leading to increase of agricultural production.

2. Subject to Verify

To examine if the community can sustainably rehabilitate, operate and maintain the irrigation system without GOK/Donors' periodical intervention.

To examine if the land leveling practice as on-farm water management can be built in the irrigation system to contribute to water saving in a plot and thereby making it possible to distribute water into wider areas.

3. Input

1. *Materials for canal lining (cements, wood, equipment for concrete mixing etc.): 270,490Ksh (30% borne by community)*
2. *Materials for diversion boxes (steel gates, cements, wood, ballast etc.): 260,715Ksh (30% borne by community)*
3. *Skilled Labor for canal and diversion boxes: 141,400Ksh (30% borne by community)*
4. *Transportation for canal and diversion boxes: 448,000Ksh (30% borne by community)*
5. *Tools for canal and diversion boxes (mattock, jembe, wheelbarrow etc.): 43,720Ksh (Grant by the Study Team)*
6. *Unskilled Labor for canal and diversion boxes: 1,480 man-date: 133,200Ksh (100% borne by community)*
7. *Land leveler and operator: pilot 9 acres: 47,140Ksh (30% borne by beneficiaries)*
8. *Seeds for water saved agriculture: 1,680Ksh (100% borne by beneficiaries)*

4. Implementation Process

1. *Masonry lining of main canal for 300m from intake was done (See right photo). Though the lining work was progressed on time, community participation in manual labor decreased day by day. Misunderstanding between community and GOK/JICA Study Team on community's cash contribution and labor participation led to delay of community's payment.*
2. *Six division boxes with gates were planned to install in the main and secondary canal. Diversion boxes were installed after the completion of the canal lining, according to the community's perform ance of cash contribution. Installment schedule of cash contribution was made, but the community could not follow the schedule with some excuses such as school fee, drought, etc.*
3. *Land leveling for water saved agriculture was operated to the seven selected farmers. Though land leveling was implemented on time, severe prolonged drought delayed the cropping.*
4. *Study tour for NIB Perkerra irrigation scheme was conducted as part of water management training.*

Canal Lining of 300m

5. Output (originally expected/programmed)

1. *Canal lining of 300m was completed in August 2001.*
2. *Three diversion boxes out of six were installed by November 2001. Remaining three gates have been stored in the Divisional Office in Marigat because of poor cash contribution of the community.*
3. *17%(56,000Ksh) of cash contribution has been completed. Remaining due for the community is about 280,000Ksh.*
4. *In 2001, with the increase of irrigation efficiency and rotational irrigation, 90% of the irrigation farmers got sufficient water as compared to planned target of 60%.*
5. *Crop area for cash crops such as tomatoes and watermelons were increased and French beans were newly introduced in 2001.*
6. *Land leveling increased on-farm irrigation efficiency by about 50% as compared to the irrigation hours without land leveling (average of five sample farmers).*
7. *Land leveling increased the crop yield by 30 % as compared to the yield without leveling (average of five sample farmers).*
8. *The irrigation area expanded around the leveled farms.*

Diversion Box

Farm after Land Leveling

6. Evaluation (in a rating of 1-5)

1) Efficiency	*4 (2)*	• *Construction work was completed on time and could catch up with the first rainy season when people started cropping. Also utilizing locally available materials minimized the construction cost.* • *As for land leveling, its cost including transportation was high because only large scaled machinery was available, though the operation was effectively implemented.*
2) Effectiveness	*4 (4)*	• *About 90% of the farmers got enough water against the planned target of 60%, and they now feel more confident to take even risks to try new crops such as French beans and tomatoes.* • *The land leveling practice was also effectively implemented and contributed to yield increase, saving irrigation water thereby expanding irrigated area.*
3) Relevance	*4 (3)*	• *Sandai irrigation scheme was one of the few irrigation schemes in the Study Area and improvement of irrigation efficiency without exploiting new water source under scarce water resource in ASAL was relevant as a development approach.* • *Land leveling is an effective method to save irrigation water, but the shortage of available machinery constrained the approach.*
4) Sustainability	*2 (3)*	• *In spite of high effectiveness of the project, farmers' organization and institutional reform in this community is extremely challenging and requires considerable time and patience since dependency has deeply rooted in this community. Therefore, while the efficiency, effectiveness and validity of the project are considered to be high, sustainability should be rated as poor. It is probably very difficult to sustain the irrigation system by the community without periodical rehabilitation assistance.* • *As for land leveling practice, it is still difficult to build-in the whole irrigation system unless the implementation cost is reduced.*

7. Capacity Building

1. *Although the project was successful in terms of efficiency and effectiveness, there is not significant evidence about people's capacity building. People's attitude of dependency still remains and most of the community members are reluctant for the cash contribution (only 17% of total due has been collected.). However, it was observed that the Chief of Sandai location showed positive attitude and discretion in organizing community and one beneficiary of land leveling expressed on his future vision not to depend on donors. Except for few community members, they might have learnt little from the project.*
2. *There was another small irrigation system on the other side of the river, left out from the project. However the people on the other side rehabilitated the canal by their own initiative. Project could bring a significant disparity in the community, but also it may bring stimulant to the people.*

8. Impact and Outcome (others than originally expected/programmed)

Project triggered latent leadership conflicts as a negative impact, particularly with regard to a contract with a community member who owned a vehicle for materials transport. Employment created by projects can be a seed of community internal conflicts over benefits.

9. Verification Result

Although the project was effective, people's dependency still seems remaining, e.g. at the first week of canal lining work, 80 to 100 people joined the earthwork and the number decreased to 10 after they knew there was no payment for the work from the Study Team. Finally 6 youths remained but in fact the contractors who were hired by the Study Team were unwillingly giving them pocket money. The approach by Donors to count community labor as their part of cash contribution may have promoted the dependency, diminishing their sense of ownership. Rushing implementation bound to the administrative/budgeting condition may also have curtailed people's initiative. Unless otherwise GOK/Donors change their approach to the community and vise versa, sustainable participatory irrigation management, including the rehabilitation, is very difficult due to the deep-rooted dependency replenished in the long history of external assistances (Their behavior of getting assistances from donors is even sophisticated.).

10. Way Forward

1. *For the subsidy arrangement, community should be involved in cost estimation and budgeting from the initial stage and be given notification for the project cost at the earliest stage.*
2. *A certain part of project cost may be required as the community's commitment prior to the project commencement, so that they drive their initiative and motivation.*

Table 5.2.9 Small Scale Industry（Kampi ya Samaki）

1. Background

Kampi ya Samaki is a place blessed with high potential of business including tourism and fish. People in this area are highly diversified with different ethnic groups and different businesses. Women here have been engaged in small-scale businesses to supplement their household income.

2. Subject to Verify

1. *To examine if women could utilize, through a group activity, their resources (tourists, fish, honey, handicrafts) to generate income sustainably.*
2. *To examine if capacity building of women could be realized through the preparation of multi-purpose building and business, so that their various own development activities go on in dynamic way and continuously.*

3. Input

1. *Allotment of 1,000m^2 plot from Baringo County Council (Ksh3,200 including site planning, land survey, inspection and provision of certificate, 100% of cost borne by the women's group)*
2. *Multi-purpose building of 210 m^2, six rooms and a kitchen (Ksh1,350,000 (10% of cost, Ksh135,000, borne by the women's group) + Ksh207,915 for the extra cost (Ksh4,010 borne by the women's group))*
3. *Electricity wiring, Ksh87,000 (10% of cost, Ksh8,700, borne by the women's group)*
4. *Toilet, Ksh65,000 (10% of cost, Ksh6,500) borne by the women's group)*
5. *Utensils, honey bottles, labels and beehives for business (100% of cost, Ksh30,198, borne by the women's group)*
6. *Leadership trainings (leadership, general management and election), technical trainings (handicraft, honey and fish processing), and business trainings (financial management, business skill and budget planning)*
7. *Study tour for handicraft marketing to Nairobi and Mogotio*

Note: The women's group had finished all the repayment of Ksh184,408 (Ksh460/woman) to JICA and Ksh3,200 for land acquirement. They were during the course of fund raising of about Ksh400/woman for business operation)

4. Implementation Process

1. *United women's group of 401 members was organized for the construction of multi-purpose building and business operation.*
2. *The building construction was completed in the end of September 2001, delayed for ten months from the initial plan because the contractor did not execute the contract due to price escalation of materials and opaque management of money. Finishing work of rear three rooms was carried out under the control of women's group, rather than contract base between JICA and contractor.*
3. *Series of trainings and study tour were provided on time and utensils and materials for business operation were also purchased as planned.*
4. *Business start delayed due to the construction delay and size of the building was too big to start with. Business finally started with a handicrafts & honey shop in September 2001.*
5. *At the initial stage of business operation, stock of handicrafts and honey were limited. The climate condition was the factor to have limited the resources of honey and plant materials for handicrafts.*

5. Output (originally expected/programmed)

1. *Existing 18 small women's groups were united to form Lake Baringo Muungano Women Self-help Group with 401 members.*
2. *Building (see photo) and toilet construction were completed by September 2001. Fencing, tree/flower planting under preparation (initiated by women's group).*
3. *Women acquired skills in honey/fish processing, handicraft making, business management, etc.*
4. *Two baskets, four bangles, two belts, three necklaces and one chair were sold in two weeks.*
5. *38 bottles of honey were sold in two weeks.*
6. *Restaurant not yet open.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*2*	*Building construction delayed 10 months since the contractor did not execute the contract due to price escalation of materials and opaque management of money. It resulted in postponement of business commencement. Efficiency for the building construction is evaluated to be poor. As for business promotion, data is not enough to evaluate the efficiency at this moment.*
2) Effectiveness	*N.A.*	*Due to delay in building construction and commencement of business, realized sales of handicrafts and honey were limited. Certain income for members was not recognized yet. Effectiveness is not available to evaluate at this moment.*
3) Relevance	*N.A.*	*Relevance is not available to evaluate at this moment.*
4) Sustainability	*N.A.*	*It is too early to evaluate sustainability at this moment. However, women's group, especially committee was strengthened and intention to continue their business utilizing multi-purpose building and further expansion has shown up.*

7. Capacity Building

1. *Committee members had cultivated strong leadership through great number of meetings (61 meetings (32 committee and 29 general meetings) during 19 months since the women's group was organized) and activities required for fund raising, plot acquirement, building preparation, business planning, procurement of materials for business operation, etc. Especially, great change was observed for the leadership of the chairlady; compared with the inaugural speech in 1999, her voice and attitude had full of confidence during the recent general meetings and workshops after experienced all above.*
2. *Members of women's group have become more self-assured and were able to initiate own activities. For example, the chairlady of the group sent her husband to a tourist hotel in Kampi ya Samaki to market bottled honey, some of the members were preparing tree/flower seedlings to plant in the building plot, and fund raising for business preparation and fencing was completed. These activities were all initiated by the women's group.*
3. *Members of the women's group learned to trust, cooperate and unite in a group and with different ethnic groups. Basically women in the area used to form a women's group within the same ethnic group, but through the activities of verification project, they decided to work as one united group rather than the separated groups to keep equal balance among members.*

8. Impact and Outcome (others than expected/programmed)

1. *Women were encouraged to discuss and visualize their future development plan such as extension of their plot and management of petrol station. They are eager to continue their own development activities.*
2. *The project attracted other groups outside of the area to have similar projects or to have linkage with the Muungano women's group. For example, some women from outside of the area had visited the handicraft shop and showed interest to market their handicrafts, or beekeeping groups from other location requested divisional officers to sell their honey to the women's group. Future possibility of networking among different communities was recognized.*
3. *Concerning about negative impact, husbands of some members did not prefer to have wife engaged in time-consuming activities and complained. It might bring domestic problems.*

9. Verification Result

1. *Availability of resources to generate income, such as honey and fish, fluctuate depending on the natural condition, especially precipitation of the year. During the drought year honey production becomes low while fish production increases. On the other hand, honey production recovers in the following year if there is enough rain, while fish production becomes low due to over catch of the previous year. In ASAL areas, income generating activities should be diversified to secure certain level of income and stabilize livelihood, rather than concentrating on one business even though it has high potential of development.*
2. *Preparation process of the venue (multi-purpose building in case of this project) has strengthened, united and activated women's group and they gained self-confidence.*

10. Way Forward

1. *Continuous rather than intensive, but ad hoc support/training is required from GOK side, especially in skills of business planning, record keeping and accounting. Training courses provided during the verification period had some effect for business preparation, but additional support at the right timing helps them remember and practice the obtained knowledge. Women's group is expected to look for outside market for their products, especially bottled honey, with the assistance of GOK.*
2. *Women's group is expected to complete electricity connection and operate restaurant, as well as the continuous sales of bottled honey and handicrafts.*
3. *For future implementation of such project, small scale is preferable to start with, and scale of input could be enlarged step-by-step in accordance with the group capacity. In such way, benefit, though it's small, could be realized from the earlier stage and it would facilitate the group to continue their activities.*
4. *Contract for building construction was made between the contractor and Study Team, but women were involved only for the selection of contractor, and the contractor did not listen to the women's claim for the construction delay. On the other hand, training courses were mostly planned and provided by the Study Team and degree of involvement of women's group was low, and some of the courses had a poor reputation. Beneficiaries should therefore be involved not only in the planning stage of the project, but also all the process of implementation stage.*
5. *For the development of income generating activities in ASAL areas, diversification is necessary to stabilize certain level of income, considering unreliable resources over years.*

Table 5.2.10 Rural Water Supply (Upper Mukutani)

1. Background

Delineation of the territories between Il Chamus and Pokots in the north edge of Upper Mukutani has been a cause of strife between the two ethnic groups. They share the natural resources around the border including an unprotected spring located at the side Il Chamus territory, which is one of the main water sources of domestic use and livestock for both ethnic groups.

2. Subject to Verify

To examine if the development can contribute to social stability where two tribes compete for the same source.

3. Input

1. *Materials (pipes, cements, Sand, culverts, plumbing accessories etc.): 1,200,000Ksh (10% borne by community)*
2. *Tools (Mattock, Shovel, Pipe cutter, Hand saw etc.): 60,000Ksh (Grant by Study Team)*
3. *Skilled Labor: 240 man-day: 216,000Ksh (Grant by Study Team)*
4. *Unskilled Labor: 1,210 man-day (100% borne by community): 109,000Ksh*
5. *Transportation: 254,000Ksh (Grant by Study Team)*

4. Implementation Process

1. *Construction started from July 11, 2001 and completed on September 22, 2001.*
2. *The community completed digging work for the pipeline trench (from July 11 to July 21, 2001).*
3. *Pipe-carrying by the community was completed (from August 1 to August 2, 2001) and pipefitting by skilled worker was completed by mid of August, 2001.*
4. *Training to 35 community members in organizing self-help operation and maintenance group by Department of Social Services was conducted on August 6, 2001.*
5. *Construction of intake structure and cattle trough by skilled worker was completed on August 11, 2001.*
6. *Outlet was completed on September 7, 2001 (earthwork by community from July 28 to August 3, construction by skilled worker from August 4 to September 7).*
7. *Appurtenant work by skilled worker was completed (from September 18 to September 22, 2001).*

Water Source (Spring)

5. Output (originally expected/programmed)

1. *Construction of water supply system completed (intake, pipeline, storage tank and out let, stand pipe and taps, two cattle troughs.*
2. *The spring located in IlChamus territory has been well protected and clean water is available from the outlet located at the Mukutani center (territory of Pokots).*
3. *Some 80 households or 400 people were estimated to be drawing water from the two water supply taps daily with two villages cutting water fetching distance by 2 Km.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*3*	*Construction was completed with little delay due to much rain. Long distance from town raised transportation cost. Otherwise the water supply facility has been used immediately after the completion of the construction.*
2) Effectiveness	*3*	*Community people can fetch cleaner water from the outlet and distance for fetching water was shortened by 2km.*
3) Relevance	*4*	*Because the project is related to BHN, the relevance of the project is rated high.*
4) Sustainability	*3*	*Since the project only recently was implemented, it is too early to make a conclusion.*

7. Capacity Building

1. *Organization of newly established operation and maintenance group still seems weak.*
2. *Sense of ownership of the community is challenging like other verification project sites. Although at the first time 50 men participated in the communal earthwork, the number of participants decreased and roamed around10 since they knew that the Study Team would not pay for their work.*

8. Impact and Outcome (other than originally expected/programmed)

1. *The community located near the hills would like a similar project using another spring called Lerlerai.*
2. *Competition for water with 7 irrigating farmers could rise particularly during dry season, although the community members including the farmers agreed to control water before the commencement of the project.*

9. Verification Result

Though the project only recently implemented and it is too early to make a conclusion one way or the other, so far the facility has been well used by Il Chamus and Pokots and no significant conflict between the two ethnic groups has occurred.

10. Way Forward

1. *The operation and maintenance group should be mobilized with the assistance of GOK and it is expected that the community members will learn some maintenance work and the Department of Water Development will transfer routine plumbing tools to the Committee.*
2. *In the area, people do not prepare cash at anytime, but save their property as a form of livestock. Therefore the operation and maintenance cost borne by the community should not be charged in a short cycle with small amount but one or two times per year with as much as the price of a goat.*

Outlet

Table 5.2.11 Strengthening of Marigat Youth Polytechnic(MYP)

1. Background

"Youth polytechnics", which were referred to as "Village polytechnics" at the beginning, were started so as to provide training with a view to assist the youth to become self employed or even secure employment. Many "Youth polytechnics" receive substantial support from the GoK and other sponsors, but MYP was a purely a community owned institution with no more regular support from the GoK or other sponsors. Also there is a high demand in the community for better quality products, and for skill training.

2. Subject to Verify

To find out whether MYP can become a hub of network in the community. Potential community groups that were identified for networking included the "jua kali" artisans and the Kokoto Women's group of Kampi Turkana in Marigat.

3. Input

1. *Technical assistance to develop short courses for beginners and short upgrading courses for experienced artisans*
2. *Provision of electrical equipment, materials such as timber and tools for the carpentry workshop*
3. *Training of trainers and a study tour for the management committee, trainees and instructors*
4. *Hiring a carpentry instructor to assist in training in the use of the new equipment and in production of more advanced products*

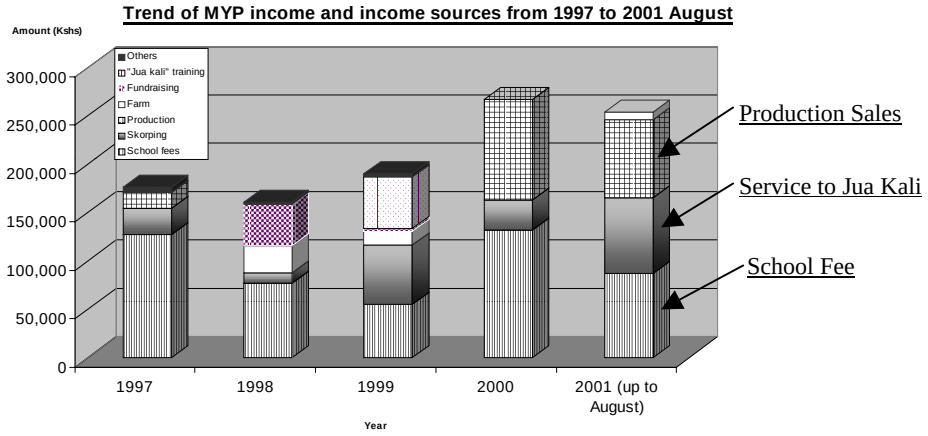
4. Implementation Process

1. *MYP started short courses in June 2000 and forty men and women joined the courses, however, only two registered with money for registration and they transferred to the full 2-year course. For the moment, short courses have been put on hold.*
2. *MYP started renting the equipment to Jua Kali artisans and Kokoto women group from summer of 2000.*
3. *MYP opened a showroom in the town to sell their products in February 2001.*
4. *Relationships between the carpentry instructor and the manager turned sour and the contract for the carpentry instructor was not renewed.*

Provided Equipment

5. Output (originally expected/programmed)

1. *The carpentry workshop was re-organised and is functioning very well although a saw blade was broken and long left unchanged.*
2. *Benefits to the community includes benefits through linkages between MYP and Kokoto Women group which hires tools and have received training in handling ballast and bookkeeping. "Jua kali" artisans also benefit from the use of the new and advanced MYP equipment that has brought such essential services closer and financial status of MYP improved.*
3. *A showroom was opened to sell and display furniture and clothes produced at the polytechnic by trainees and instructors.*
4. *Enrolment increased from 14 and 17 trainees in 1998 and 1999 respectively to 33 and 34 in the year 2000 and 2001. However, MYP still registered relatively low enrolment for its two-year courses, and a very poor response to its planned short courses.*
5. *Total income of MYP increased from Ksh150 thousands to more than Ksh250 thousands.*



6. *Awareness of MYP in the Study Area has increased significantly.*
7. *New designs of furniture have been made, though to a limited scale.*
8. *A machine operator and an accounts clerk were hired to serve clients and to streamline activities in the workshop.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*3*	*Procurement of equipment for the carpentry workshop was relatively too large compared with institution development portion of the verification project.*
2) Effectiveness	*4*	*Income of MYP and "jua kali" artisans increased significantly by the verification project.*
3) Relevance	*4*	*MYP, a community owned institution, could be a hub of community networking.*
4) Sustainability	*3*	*Unless more parents can afford paying school fees, it is not so easy for MYP to sustain with present enrolment rate, production sales and "jua kali" services.*

7. Capacity Building

1. *MYP instructors started to prepare detailed training plans that include lesson plans and timetables.*
2. *MYP workshop became cleaner with instruction and safety measures on the wall.*
3. *MYP management board became to have meeting regularly with attendance of the senior chief of Marigat. He had never been to MYP before the verification project started.*
4. *In the past, record keeping in general was poor, but this has improved since the beginning of the verification project. In particular, the records in the carpentry workshop are very well kept and updated on daily basis.*
5. *MYP instructors started to prepare updated balance sheets of MYP.*

8. Impact and Outcome (other than originally expected/programmed)

1. *Improvement of record keeping has brought transparency and accountability of MYP management.*
2. *Large-scale production of "jua kali" artisans, such as orders for school desks and benches, can now be undertaken competitively and swiftly.*
3. *Hiring of the carpentry instructor brought in salary differentials, confusion in the line of reporting, authority and eventually poor relationships.*
4. *Although conflicts among the management board members have arisen in the past, it seems that they have accumulated to reach an unprecedented high level in 2001.*

9. Verification Result

The polytechnic can serve as network for the larger community, in particular the "jua kali" artisans. However, like many other polytechnics in the region, it is not easy to achieve the financial sustainability of the polytechnic on training only. Therefore, a showroom was opened to sell and display furniture and clothes produced at the polytechnic by trainees and instructors.

10. Way Forward

1. *Like many other polytechnics in the region, it is difficult to achieve the sustainability of the polytechnic on training only. Some form of sponsorship, fund-raising, subsidisation and income generation activities are necessary to achieve this financial sustainability. It is needed to understand the over all situation of polytechnics in the district and the country as a whole. It is also needed to understand the effects of dependency on subsidies by the community and how this is related to enrolment in educational institutions in general.*
2. *Achieving a higher enrolment should always remain the key focus of all MYP stakeholders because training is their core business. In this respect, MYP should intensify awareness creation efforts and ensure that advertisements are posted on the right time to the right target – primary and secondary students on their final year.*
3. *In order to streamline the work of the management and the executive committee, and to guard against misuse of authority, it is necessary to formulate a constitution and to develop clear procedure and systems.*

Visitors to MYP

Table 5.2.12 Strengthening of Marigat Health Center (MHC)

1. Background

PHC is a strategy to achieve "Health for All" as the ultimate goal. Past PHC was weak in interactions between a health institution and a community. Often the distances are so far (physically, socially as well as psychologically) that health staffs, particularly those who are engaged in public health, are demoralized to communicate with a community. In this context, the interaction between the Marigat Health Centre and the communities has become a major focus of PHC in Baringo.

2. Subject to Verify

To examine if the comprehensive PHC concept can be achieved with effective mass media.

3. Input

1. *Provision of equipment for laboratory enforcement: binocular microscope, water quality multi-parameter kit etc.: 2.5millionKsh*
2. *Motorbike: 350,000Ksh*
3. *Information Billboards 110,000Ksh*

4. Implementation Process

1. *Equipment for laboratory was provided in June 2000.*
2. *Information billboards to send the health information to community were put up in 20 sites in September 2000.*
3. *4 kinds of slides for health promotion were developed by the collaboration of MHC staffs from different sections (Clinic, Laboratory and Public Health) and the Study Team.*
4. *Health promotion slideshow in order to motivate health staffs to communicate people was carried out in 11 sites in June and November 2000.*

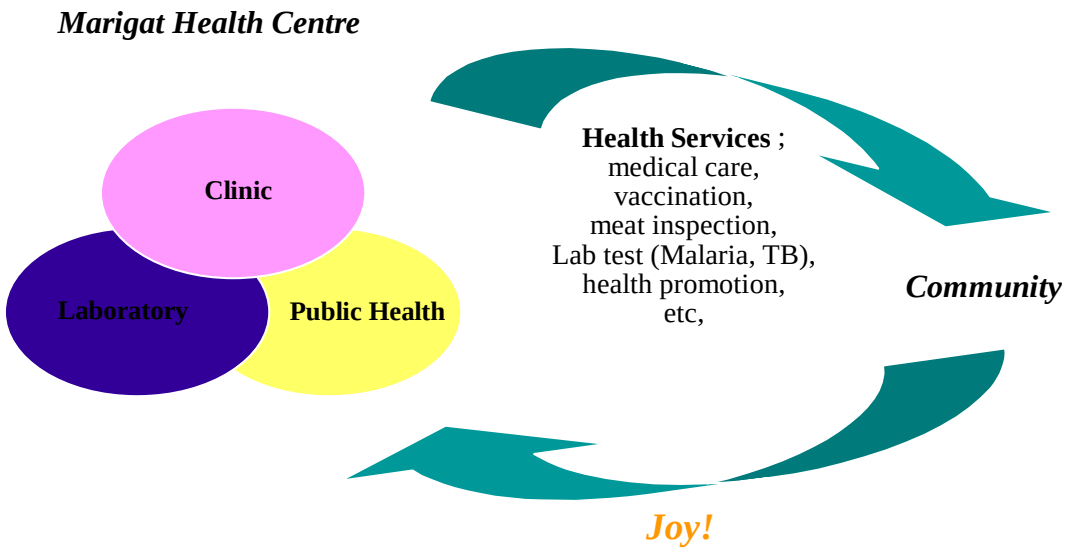


Figure: conceptual overview of PHC interaction

5. Output (originally expected/programmed)

1. *11 slideshows have been performed. 4 slideshow programmes have been developed.*
2. *People's health knowledge enriched (40% of154 interviewee answered that they saw the slideshow and among those who saw the slideshow, 55% acted something like boiling water more frequently than before.).*
3. *Diarrhoeal diseases reduced.*

6. Evaluation (in a rating of 1-5)

1) Efficiency	*4*	*Laboratory is functioning well after development. Cost of slideshow is as small as 500 prints of health promotion poster.*
2) Effectiveness	*4*	*Strengthened laboratory is more contributing to people's health and with slideshow people have got more knowledge about health.*
3) Relevance	*4*	*Because the Study Area has a lot of cases of cholera, malaria, yellow fever etc., PHC strategy is possible way of stopping outbreak of above diseases.*
4) Sustainability	*3*	*Financial stability of Government will constrain MHC activity.*

7. Capacity Building

1. *Incubator was missing in the laboratory, but finally MHC staff improvised an unused refrigerator to function as incubator. Through this improvisation, MHC staff became more confident.*
2. *Through the development of health promotion program and holing the slideshow, multi-sectoral collaboration (clinic, laboratory and public health) was promoted. (Picture on right hand is the preparation of slideshow in a village.)*

8. Impact and Outcome (other than originally expected/programmed)

Not observed

9. Verification Result

1. *It was recognized that mass communications(slideshow etc.) are vital component to fulfill MHC's r responsibility. (in order to serve community's health)*
2. *The staffs in Marigat Health Centre are well motivated and keep their strong will to have close interaction with respective communities.*

10. Way Forward

1. *Maintaining PHC policy with emphasis on the comprehensive PHC concept will be needed.*
2. *In order to continue these communication activities, further external assistance is preferable in the form of slideshow equipment and computer training particularly for digital graphics.*
3. *Collaboration with Ministry of Water will be needed for both health promotion and water resource development.*

CHAPTER 6

Formulation of Development Plan

CHAPTER 6 FORMULATION OF DEVELOPMENT PLAN

6.1 Development Strategies and Project Design Discipline

6.1.1 Overall Goal; Open, Diverse and Flexible Development

The Master Plan formulated in this Study centres on, as the overall goal, improving the living standard of the target beneficiaries in the Baringo Semi-Arid Land Area, (Marigat and Mukutani Divisions). As the beneficiaries live in different local conditions, which are, especially in the ASAL area, complex, diverse and risk-prone, improvement of the living standard should be described in various ways. The conventional approach of centralisation, standardisation and simplification, tried regardless of such diverse conditions, has failed to serve the rural population in the ASAL area.

At the heart of this Study in realising its overall goal is, therefore, decentralised process, diversity and choice aimed at local fit and adaptability. Not offering a standardised package, but providing of a basket of choices, may be better suited to the diverse, complex and risk-prone ASAL area. People can then adapt and fit what they do to their complex living conditions. Here, the development should be decentralised, be open to any choices, become not simpler but more complex, not uniform but more diverse, and not rigid but more flexible.

Given the experience acquired through the verification projects, there are some important findings and common issues that the Study has to feed-forward in designing the development project/programme in the Master Plan and that could be referred to in other projects as well. These findings and common issues are to form the Development Strategies and the Project Design Discipline as given below:

6.1.2 From Results-oriented Approach to Process-oriented Approach

The Study Team has found through the verification projects that there are several characteristics of community-based projects. Firstly, the owners of the projects are villagers. Therefore, participation is the key not only for planning and project designing, but also for implementation, monitoring and evaluation. Participation here means participation by the community in the project at the same time as participation by the GOK administration and donors in the community projects.

Secondly, it is usually difficult to make a precise blueprint for a community project at an early stage so that continuous refining of the original plan is necessary to finalise it. The monitoring and evaluation cycle needs to be fairly short as well. A continuous refinement helps too in the decision-making and cost -sharing processes. For example, the Study Team encountered difficulties in getting the communities to cost-share and a major reason for that is a lack of communication between the community and the Study team and even between the community leaders and the members.

Thirdly, compared with conventional construction projects, objectively verifiable indicators are hard to define for community projects. Consequently, participatory M & E, not relying so much on objectively verifiable quantitative indicators, is more important for community projects. A community project is a learning process for all the stakeholders concerned including the community, its leaders, GOK officers and donors.

Fourthly, even in community projects, there are implementers: usually the community leaders. That means some kind of project management tool is essential for efficient implementation of a community project and also for transparency and accountability. Lessons are: 1) community members need to be involved in initial budgeting, 2) the progress of construction including expenditure needs to be shown on a billboard on time, 3) transportation initiatives and employment of technicians need to be made with or by the community members, and 4) proceeding to the next stage of construction needs to be made in steps with payment on the exact extent of cost-sharing from the community.

To respond to these characteristics, a community project needs to enjoy a continuous process of designing, implementing, monitoring and evaluation. In that sense, evaluation also needs to be a continuous process based on self-rating against a set of criteria which should be applied as objectively as possible.

6.1.3 Flexibility in Planning Programme/Project

The climate of the ASAL area is characterised not only by meagere rainfall but also by the wide range of its fluctuation. Drought periodically comes as well. The average rainfall should be regarded as only a statistical estimate and does not mean it probably takes place once every two years. A wide range of fluctuations associated with periodic drought is the environmental nature of this ASAL area. The following figure shows the last 32 years' wet season rainfall (April-September), giving us a wide range of fluctuation, giving an average of 414mm with a standard deviation of 141mm (34% of the average).

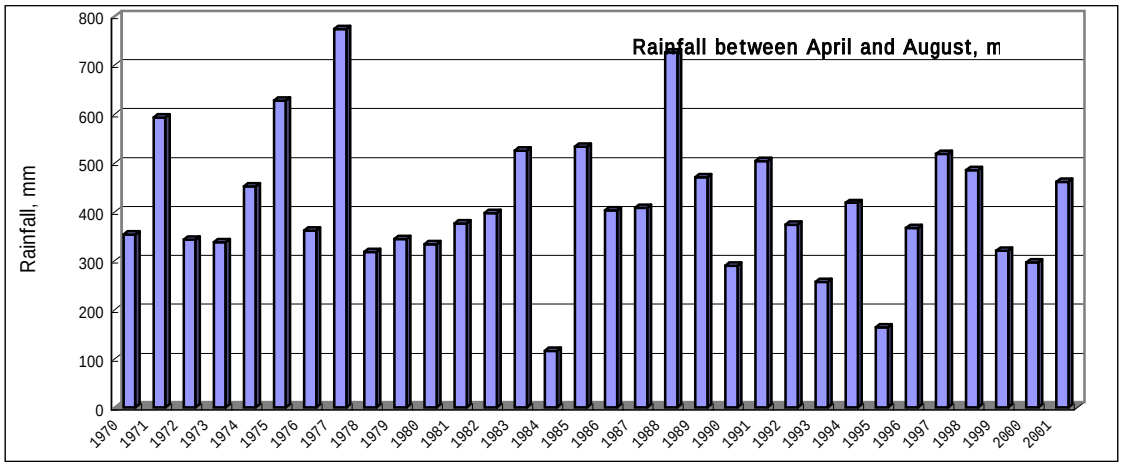


Figure 6.1.1 Rainfall between April and August

Families in the Study Area are large and often polygamous to accommodate the extensive livestock production system. This is a response to environmental constraints and a way of coping with risks. Activities aimed at creating income, or just making ends meet, have also to be diversified in order for people to survive under the harsh semi-arid climatic conditions. Diversity may be a hedge against risk and thus the best survival strategy, which is very different from the living strategy of people blessed with stable environmental conditions. One sees more diversity, a less profit-oriented strategy, and less concentration on any one activity, in those who have to live in ASAL, as against less diversity, a more profit-oriented strategy, and a greater concentration on a particular activity, in environmentally stable areas.

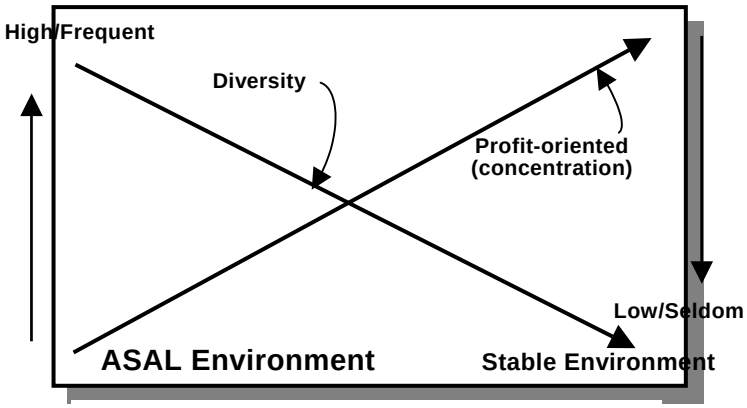


Figure 6.1.2 Diversity vs Environment

Though diversity is their strategy for survival, the community structures are often loose and are geared towards mutual assistance in meeting local needs only rather than being suited to project implementation. This strategy in turn makes opportunistic behaviour their way of living. This kind of behaviour causes difficulties in gathering all the people together and in forming a consensus by giving directions to all the people concerned. To a large extent, this explains the erratic participation that was observed during the large operations for such verification projects as the excavation of the Sandai canal, the construction of the Upper Mukutani water supply system, and the rehabilitation of Pan in Rugus. Also, this type of behaviour may discourage fairness and equitable distribution of the burdens required to be shouldered in any group work. Participants in these operations are often the same people volunteering again and again, rather than everyone taking their turn.

Social cohesiveness structured under such conditions may not be as well developed to meet the need for smooth project operation as planners or GOK officers think. Institutional and organisational intervention may be stressed in developing the social cohesiveness required for smooth project implementation. However, one should keep in mind that diversity, leading to opportunistic behaviour, is the strategy of people who live under harsh environmental conditions, so that flexibility should always be pursued rather than a rigid adherence to the original project plan, the so-called blueprint.

6.1.4 Consideration of Gap between Modern and Rural Livings

One may see a vast gulf between rural life and modern life. Rural life is still very

traditional, especially in the Kiserian and Mukutani locations, while town dwellers, like those in Kabarnet or Nairobi, enjoy modern life although services are often disrupted. The distance between the two kinds of lives may not in itself cause much difficulty in planning, implementing and managing a project. The problem is lack of intermediate techniques connecting traditional rural life and modern life. This can lead to polarisation, something that one may perceive when the one views the country as a whole. This observation applies not only to the life but also the way of thinking of the people.

Planners from a developed country in charge of rural development have to be well aware of the lack of intermediate techniques. The same applies to GOK officers who are themselves living a modern life. For example, even simple farm tools including panga are mostly imported and not produced in this country. Importing can be justified from the viewpoint of comparative advantage; however there is a problem, namely the lack of repair techniques. Jua Kalis (blacksmiths) are few, which is different from the case in Asian developing countries. Without intermediate techniques, it becomes difficult to maintain the sustainability of any projects and it is also not easy to move up to the next step.

Bank accounts form another example. Banks are part of modern life, which is quite far away from rural reality. Whenever a committee is organised and officially registered with the Social Department, the committee is automatically expected to open a bank account irrespective of the size of the committee and the amount of the transactions. A joint account requires three signatories to withdraw money which in turn entails a certain amount of expenditure incurred because of the travel involved. For example, three signatories from Sandai or Arabal locations have to put aside about 1,500ksh to go to Kabarnet, withdraw money and come back, including a meagre lunch allowance.

Considering the fact that even the dip committees in Arabal and Sandai, dealing with relatively large amounts of money in rural areas, had just 30,000Ksh and 22,000Ksh respectively in their bank accounts as of the end of July 2000, it may not be practical for small committees like Rugus Pan committee and Partalo Rain-harvesting group to open a bank account. Instead, these small committee would be better dealing with sums in-kind, an example of which is payment in goats as practised in an irrigation group in Upper Mukutani.

To open a bank account is a good idea and one can be opened with assistance from GOK/JICA during the project implementation period. However, operating the bank account may not be sustainable because of the expense required in making withdrawals, which is much higher than the bank's interest. Another difficulty occurs when they have to change any signatory as a result of elections. Even in a case where only one signatory has to be changed, all the three signatories have to come to the bank with their photos and an endorsement letter from GOK. This signatory change may be very difficult unless they can get some financial support from GOK.

The huge underlying gap between rural society and modern society cannot be underestimated in planning any project in rural areas. The more materials are brought to the community, the rural society, from outside, the modern society, the less sustainable the project becomes. The planner/GOK should be well aware of that kind of huge gap or lack of intermediate technique, or otherwise an idea which sounds good may not function well on the ground.

6.1.5 Institutional Setting-up and Decision-Making

In most institution-building, there are three important decentralised elements: 1) planning and recommendations, 2) decision-making for the plan recommended, and 3) day-to-day execution according to the decision made. In line with this, a typical institutional set-up is schematically shown below:

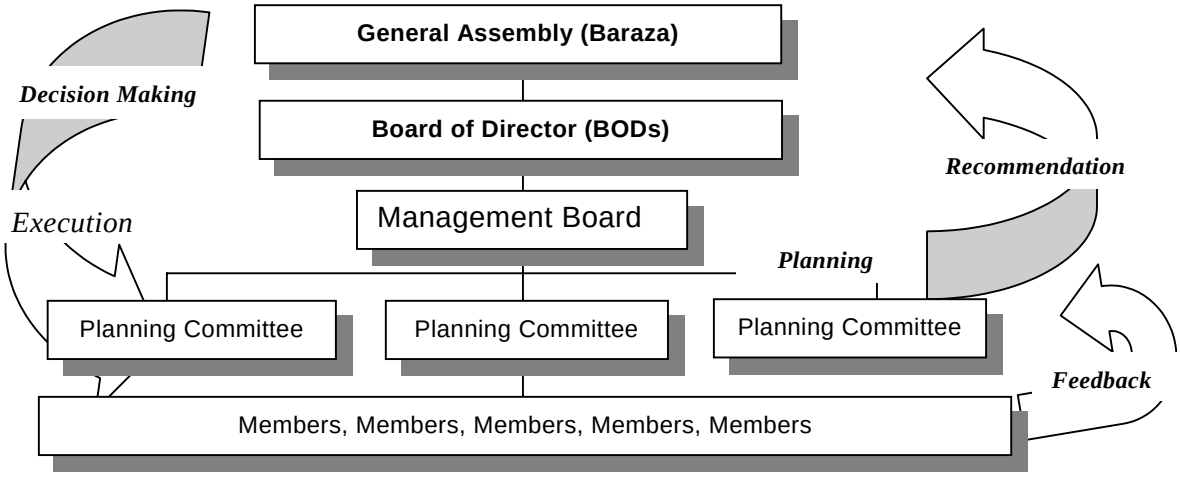


Figure 6.1.3 Decentralized Institutional Setting-up

Any plan is formulated in a planning committee and recommended to the Board of Directors (BODs), which is sometimes called the Management Committee in the communities of the Study Area. The BOD is the decision-making body, and if a plan requires a referendum, a General Assembly (Baraza) has to be convened in which a final decision is made. The Management Board is composed of a chairman, secretary, treasurer, etc., who are in charge of executing the plan according to the decision made, thereby sometimes being called the Executive Committee in the Study Area, and they have to take responsibility for day-to-day management.

The management officers are in most cases members of the BODs. For example, there are 17 BOD committee members in the Sandai Irrigation Association, out of whom three are the Management Board officers, the chairman, secretary, and treasurer. The problem is confusion of the responsibility between the role as chairman of the Management Board and as a member of the BODs. Although the chairman is the Chief Executive Officer, he/she in fact has only one vote over the BOD members in terms of decision-making. When an

issue is so important that it needs a referendum, even the chairman has only one vote over the entire membership.

Another example is Marigat Youth Polytechnic. Members of the management committee, just like the BOD in the above figure, are currently involved in accusations and counter-accusations that are of little help to the progress of the institution. The chairman has pursued various actions without following any procedures. For the last six months, the chairman has been acting on behalf of the Polytechnic without setting foot in the institution. By himself, he would undoubtedly call for meetings, or request replacement of the Polytechnic manager. The authority vested in the chairman in terms of decision-making shall be only one vote over the management memberships.

The decentralised institutional set-up shown in the above figure may not be needed for a relatively primitive group like the Pan Committee in Rugus. Also, that area obviously needs strong leadership, even called jungle fighter style leadership, taking into account the situation it is facing. However, if an organisation is relatively large and deals with a certain amount of cash, that kind of institutional setting-up as well as the demarcation of responsibility have to be clearly established, so that concentration of power can be avoided and decision-making and indeed the whole process can become more democratic and transparent.

6.1.6 Income-generating Activities as a Project Component

Having been faced with a financial crisis, the GOK has had difficulties in providing financial support or sufficient public services to the communities concerned in the Study Area and also over the country in general. It is now directed that the communities should basically go with their capacity and resources; it is being emphasised that, wherever possible, an income-generating activity should be built into their projects to sustain their activities forward.

Improvements in irrigation and livestock, small-scale industry and rainwater harvesting are, to a greater or lesser degree, a means of generating income as has been demonstrated through the verification projects. The benefit from the projects would help them to go forward. Marigat Youth Polytechnic, which has not been supported by the Government but has been operating on a Harambee basis, could be made self-reliant by combining income-generating activities, say selling furniture, with tuition, although its main objective is to give vocational training to the students. Marigat Health Centre may need institutional reform to give more autonomy to the Board to handle the finances and day to day running of the institution.

An improved Jiko is self-sustaining, not requiring any financial support from outside, and the women will have more time to get involved in income-generating activities by its reduction in firewood and time used in cooking. Even for a rehabilitation of pan, the

women would be able to save on the time spent fetching water and may get involved in other income-generating activities e.g. bee-keeping, handicrafts etc. Even the silt from the pan might be utilised e.g. for kitchen gardening or brick-making and so on in the long run. These possibilities should always be considered in planning and designing a project.

6.1.7 Cost-sharing versus Subsidy

A particular policy tried out in the verification projects does not count as part of cost-sharing if the community can manage within its limits. It implies that the contribution of labour does not constitute part of a community's actual contribution, which is quite a different approach from other past and current ongoing projects in Kenya. Neither are local materials such as river sand, stones, acacia hedges, etc. counted. Given some situations in which even participating in a planning workshop is counted as part of a contribution, this approach, trialled in the verification projects, is quite new and may still be difficult to understand.

Cost-sharing may stand on an equal basis or to a lesser extent on a shared basis between the outsider and the beneficiaries in terms of project ownership. Cost-sharing practised during project implementation is well known to continue even after the project completion, requiring another use of sharing during the O&M stage as well. One example is given, the maintenance of a pan. The beneficiaries are supposed to maintain the pan by themselves after project completion; however no such practice has been followed in the country except in a few cases. The pan beneficiaries practise another form of cost-sharing even in pan rehabilitation, which actually represents a type of accumulated deferred maintenance . Thus, it is virtually impossible to sustain the project.

To shift the paradigm, this Study proposes to give the entire project ownership to the beneficiaries, and donors stand on as a subsidy provider. The subsidy is provided for equipment, fabricated materials such as PVC pipework, concrete culverts, etc. and transportation that the communities cannot manage by themselves. The subsidy rate varies from 70 to 90% depending on the communities' living standard and also the nature of the projects (Basic Human Needs (BHN)-related or profit-making). The cost-sharing referred to in this Study, therefore, may rather be defined as being in the nature of a subsidy.

Based on the above discussion, a comparison between conventional projects and the verification projects is shown schematically below. The conventional project approach (see left figure) is that the participation of the community is usually in the form of labour supply and in cases designing, supervising and managing the project. On the other hand, the approach proposed here asks the community, in principle, to manage all the concerns such as material, design, supervision and management and labour. There are cases definitely beyond what the community can manage; those are in most cases materials brought from outside and techniques required for design, supervision and project

management.

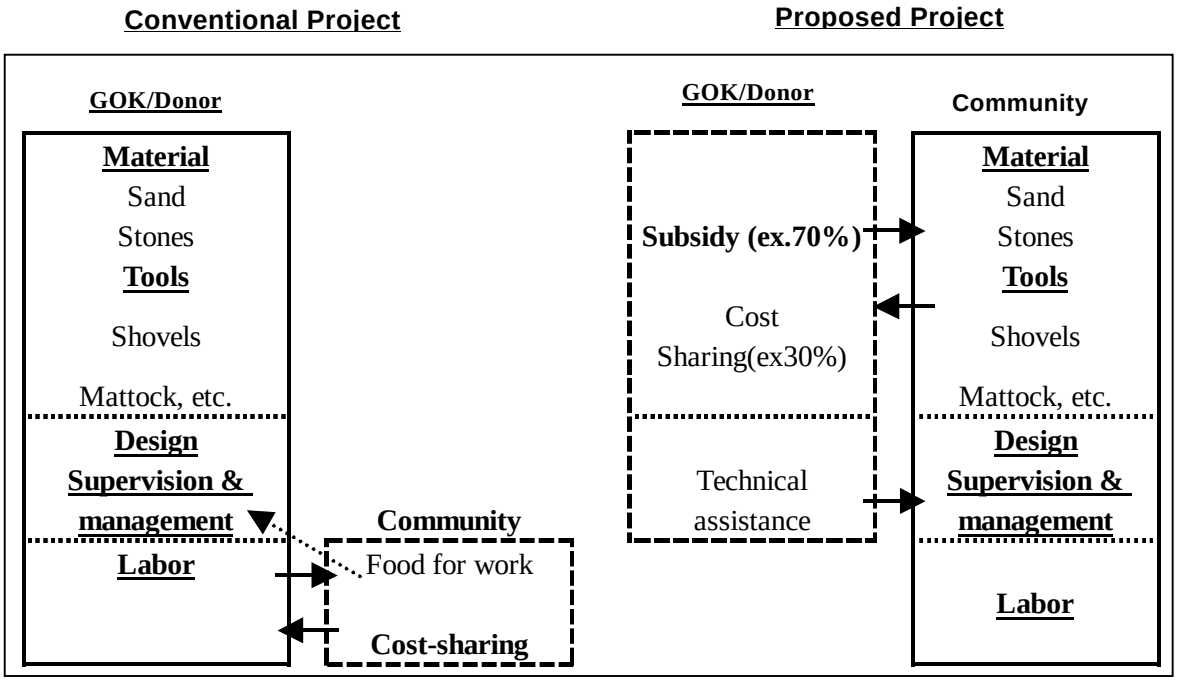


Figure 6.1.4 Cost-sharing vs. Subsidy

6.2 Area-Focused Integrated Development Plan

6.2.1 Area-wise Future Vision

Natural conditions such as topography, rainfall, vegetation and availability of water, and social characteristics such as ethnic groupings, village history and culture vary significantly in the Study Area, although it is rather limited in population and area for the usual type of master plan. This variation was proved to be fairly vital through the implementation of the verification projects. Thus it is difficult to make one model for the Study Area and it is therefore necessary to think about "a different development process" at least for each cluster in formulating a master plan.

Based on the results of the PRA workshops, RRA and PCM workshops in 1999, the Study Team has applied a resource assessment of the carrying capacity of the area. With the lessons from the verification projects, "the future vision" of each cluster is described below (see Figures 6.2.1 & 6.2.2).

1) Cluster E (Kimalel Location)
Rain-fed Agriculture accompany with soil-conservation
Sufficient drinking water (develop further as a home of Koriema goats which are famous nationwide)

2) Cluster A (Marigato Location)
A regional centre of administration, education, health information and treatment, commerce and small-scale industry

3) Cluster C (Salabani Location)
A tourist town beside Lake Baringo with diversified culture

Figure 6.2.1 Location of Clusters

4) Cluster B (Eldume / Ngambo Locations)
Rehabilitation of land, and firewood savings by improved Jiko
Security of income from irrigated agriculture and from livestock

5) Cluster D (Sandai / Loboi / Kapkuikui)
An advanced area of communal irrigation water management

6) Cluster F (Kiserian / Mukutani Locations)
Fulfil BHN such as safe and stable water supply
Harmony of traditional pastoral life and modernisation

7) Cluster G (Arabal Location)
Security of food- rain-fed agriculture and livestock improvement

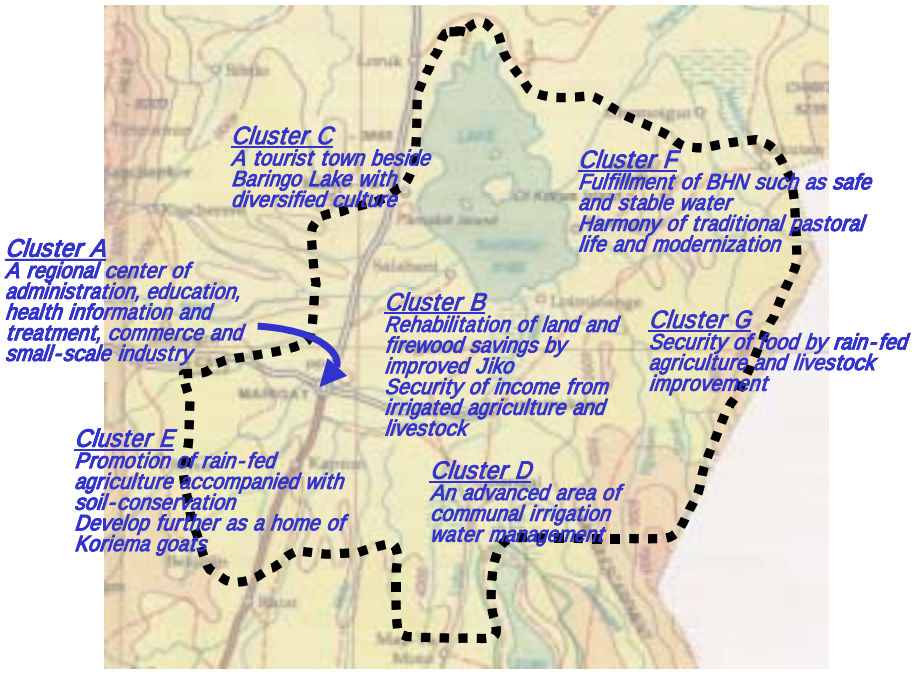


Figure 6.2.2 Area-wise Future Vision

6.2.2 The Approach from the Aspects of Organisation and Norms

Considering the characteristics of the each regional category from the aspect of organisation and norms, we have to examine the approach by each regional category (Figure 6.2.3). Firstly, draw the triangle, of which the top shows the means of livelihood such as livestock, agriculture or commercial (service) sector observed in Salabani and Marigat. Then, place the regional category in the Study Area. The head of triangle angles show the tendency of oriented action to be taken in the case of agriculture, livestock and the commercial sector; that is, it shows the benefit trend for the commercial sector, the cooperation trend for agriculture, and the migration trend for livestock. Then, let us look at the norms opposite the behavioural ones, at the base-line opposite each angle of the triangle. That is, the benefit trend is in the angle opposite the subsistence trend, the cooperation trend is in the angle opposite the individualistic trend, and the migration trend is in the angle opposite the settlement trend. It seems that the subsistence trend is superior for agriculture and livestock, and the individualistic trend is the strongest for livestock. The settlement trend is superior for agriculture and the commercial sector.

In the Study Area, great weight is placed on livestock generally, and the norms of individualistic behaviour are the main subject. In the case of the commercial sector, it is also common to manage on an individual basis at present. Moreover, cooperative behaviour is also observed in the people engaged in agriculture. However, it is not easy to approach the top of the triangle even if the agricultural trend is stronger because of the influence of drought and lack of resources. Based on these situations, the following table states the important aspects of organisation and the norms for development by each region.

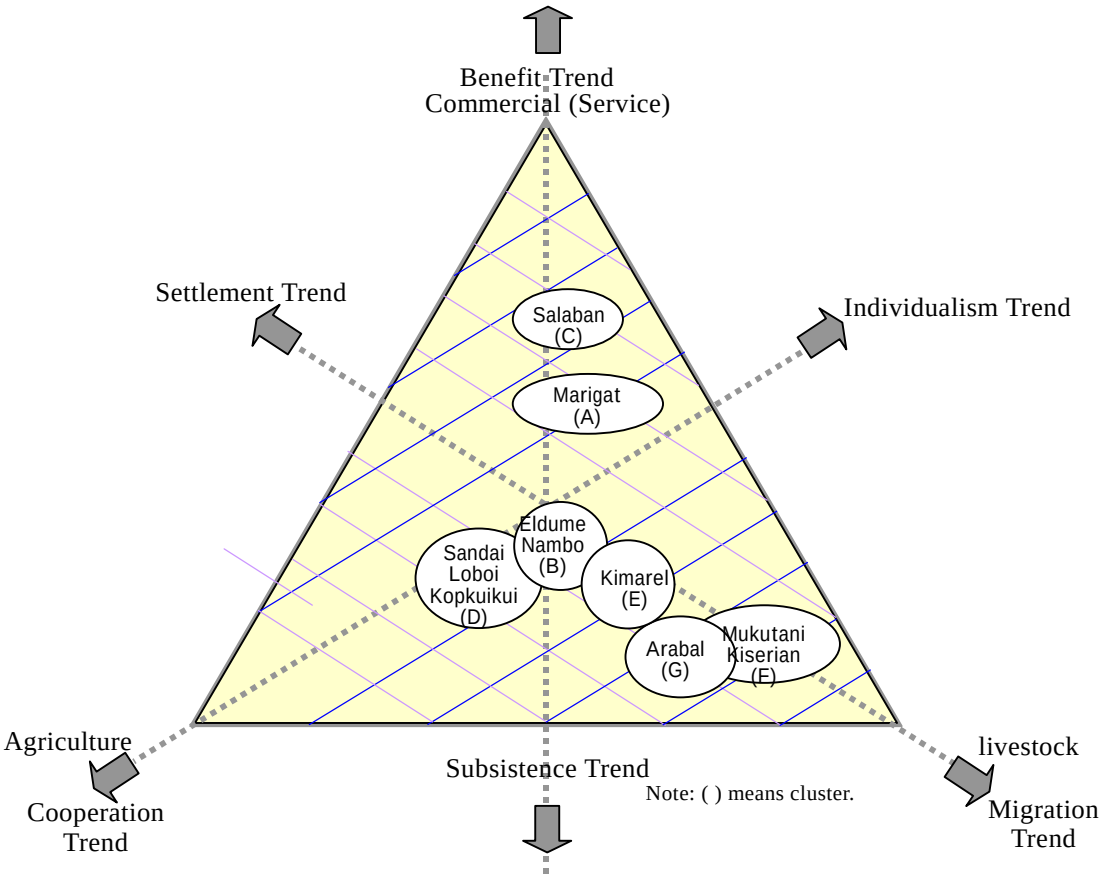


Figure6.2.3 Occupation and the Norms of Behavior

Table 6.2.1 The Approach toward Organisation and the Norms

Cluster/region	Characteristics	Approach
F: Mukutani, Kiserian	Mainly livestock, behaviour based on blood relationship and family	Start from the project programme based on the activities of small-scale groups or individuals, since individualism is superior.
G,E,B	Shifting zone from F to D	Corresponds to shifting zone from F to D
D: Sandai, Loboi, Kapkuikui	Weight is gradually moved toward agriculture, but incentive for cooperative management is relatively low because of unstable resources.	・Introduce technology which allocates the common resources equally, such as establishment of the gate for irrigation. ・There is a difficulty for agriculture, because there is limitation for equal allocation because of large fluctuations and lack of resources. For this reason, vary the relevant charge for maintenance of the facility depending on the scale of the produce benefit. In the case of irrigation, for example, it is possible to contemplate charging for water if there is enough production and if not, exempting people from charges.
A,C Salabani, Marigat	Cluster for commercial or service sector, however individualistic behaviour is mainstream.	Expand the network gradually by providing the space for activities, such as multi-purpose building. It aims to lead to improvement of livelihood for the long term with organisation base.

6.2.3 Area-Focused Master Plan

An area-focused master plan revised after the implementation of the verification projects for the development process to reach the "future vision" of each cluster is shown in Figure 6.2.4.

The box above shows "capacity building" programmes and projects such as those in rural community / rural organisations / gender, the administration system, and human resources development. The box on the left is for "environment and infrastructure" programmes and projects such as those in environment, health and sanitation, and agricultural and rural infrastructure, and the box on the right is for "income-generating activities" such as agriculture, livestock and small-scale industry. These programmes and projects also correspond to the development framework towards the overall goal of "Standard of living of the villagers improves" shown in Figure 6.2.5. The box at the centre contains the priority programmes and projects by cluster and classified as short-, medium- and long-term.

In the boxes for "capacity building", "environment and infrastructure" and "income-generating activities", the programmes and projects shown in bold letters with underline were tried out in the verification projects. The following is a short description of the priority programmes and projects of each cluster. Underlined are the programmes implemented as verification projects.

1) Cluster E (Kimalel Location)
   Extension of Rain-fed Agriculture and rehabilitation of denuded and eroded land.
   Promotion of small-scale industry (honey, and skin and hides marketing), and supply of drinking water.

2) Cluster A (Marigat Location)
   Strengthening of the facilities for the regional centres such as Marigat Health Centre, Marigat Youth Polytechnic and Kenyan Agricultural Research Institute, Regional Research Centre, and electricity service expansion.

3) Cluster C (Salabani Location)
   Promotion of improved Jiko and promotion of small-scale industry (honey, fried fish, handicraft and tourism), rehabilitation of denuded and eroded land, supply of drinking water, and electricity service expansion.

4) Cluster B (Eldume / Ngambo Location)
   Rehabilitation of Land with tree planting and extension of Improved Jiko, promotion of small-scale industry (handicrafts), rehabilitation of denuded and eroded land, and installation of a public telephone at the centre of each location.

5) Cluster D (Sandai / Loboi / Kapkuikui Locations)

Communal irrigation water management, land registration, promotion of modernised livestock feeding, and installation of a public telephone at the centre of each location.

6) Cluster F (Kiserian / Mukutani Locations)
BHN programmes such as rehabilitation of pan dams, rural water supply, support to pre-primary schools, and improvement of rainwater harvesting.

7) Cluster G (Arabal Location)
Improvement of livestock + improvement of rainwater harvesting (Rain-fed Agriculture), promotion of small-scale industry (honey), support to pre-primary schools, rehabilitation of denuded and eroded land, and road condition improvement.

Figure 6.2.4 Area-focused Master Plan

Rural Community Development / Gender	Administration System	Human Resource Development
CD1. Ownership of Master Plan by local community	AS1. Learning from best practices	**HR1. Support to Marigat Youth Polytechnic**
CD2. Strengthening animal dip groups / irrigation groups / input supply associations / co-operative societies / women and youth group for income generating activities / water and soil conservation neighborhood group / community-based health clinic group / community-based animal health association / water pan and self-help rural water supply group	AS2. Training in PRA, RRA and PCM	**HR2. Support to Pre-primary Schools**
CD3. Rehabilitation of marginalized group	AS3. Local awareness building campaign in support of KRDS	**HR3. Non Formal Education**
CD4. Addressing role of women and gender issues (Introduction of improved hand-operated grain milling machines / Gender sensitization plan)	AS4. Strengthening of the Marigat / Mukutani Divisional Office	**HR4. Functional Adult Literacy**
CD5. Capacity building for Rural People (Community awareness creation / Management and leadership training / Trainings for community owned resource persons)	AS5. Perkerra integrated development	**HR5. Improvement of Primary School Facilities and Equipment**
	AS6. Divisional focus for rural development	**HR6. Transformation of Marigat Youth Polytechnic into a Training Institute**

Environment

EV1. Promotion of improved stove (Jiko)
EV2. Conservation of pan's catchment
EV3. Conversion of cattle, traditional savings, into cash savings
EV4. Setting up an individual pasture plot just around homestead
EV5. Rehabilitation of bare and eroded land
EV6. Tree planting

Rural Health and Sanitation Development

HS1. Towards PHC Laboratory
HS2. Epidemiological Investigation Capacity Building
HS3. Communication on Health Matters
HS4. Revitalize BI stations
HS5. Empirical Wisdom Integration
HS6. Database for Burden of Diseases Study
HS7. Continuous Training for Health Staffs
HS8. PHC Research
HS9. Activate Community in Health
HS10. PHC promotion
HS11. Role of sub-district hospital
HS12. Health for All

Agricultural and Rural Infrastructure Development

IF1. Catchment water resource assessment
IF2. Strengthening water authority
IF3. Water management
IF4. Water supply
IF5. Road condition improvement
IF6. Electricity service expansion
IF7. Telephone service expansion

Cluster	E	A	C	B	D	F	G
Location	**Kimalel**	**Marigat**	**Salabani**	**Eldume / Ngambo**	**Sandai/Loboi/Kapkuikui**	**Kiserian / Mukutani**	**Arabal**
Characteristics	Cosmopolitan, Commercial			Swamp, Crop field		Traditional, Pastoral	Livestock, Newly settled
Topography							

SUSTAINABLE LIVELIHOOD

Verification Project	AG2. Rain water harvesting	HS1. Strengthen MHC HR1. Marigat Youth Polytechnic	SS2. Honey, SS4. Handicraft SS5. Fried fish, SS7 Building		AG1. Irrigated agriculture LV1 Animal feeding/disease control, buck scheme	IF4,EV2,EV4. Rehabilitation of Pan/dam	AG2. Rain water harvesting LV1 Animal feeding/disease control, buck scheme
Short-term	AG2. Rain water harvesting	HR2. Support to Pre-primary Schools HR3. Non Formal Education	EV1. Improved jiko		AG1.Water saved irrigated agriculture AG5. Land registration LV3. Auction yard establishment	AG2. Rain water harvesting EV4. Individual pasture plot LV3. Auction yard establishment	AG2. Rain water harvesting EV4. Individual pasture plot LV3. Auction yard establishment
	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities	LV1. Extension services, LV2. Genetic improvement LV4. Veterinary Lab., LV5. Marketing/ processing	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities	LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities	LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities	LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities
	SS1. Promotion of bee-keeping SS4. Handicraft promotion SS6. Skin and hides	SS1. Promotion of bee-keeping SS4. Handicraft promotion SS6. Skin and hides		SS4. Handicraft promotion	SS1. Promotion of bee-keeping SS4. Handicraft promotion SS6. Skin and hides	SS4. Handicraft promotion	SS1. Promotion of bee-keeping SS4. Handicraft promotion SS6. Skin and hides
	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration	HS1. Towards PHC Laboratory HS2. Epidemiological Investigation Capacity Building HS3. Communication on Health Matters HS4. BI stations, HS5. Empirical Wisdom Integration HS6. Database for Burden of Diseases Study	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration EV1. Improved Jiko	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration	HS3. Communication on Health Matters HS4. Revitalize BI stations HS5. Empirical Wisdom Integration
	EV5. Rehabilitation of land EV6. Tree planting	EV1. Improved Jiko EV6. Tree planting	EV5. Rehabilitation of land EV6. Tree planting	EV5. Rehabilitation of land EV6. Tree planting	EV2. Pan's catchment		EV5. Rehabilitation of land EV6. Tree planting
	IF4. Water supply	IF6. Electricity service	IF4. Water supply IF6. Electricity service	IF7. Telephone service	IF7. Telephone service	IF7. Telephone service(SR System)	IF5. Road improvement
Medium-term		HR4. Functional Adult Literacy			AG1.Water saved irrigated agriculture AG3.Pasture development	AG1. Water saved irrigated agriculture AG2. Rain water harvest	AG1. Water save irrigated agiculyure AG7.Rehabilitation of rangeland
	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities EV4. Individual pasture plot	LV4.Veterinary Lab. in MVO LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities	LV3. Auction yard establishment LV4.Veterinary Lab. in MVO (info. system) LV5. Livestock marketing/processing facilities
	HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion	HS7. Continuous Training for Health Staffs HS8. PHC Research HS9. Activate Community in Health HS10. PHC promotion HS11. Role of sub-district hospital	HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion EV4. Individual pasture plot	HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion EV4. Individual pasture plot	EV1. Improved jiko HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion EV4. Individual pasture plot	EV6. Tree planting HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion	HS7. Continuous Training for Health Staffs HS9. Activate Community in Health HS10. PHC promotion
		SS7. Multi-purpose Building SS2. Bottled honey SS3. Bee-wax candle	SS8. Cultural center		SS7. Multi-purpose building SS2. Bottled honey SS3. Bee-wax candle		
	EV1. Improved Jiko EV5. Rehabilitation of land	EV4. Individual pasture plot EV5. Rehabilitation of land			EV5. Rehabilitation of land	EV4. Individual pasture plot Ev5. Rehabilitation of land	EV2. Pan's catchment
		IF2. Water Authority IF3. Water management IF4. Water supply	IF4. Water supply	IF2. Water Authority IF3. Water management	IF2. Water Authority IF3. Water management IF6. Electricity service	IF5. Road improvement	
Long-term	AG2. Rain water harvesting HS12. Health for All	HR5. Improvement of Primary School Facilities and Equipment HR6. Transformation of Marigat Youth Polytechnic into a Training Institute HS12. Health for All	HS12. Health for All EV2. Pan's catchment	HS12. Health for All	AG1.Water saved irrigated agriculture HS12. Health for All	AG1.Water saved irrigated agriculture AG2. Rain water harvesting AG3. Pasture development AG6. Social forestry AG7. Rangeland rehabilitation	AG1.Water save irrigated agiculyure AG2. Rain water harvesting HS12. Health for All
			SS9. Ostrich farm			HS12. Health for All	
	EV2. Pan's catchment					EV1. Improved jiko	EV1. Improved Jiko
	IF1. Catchement water	IF1. Catchement water IF4. Water supply	IF4. Water supply IF5. Road improvement IF6. Electricity service	IF1. Catchment water IF5. Road improvement	IF1. Catchment water	IF6. Electricity service IF7. Telephone service	IF5. Road improvement

Agriculture

AG1. Water saved irrigated agriculture
AG2. Rain water harvesting
AG3. Pasture development with tree planting
AG4. Strengthening KARI-RRC
AG5. Land registration
AG6. Social forestry development
AG7. Rehabilitation of Rangeland

Livestock

LV1. Strengthening extension services.
LV2. Strengthening genetic improvement and up-grading goats breeding station (KARI-RRC Perkerra or Kimose)
LV3. Establishing auction yard in centers of rural towns
LV4. Establishing Veterinary Lab. in Marigat Veterinary Office
LV5. Establishing a livestock marketing system with efficient slaughtering and processing facilities

Small-scale Rural Industry

SS1. Promotion of bee-keeping
SS2. Bottled honey
SS3. Bee-wax candle
SS4. Handicraft promotion
SS5. Fried fish
SS6. Market improvement of skin and hides
SS7. Establishment of multi-purpose building
SS8. Establishment of cultural center
SS9. Establishment of ostrich farm

Underline: Verification projects, **Bold**: Area-focused programs / projects

Figure 6.2.5 Development Framework in the Baringo Semi Arid Land Area (Marigat and Mukutani Divisions)

6.3 Strengthening of Administration Systems for Participatory Rural Development

6.3.1 Understandings

Administration systems, which is a form of social, economic, political organization or practice, is the thread to sew a social, economic and political fabric of the society, and the glue to put the state and local communities together. Unless the administration systems function properly, it is almost impossible to realize rural development and poverty reduction.

At the end of the Phase I Study, i.e., the submission of the Provisional Master Plan, the Study Team established many hypotheses on the ways and means for realizing rural development and poverty reduction in the study area. Among those, the most important for the administration systems were as follows:

1. There is an acute need for introducing true political, fiscal, administrative and market **decentralization**, and the most important of all is the **fiscal decentralization**
2. The best starting point of reform for decentralization is the awareness building, which can best be promoted through **learning from best practices.** The biggest lesson to be learned would be community mobilization and the spirit of self-help.
3. There is a need to adopt both bottom-up and top-down approaches, but currently there is a huge gap between the tips of the two arrows. The best meeting point of these two directions is at the divisional level rather than the district level as advocated in the DFRD or draft KRDS. Thus, there is a need for **"Divisional Focus for Rural Development (Div.FRD)".**

Further, after two years of field work, the Study Team has gained much more understanding on the administration systems in Kenya and the Study area. While the lack of governance is the major cause of Kenya's declining economy during the last quarter century, it is often related to Africa's tribal system. The circle of trust often does not extend beyond the tribal boundary. The criteria or the measure of 'corruption' therefore is not necessarily the same as that of the West or of Japan. It has a lot to do with the long-held African value systems, and it would take a long time to change. In fact, the measure of 'time' in Kenya is also quite different from that of Japan. Consequently, the rural development in Kenya must be carried out patiently taking into account its traditional culture.

How these hypotheses have held up after 18 months of various verification studies? This section presents our accounts more at the micro and local level (rather than the generalization at a macro-level as argued in Chapter II).

1） Need for true decentralization, particularly fiscal decentralization

The need has turned out to be really true through the verification projects. There was **little political decentralization** in the local level. All the concerned officers (DC, DDO, DPO, District Officers, Divisional Officers, Chiefs and Sub-Chiefs) were appointed by the President, or by President-appointed DC. Under the severe budget crisis and resulting retrenchment, more than ever, the minds of those administration staff were on their own survival, and their eyes were essentially on Nairobi.

Under above circumstances, and given the absence of local government civil service, the people in Marigat and Mukutani locations seldom saw district officers visiting them (unless those officers got transport support from projects like this Study), and felt little presence of them. The power of local legislature (county councilors) appeared to be weak in comparison with senior officers in the executive branch. Given the absolute lack of tax collection power, there was little that the Baringo District or Marigat and Mukutani Divisions could do to increase their financial resources on their own (see reference to fiscal decentralization bellow).

As to administrative decentralization, what happened under the District Focus for Rural Development was **deconcentration** or at most **delegation** (of responsibility but not all the needed authority), and **not devolution.** The most crippling cause for slow rural development (and even declining economy) was **the lack of fiscal decentralization**. At all the workshops and seminars conducted under the Study, lack of financial resources was quoted by participants as the biggest obstacle for taking any initiatives. The district officers stationed in Kabarnet saw no operating budget actually coming from their respective national ministries and even their monthly salaries were often late in coming. Yet, the district itself could not raise tax. The situation at the divisional level was even worse.

Faced with the reality of non-existing fiscal decentralization, the local community and the Study Team attempted to devise development projects which would not depend on any outside financial resources but on their own available resources. This, however, turned out to be a tall order, partly because of the long established aid-dependency syndrome of the community, but also the reality that any projects, how small they were, needed some minimum fixed cash costs, which were beyond the community's ability to provide on their own.

As explained in Chapter II, fiscal decentralization can take many forms. Under the verification studies, community's financial participation took various forms such as cash contribution (e.g., Kampi a Samaki multi-purpose building, Sandai intake canal rehabilitation, Upper Mukutani water-pipe, etc., which ranged from 10 to 30 percent of the cash costs) and labor contribution (almost all the verification studies). However, as far as the Study Team could determine, there was no expansion of local revenues through property or sales taxes, nor indirect charges. No authorization was given for municipal or

district/division borrowing with loan guarantees by the central government.

The end result of the lack of fiscal decentralization was the need for JICA to provide 70 to 90 percent of cash costs as subsidies. There were not many chances for sustaining the activities with self-generated financial resources, except for such activities as improved cooking stoves, and rained-fed agriculture. This casts serious doubt about the sustainability of those activities started under the verification studies.

The lack of fiscal decentralization is not limited to the verification studies but a nation-wide phenomenon. Under such circumstances, and already for some time since mid-1990s, some donors started channeling their funds directly to the local communities through NGOs (e.g., SARDEP in the Kerio Valley assisted by the Netherlands bilateral aid through a Dutch NGO). However, while SARDEP was a great success story, its sustainability after the Dutch pull out is now highly uncertain (see "Learning from Best Practices" bellow).

Solving the problem of the lack of fiscal decentralization is far beyond the scope of a mere JICA-assisted study. The Study Team is pleased, however, to note that the draft KRDS is indeed addressing this issue. Nevertheless, realizing fiscal decentralization nation-wide would take some time. In the meantime the local communities such as Marigat and Mukutani must devise some resource mobilization systems of their own. Some new suggestions such as the creation of "O&M Fund" and "Children Education Fund" are given in Chapter VII Project Implementation Arrangement.

As to **market decentralization**, here again, there have been few such decentralization taken place in the Study area. One obvious candidate for privatization is the Perkerra Irrigation Scheme, which has been owned, operated and maintained by the National Irrigation Board (NIB) since 1966. Currently, NIB is in serious financial as well as organizational crisis, and in a sense, this has created a significant opportunity for either privatization or gradual shift towards privatization. More will be discussed later in this chapter.

The workshop on "Decentralization and Community-based Rural Development" held in Kabarnet in November 2000 under the Phase II revealed several other issues related to decentralization. Those issues and possible solutions cited by the workshop participants are summarized bellow:

Table 6.3.1 Issued and Solutions

Issues	Possible Solutions
Lack of **transparency and accountability** at all levels: • At the community level, it was not clear what was the total cost of the verification project, e.g. Sandai irrigation, which resulted the community in hesitating making 30% cost sharing (30% of what?) • True level of contribution by government and communities is not reflected in budget and planning	Involve all stakeholders at the planning and budgeting stage: • In particular, involve community at the workshop not only in activity planning but budget planning • In doing so, all forms of contribution, i.e. land, labor and local materials, should be valued
Lack of **communication** at all levels: • while the communication between JICA Team and Divisional Officers and Location Chiefs seems to be good, often District Officers and particularly Nairobi Officers are not well informed • the communication between Division Officers/Location Chiefs on one hand and Sub Locations and villages on the other is not good	• Due to lack of budget, it is recognized that frequent participation of Nairobi officers in activities being done at the project level is difficult • District Working Group should be convened monthly, and where some transportation happens to be available Nairobi officers should participate • Creation of Village Development Committee should be considered
Capacity building at all levels: • Especially training of Project Management Committee members is lacking, e.g. training of PMC treasurers in fund management • This workshop on decentralization is good but more officers and especially beneficiaries should be trained on the subject	• Learn form SARDEP: they have well established system of project proposal, project approval, budgeting, cash-in cash-out ledger, implementation schedule, monitoring sheet, etc. • Organize more workshop of this kind (decentralization) and include beneficiaries
Unclear **ownership** of land: • Kampi ya Samaki Multi-purpose building	• Get title deed for the building
Sustainability of verification projects: • Financial sustainability • Organizational/institutional sustainability, e.g. weak by-laws and its enforcement • Political sustainability, e.g. political interference that might jeopardize community's majority wish	• Continuation of some form of subsidy by donors • Scale down continuation to the level where the community can maintain with available resources • Capacity building of all stakeholders, but especially key persons in community, e.g. PMC members

The last item, sustainability, was the toughest issue. Even for such modest projects as the verification projects, the participants were unsure if they could be sustained without any outside assistance. The most serious of all was the financial sustainability. The Kampi ya Samaki multi-purpose building, for example, was constructed with 90 percent subsidy by JICA. While that was the initial capital cost, can the community operate and maintain it without any form of donor subsidy? What about Sandai Irrigation Scheme? What about the Livestock Improvement in Arabal and Sandai? What about the Marigat Health Centre? Nobody was sure in the workshop about the extent of the subsidies needed and for how long.

The Study Team's suggestion regarding the subsidy issues is presented in Chapter VI, Section 6.1.7 Cost-sharing and Subsidy, and Chapter VII, Section 7.4 Cost Sharing and Way-forward Investment. Under the prevailing circumstances, some subsidies from GOK and donors will still be needed for some time. After all, SARDEP, for example, took 15 years to come to the present stage with contribution averaging about $ 1.0 million per year from the Government of the Netherlands. In the case of Baringo, however, the Study

Team proposes to give the entire project ownership to the beneficiaries, and GOK/donor to become a subsidy provider of materials and technical assistance (rather than the traditional approach of the project essentially owned by GOK/donor and the community participates).

Lastly, and related again to the question of sustainability, is the form of the local administration systems after the donor left. This is a difficult question, and more is discussed under Hypothesis 2 bellow.

2） Learning from Best Practices

Under the Phase II, the first study took place in March 2000. The invited 20 participants included administration officials from the central government, district and divisional officers, chiefs and sub-chiefs, and community leaders such as village elders and teachers. Although this was a group of elite leaders, a half of the participants had never been outside of Baringo District. The tour took them to the following three projects:

1） Semi Arid Rural Development Program (SARDEP) in the Keiyo District in the Kerio Valley (assisted by the Netherlands government)

2） Sicial Forestry Extension Model Project (SOFEM) in the Kitui District (assisted by JICA)

3） Samburu District Development Project (SDDP) in the Samburu District (assisted by GTZ).

The objective of the Study Tour was to learn from best practices under circumstances similar to Baringo, and apply those to the planning of participatory rural development in Marigat and Mukutani Divisions. The impact of the first tour on the local communities was huge. The participants indicated many lessons learned, among others:

a） community mobilization based on people-centered, bottom-up, participatory approach (especially in SARDEP)

b） transect approach (SARDEP)

c） effective use of demonstration farms and training centers (SOFEM)

d） selection of individual farmers for demonstration (SOFEM)

e） utilization of appropriate technologies such as Enzaro jiko, water harvesting, disease and pest control (SOFEM), and

f） organizational structure to mobilize communities such as Project Management Committee (SARDEP and SDDP).

Upon return to their communities, these influential participants immediately organized barazas (community meetings) and briefed their respective community members on their tour and lessons learned. Most importantly, by discussing their findings, they turned the lessons into the local community’s action plan as they had planned at the wrap-up

workshop at the end of the study tour.

The second study tour for administration staff and community leaders was conducted in May 2000 and this time the level of participants was even higher (more influential including many Chiefs and County Councilors). The impact was also great, if not greater than the first tour. Then, this two study tours were followed by many study tours for other more specialized groups, such as women's group from Kampi ya Samaki to learn about Enzaro jiko and handicrafts, Partalo rainfed farmers to observe water conservation techniques, Marigat Polytechnic teachers and students to see more successful polytechnics, etc. "Seeing is believing" turned out to be most true, and those various study tours proved to be the most useful tool for awareness building and participatory action planning.

For the participants in the first and second Study Tours for administration officials and community leaders, a follow-up workshop was held in November 2001 to review the progress of the follow-up activities in each location using the action plan prepared at the end of each tour as the bench mark. The actual achievements made varied from location to location.

Naturally, those locations chosen to have verification studies achieved a lot more than other locations as they were supposed to. Arabal location, for example, did create five 'transects' (albeit not exactly the same concept as that of SARDEP), elected Project Management Committees (PMCs), set aside land for a demonstration and training center, and organized study tours to suit their own needs.

Some locations not selected for conducting verification studies also made tangible achievements, e.g., improved cooking stove in Eldume (they even improved the design of Enzaro jiko to suit their smaller kitchen). For those locations not selected for conducting verification studies, the 'Inter-location Monitoring and Evaluation' was devised, in which they monitored and evaluated the progress of the verification projects in other locations. This achieved remarkable demonstration effect.

The participants from those locations where relatively little achievements had been made, they sited the reasons to be drought and lack of resources, especially financial resources. Lack of transparency, accountability and political interference were also cited. It was interesting to note that the participants were not entirely clear about the exact role of the government in this process, although they did acknowledge their contribution.

Although all the participants learned a great deal from the study tours, they were indeed concerned about sustainability of what they started. Some suggested that they should start from what they can chew: "When we eat ugali, we first pick up some, make a ball, push the top to make it like a spoon, and scoop soup with it, and then eat. If the ball is too big we cannot swallow it. So we make a ball with a size that we can chew. Likewise, we can

start with self-financing and later, if needed, ask for subsidy", one participant remarked. Notwithstanding the correctness of this statement, many participants felt that, under the present circumstances of financial crisis, some subsidies would be needed for some time if the community wished to make a real difference.

Related to the sustainability issue, one big problem noted by the participants was what would happen after the donor leaves. SARDEP has established an impressive pyramidal structure with hundreds of PMCs at the base and four Transect Area Committees (TACs) to oversea a group of PMCs under their respective charge, and finally another committee for overall coordination of the SARDEP activities at the pinnacle. It has developed participatory methodologies, and priority setting mechanisms such as the Transect Area Action Plan and Implementation Schedule Form.

However, so successful the transect approach that the fragile district and divisional administration system which had existed before the introduction of the transect approach has virtually been absorbed or more likely replaced by the SARDEP structure. Not only the district and divisional officers periodically attend SARDEP meetings but even DC now attends to those. Just consider the difference of disposable budget between the genuine local administration and SARDEP. The outcome was highly understandable. And yet, SARDEP is a Dutch-assisted program through an NGO.

The real question therefore is what would happen after the Dutch assistance terminates. And indeed, it will be terminated in 2002, because the Government of the Netherlands has taken Kenya out of their priority country list. While SARDEP amply demonstrated the way to carry out effective community mobilization, how the further weakened genuine local administration can readily step in and resume effective administration without any assistance? This is the dilemma of a successful donor-assisted community-based project.

In future, all the participants of the Study Tours for the administration staff and community leaders wished to continue the tours, either with the same participants or new participants. They also suggested some new places to visit such as Kajiado, Machakos, Meru (near Isiolo), Makeuni (Israeli-assisted scheme), West Pokot, Rangwe (Kisumu) and Narok.

3） The Need for Divisional Focus for Rural Development (Div.FRD)

Intuitively, the Study Team believes this hypothesis was also proven true as far as the Baringo District was concerned. Although it takes only 45 minutes to go down to Marigat by a private car from Kabarnet, such means of transport is not available to district or divisional officers not to mention most of the ordinary citizens. The matatu, the local private microbus, takes longer and expensive for local standard. For the people living in the far locations such as Arabal or Upper Mukutani, it usually takes a whole day just to come down to Marigat.

Thus, physically, Marigat and Mukutani divisions are very far from Kabarnet. There were only two functioning telephones available in the entire District Secretariat in Kabarnet, one belongs to DC and the other to DDO. Without transport, district officers cannot travel to field. It is often the case that an agricultural extension officer spends 90 percent of his time at his desk at the Kabarnet Headquarters. Under the present circumstances, therefore, it is impossible for the district office to oversee properly development projects in Marigat and Mukutani divisions. Divisional Officers, on the other hand are at least living in the divisions. It makes sense, therefore, to lower the decentralization focus one notch to the divisional level.

As mentioned earlier, for rural development, both top-down and bottom-up approaches are needed (see Section 2.5.1). At the moment in Kenya and particularly in the Baringo District, the two directions do not meet (see figure below). The Study suggests that the two arrows should meet at the divisional level, hence the need for Div.FRD.

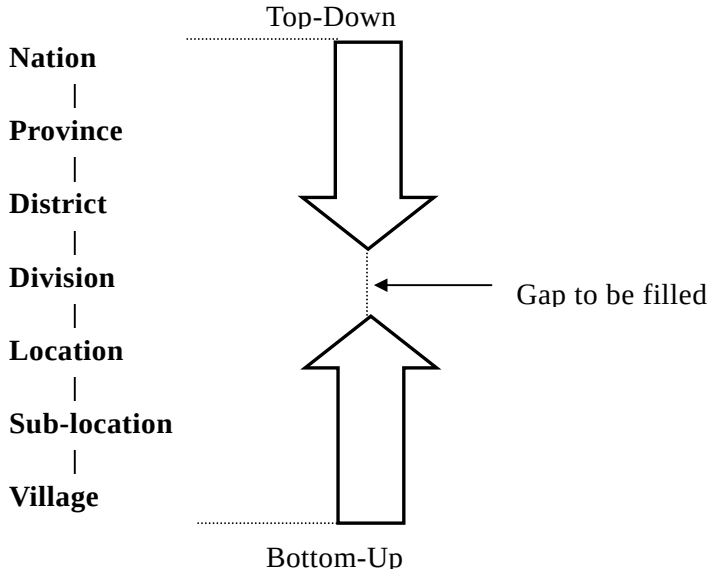


Figure 6.3.1 Top-Down and Bottom- Up

However, the practicability of implementing Div.FRD is unsure. This question is now more serious, given the fact that the draft KRDS did not go far enough to proceed with decentralization down to the divisional level. It appears this suggestion is too difficult to implement politically at this stage. The Study Team, therefore, suggests that under the Master Plan for Marigat and Mukutani, this Div.FRD be carried out as a pilot project.

6.3.2 Capacity Building Program for Participatory Rural Development

After completing the Phase II, and having verified the hypotheses established at the end of the Phase I, the Study Team recommends inclusion in the Master Plan of a Capacity Building Program for participatory rural development, which consists of the following

projects:

1) Learning from Best Practices: continuation of study tours
2) Training on Participatory Planning and Project Management: continuation of training on PRA,RRA, PCM and Project Management
3) Local Awareness Building Campaign in Support of KRDS
4) Strengthening of the Marigat/Mukutani Divisional Office
5) Perkerra Integrated Development.

1) Learning from Best Practices: continuation of study tours

The Capacity Building Program could continue organizing study tours to the SARDEP, SDDP and SOFEM. Study tours could also be organized to other areas such as Kajiado, Machakos, Meru (near Isiolo), Makeuni (Israeli-assisted scheme), West Pokot, Rangwe (Kisumu) and Narok. These study tours could be included in the first 5-year of the Master Plan implementation.

Activities

1. Overall Planning & Logistics
2. Briefings from the relevant administrators/experts on the general scheme
3. Field visits to observe ongoing projects
4. Interviews with Project Management Committees and beneficiaries
5. Hands-on training on how to conduct awareness campaigns, designing of institutional framework, project preparation, approval, funding, monitoring and post evaluation processes
6. Action planning for Baringo

2) Training on Participatory Planning and Project Management

During the course of the Study, the training of counterparts in Participatory Rural Appraisal (PRA) and Project Cycle Management (PCM) already began by involving the counterparts in the actual sessions. The Capacity Building Program would continue and extend such training to other administration staff particularly at the divisional level.

Typically, the administration staff training on PRA and RRA can be organized by the DPO with resource persons (for example, two lecturers) recruited from a local consulting firm (or individual consultants). The duration of the course would be 10 days including a three day of theoretical training and seven days of actual hands-on practice in the field. Such training courses can be conducted periodically, for example, two times a year, but the actual timing should be decided depending on the availability of real opportunities to carry out the hands-on practice.

Regarding PCM, the United Nations Regional Training Center's Nairobi Office periodically offers a training program, which includes PCM, and the administration staff could take advantage of it. The course which is entitled "Africa Training Course on Local and Regional Development", lasts six weeks and is offered two or three times a year in Nairobi (see Appendix E.3 for further details).

The local communities in the Study area are not trained to manage projects on their own and even administration staff need further training. The training program could include a module based on the SARDEP project management model: SARDEP has a well established system of project proposal, project approval, budgeting, cash-in cash-out ledger, implementation schedule, monitoring sheet, etc.

Activities

PRA/RRA Training:

Overall Planning & Logistics

Theoretical Training (3 days)
Hands-on Practice in Field (7 days)

PCM Training:

Overall Planning & Logistics
Training Delivery

Project Management Training:

Overall Planning & Loristics
Module Preparation
Training delivery

3) Local Awareness Building Campaign for Participatory Rural development in support of KRDS

The draft KRDS includes in its mission statement "creation of an enabling environment for private sector led growth and empowering rural people and their institutions in planning and implementation of development initiatives". One of its objectives is to "promote stakeholder participation in the identification, planning, implementation and maintenance of development initiatives". On capacity building, the draft KRDS also mentions "the primary importance of the development of the village level committees and their linkage to the local government structure which would act as the local authority for regional planning, sourcing of external resources and a channel for the flow of the same".[1] These strategies would not work without an effective awareness campaign for the civil service and also the local community.

[1] Government of Kenya, "Kenya Rural Development Strategy – 2001-2016 (draft)", July 2001.

For a long time, the general public of Kenya has been used to the idea of the public sector providing everything. It is necessary therefore to raise awareness not only among the civil service but also the general public about the need for sharing responsibility in development planning and implementation. It is useful to have a clear prototype of such a participatory process. That is why the Study Team is recommending learning from best practices.

The next step would be a Baringo District-wide campaign to raise awareness among the local communities. This campaign could be done also to support the KRDS. It could be a joint effort between the district/division level administration staff and support groups such as NGOs and international/local consults. One of the best ways to carry out such a campaign would be through road-shows. The effectiveness of the road-shows has been proven during the Phase II by the Marigat Health Center verification study.

Under this study, the center staff and the Study Team visited each location and presented a slide show consisting of the pictures of the local residence taken earlier on the day as well as the educational slides prepared by the center. This attracted many audience and they were glued to the screen till the end of the program. Under the awareness campaign project, the road-show team could also consist of local administration staff, other support group staff and entertainers (musicians, dancers, comedians, drama groups, etc). Given the level of literacy and general sophistication of the local communities, each show should be highly entertaining but designed to give a simple and clear message. Such messages might consist of:

- Development is for the local people, by the local people and of the local people. It is important that the local people participate in the development from the planning stage to the project completion.
- The local people should try to help themselves as much as possible by carrying out development programs on a cost-sharing and cost-recovery basis. Although such programs may be more modest than what the local people might wish to be, there will be a better chance to sustain.
- The role of state is changing from a provider of all the goods and services to a provider of technical services, security, regulatory functions and facilitation.

More importantly, the local communities might be encouraged to act out (through skits) their own problems in front of the audience. The campaign might also include brochures, posters, and videos essentially consisting of pictures and drawings, again conveying simple and clear messages.

The activities to be carried out during the first five years are summarized below:

Activities

Overall Planning & Coordination
Road-shows:
- Kimalel
- Salabani
- Marigat
- Eldume
- Mgambo
- Sandai
- Loboi
- Kapkuikui
- Mukutani
- Kiserian
- Arabal

4） Divisional Focus for Rural Development

The guiding principle of Kenya's rural development is going to be the KRDS. Among the reforms that must be carried out is political, administrative, fiscal and market decentralization. While the draft KRDS still recommends the rural development to be focused on the district, our Study recommends that, in Baringo, the level of focus go down one notch to the divisional level.

This downward move, however, requires more careful planning and thorough preparation. The Baringo District could volunteer to be a test site in trying out this new focus. To start with, some initial capital costs would be required to better equip the Marigat/Mukutani Divisional Office. This requires investments in housing, office, office equipment, and transport as well as initial operating budget.

Activities

- Preparation of a Policy Paper on lowering the rural development focus from district to division
- Workshops to discuss the Policy Paper
- Strengthening of the divisional offices:
- Transport support
- Communication support
- Housing support
- Operating budget

5） Perkerra Integrated Development

The ultimate objective of the proposed project is to transform the Perkerra Irrigation Scheme (PIS) command area, the only area in Marigat/Mukutani Divisions where a reasonable amount of water is available, into an integrated livestock-based production center aiming at markets in Nakuru, Nairobi and eventually abroad in the coming 20 years.

The Perkerra Irrigation Scheme (PIS) is located in the middle of the Marigat Division and is the largest of the few irrigation schemes operating in the Study area. The PIS, therefore, cannot be ignored in considering a Master Plan for the Study Area. The construction of PIS started in 1954 after several feasibility studies showed that the Njemps flats were suitable for irrigation. The scheme was constructed by the government and became operational in 1956.

Currently about 1,500 acre are being cultivated through irrigation although the scheme was designed to command 5,000 acre. The irrigation water is drawn from the Perkerra River by gravity and is fed through a system of canals and feeders, none of which are lined. Although the Perkerra River is perennial, the water flow has never been sufficient to irrigate to the full potential of 5,000 ac. The Scheme has 477 farmers each having three or four ac of farmland and 0.5 ac in the village for a homestead. There are five villages inside the command area. The National Irrigation Board (NIB), which was established by an Act of Parliament in 1966, took over the running of the scheme in the same year and has been managing it ever since.

Except onions, the prices of the produce are known before production: NIB negotiates prices with the buyers and announces them to farmers. Farmers receive water, basic seeds, fertilizers and pesticides from NIB, and grow the crops and give them to NIB after the harvest. NIB sells the produce to the buyers at the agreed prices, receives money from the buyers and then pays the farmers after deducting NIB expenses. The exception to this pattern is onions for which NIB offers its venue to the farmers to negotiate directly with buyers. Thus, NIB manages not only the irrigation but also all aspects of input provision and marketing, which are not the stronghold or the real business of NIB. Further, there is no farmer participation in the management of the scheme, hence no sense of ownership. In fact most of the farmers there are either traditional tenants or Turkana refugees seeking temporary manual jobs. Thus, PIS is far from realizing its full potential.

Currently, NIB is in deep crisis. The reform of NIB (including the option to privatize) is an immediate issue, which GOK should consider. According to the mandate stipulated in the Irrigation Act of 1966, NIB is obliged to provide not only the irrigation services but also agricultural input, extension and marketing services to the farmers. In turn, as a general rule, the farmers (tenants) in NIB schemes must cultivate crops NIB decides and sell their produce only to NIB at prices set by NIB. This has often resulted in farmers selling their produce at far below the market price.

In 1998, the farmers in the Mwea scheme, the largest of all the NIB schemes, took over the irrigation facilities by force and have since been running the scheme on their own. Take over of the Mwea scheme by the farmers sent a shock wave to the Government and MOARD dismissed the entire Board. Because of the Mwea scheme not repaying their debt to NIB, NIB itself is now facing the danger of insolvency. For the last three years, the functions of NIB on the Mwea scheme, which accounted for about 80 percent of NIB total area cropped, have been taken over by the Mwea Multipurpose Cooperative Society. Partly due to the inexperience of the farmers to operate and maintain the facilities, and due partly to splitting of the farmers into opposing groups, the facilities are in disrepair and fast deteriorating.

The MOARD and the NIB, however, have shown commitment to solve the Mwea issue and restructure the organization basically focusing its functions to only those tasks directly related to provision of irrigation services, and functions concerning policy, regulation, research and technical assistance. This direction coincides with the general direction of decentralization being advocated in this Study. While Perkerra is relatively a minor part of the NIB operation, it is the biggest scheme existing in the Study area. Combined with the general effort of the local communities envisaged in the Master Plan, there seems to be a scope to use this scheme as a pilot project of public sector/private sector partnership.

The institutional reform of the PIS could start with introducing Participatory Irrigation Management (PIM)2. PIM is now a worldwide movement. More and more public sector managed irrigation systems are being transferred to water user associations (WUAs) despite initial reluctance from the government irrigation agencies. When the Study Team brought up the subject with NIB management, they enthusiastically supported the idea, particularly given the recent incident in the Mwea Irrigation Scheme. A major challenge for PIS in transferring the O&M of irrigation management to WUA(s) is the lack of awareness of such opportunities by the farmers and even a sense of apathy existing among them.

The major cause of such disinterest is the lack of ownership of the land by the farmers. No farmers are really interested in improving their land if there is no guarantee that it belongs to them for a reasonably long time. The issuance of title deeds is therefore a key issue. If the title transfer is not feasible, it is necessary to give farmers at least a long-term lease. In the Mwea Irrigation Scheme, NIB has given the farmers a 45-year lease and this is an encouraging precedence for PIS. The proposed project, therefore, would make it a condition that NIB would first give the farmers a 45-year lease.

[2] The origin of **Participatory Irrigation Management (PIM)** dates back to Mexico in the mid-1980s. When the country was hit by the debt crisis, the Government of Mexico, by necessity, announced it would transfer the responsibility of operating and maintaining nearly 3.2 million ha irrigation facilities, from the public sector to water user associations (WUAs). The government successfully transferred 75 percent of the irrigation districts to WUAs between 1988 to 1992. During this period, however, the government prepared a legal foundation for the transfer and provided meticulous technical assistance to farmers to organize WUAs. The end result was a true sense of ownership by the farmers, greatly increased cost recovery by farmers themselves (also a corresponding reduction in government expenditure), and a degree of reduced water losses and increased yields.

A study must be conducted first to establish the feasibility of the Integrated Perkerra Development Project, in that a participatory planning must be carried out with the local community. As argued in Section 6.2, From Result-Oriented Approach to Process-Oriented Approach, blue printing the entire project might not be possible nor desirable. However, some economic and technical feasibility must first be established on a preliminary basis. One scenario of the Perkerra Integrated Development Project could be to first give farmers a 45-year lease of the land.

The project would then provide technical assistance to the farmers, as well as to local administration, to establish WUA(s), introducing better water management, shifting the cropping pattern to fodder production (by replacing water-consuming maize with sorghum and Napiergrass, which consume less water), developing zero grazing, constructing a milk processing plant[3], strengthening marketing channels, and eventually constructing a slaughter house and expanding the business into tannery and animal skin processing and handicraft industries.

The project activities envisaged under the above scenario are summarized below:

Activities

- feasibility study with participation of the local community in planning
- 45-year lease to the farmers
- Establishment of WUA(s)
- Strengthening of WUA(s)
- Rehabilitation & improvement of irrigation facilities
- Maintenance & rehabilitation of feeder roads and other rural facilities
- Participation in INPIM activities[4]
- Support for credit access
- Fodder production
- Zero grazing livestock production
- Construction of a milk processing plant
- Development of marketing channels
- Construction of a slaughter house
- Construction of animal skin processing
- Promotion of skin-based small-scale industry
- Strengthening of marketing channels
- Export promotion

[3] In Kenya, milking cows are kept mostly in highlands. The Study area might be too low and too hot for such cows and it might be desirable to import some Egyptian species more suitable to the hot climate.
[4] International Network on Participatory Irrigation Management (IMPIM): a Washington based international NGO which aims to promote PIM.

6.4 Rural Community Development

6.4.1 Understanding

In the course of the field survey, the three main problems facing the rural community were identified as:

- Insufficient food security
- Inadequate, unreliable or unsuitable water supply for human and livestock consumption
- Insufficient health services

These problems are not new, and between 1980 and 1995 a number of donor supported projects were implemented with the aim of addressing them. However, a review of relevant literature, as well as discussion with government officers and community members, indicated that these projects did not perform as expected. The main reason for this disappointing performance was the top-down approach adopted in planning and implementation as well as a lack of meaningful involvement from the target community. At the end of project implementation, there were no adequate community-based organizations for continuing with the operation and maintenance of installed project facilities. Hence, soon after the flow of donor resources ended, the performance of projects quickly declined.

Commenting on the fate of a pan implemented by the BSAAP Project in Upper Mukutani, a member of the community stated thus: " the donor hastily withdrew without handing the project to us and so nobody took care of it." From this statement, it may be concluded that all along the local community regarded the pan as belonging to the donor until the time it was "handed over" to them.

Drawing on the lessons of past project implementation, the main concern of the "Master Plan" is not to hand over projects after their completion. Rather, the main thrust should be to hand over the project to the community from the very beginning.

The attitude of the community within the Study Area has been greatly influenced by past development approaches as demonstrated by the initial responses of community members during PRA and PCM workshops. At the early stages of the workshop sessions, participants were inclined to mention a shopping list of projects they wished to be implemented for them. The methodology of PRA and PCM, however, minimised this tendency since the community was required to drive the entire planning process. If they assigned a priority to a project, it was because they felt confident they could implement it either on their own or in partnership with external partners. This is perhaps the first time the local community has been requested to take responsibility for determining the outcome of their future. Rural community development plans aim at reducing the community's over-dependence on external initiatives for what it can do by itself. Indeed in Ndabul,

one of the PRA sites, the dependence syndrome was identified among the five problems facing the community.

A Rural community Development Plan therefore aims at achieving the following desirable situation:

- The community has a better appreciation of its potential and local resources, as well as knowledge of prospective partners with whom beneficial links can be formed.
- The community has gained a deeper understanding of its common vision, objectives, rights and obligations
- The community has achieved group cohesion and the commitment necessary for collective action in contributing effort, time and physical resources for the common good

The above desirable situation is applicable whether one is discussing a whole community or sections of the community. The plans that follow, therefore, attempt to show the processes through which a local community or parts of it (groups, associations, co-operatives etc) can be empowered to pursue and achieve the above stated desirable situation.

6.4.2 Rural Community Development Plan

1） Plan for Community Ownership of the Master Plan

The Study Team has compiled a “Master Plan” with considerable contribution from the community. Since the Plan’s implementation is largely a community responsibility, it is important for the community to appreciate and own the Master Plan particularly those components that are relevant or specific to the local situation.

The “Plan for Community Ownership of the Master Plan” is therefore aimed at:

- Facilitating the community’s understanding of the contents of the Master Plan (resources, potential, future scenarios)
- Clarifying roles to be played by the community as well as supporting organizations in realizing a desirable future condition
- Deepening the community’s commitment to sharing the cost of implementing various Master Plan components

The Study Team and the Department of Rural Development (DRD), in the MOARD, will be responsible for facilitating the ownership of the “Master Plan” in collaboration with the Department of Social Services (DSS). The handing over will be initiated towards the end of the verification period and is expected to cover all the eleven Location Development Committees (LDCs) of the Study Area, with each location taking an estimated three days. A summary of the plan’s main activities is given in Table 6.4.1.

Table 6.4.1 Plan for Ownership of Master Plan by Local Community

Activity	Sharing of Responsibility	
	Community	Relevant Supporting Agencies
1. Prepare summary of Master Plan	-	DRD (District & Division Level); DSS (Division Level); Other Relevant Government Agencies (Division Level); - Summarize aspects of the Master Plan that are relevant to the local community at location level
2. Hold three day "Master Plan Handing-Over Workshops" with respective Location Development Committees (LDCs)	- Chief convenes meeting of location's Development Committee (LDC) and other opinion leaders - Committee discusses the summary report and its implications to the LDC plans and formally receives the master plan	DRD (District & Division Level); DSS (Division Level); Other Relevant Government Agencies (Division Level); - Facilitate meeting and present highlights of the Master Plan - Formally hand over summary of the master plan to LDC
3. Incorporate Master Plan components into the existing Location Development Plan	- LDC members examine relevant components of the Master Plan in relation to current Location Plan - Members discuss and agree on priorities for updating existing location plan	DRD (District & Division Level); DSS (Division Level); Other Relevant Government Agencies (Division Level); - Facilitate discussion of the LDC
4. Prepare format for participatory monitoring and evaluation (PME)	- Members deliberate on how they will monitor their Plan's progress	-do-
5. Communicate main contents of Master Plan to the grass-roots	- Chief calls field baraza - LDC members explain contents and implications of relevant Plan components to the village community (Water supply, animal dips, soil and water conservation, irrigation water management, health & sanitation etc)	MOARD; other Government Agencies (divisional level) - Offers advice as necessary

2） Plan for Farmers Organizations

Community organization and group action have deep traditional roots within the Study Area as illustrated by:

- Traditional ceremonies which often required pooling of resources from kinship, lineage or clan members
- Livestock raiding expeditions which demanded detailed planning and co-ordination
- Installation of indigenous irrigation activities (in the 1890s and 1930s) which required a certain level of localized community organization and mobilization

However, the operational scope of this traditional organization was limited in both time (a few days or weeks) and space (the neighbourhood, village or next community). Since there was no need for sustained effort over time, the organization pattern did not have a well-defined structure and process. Hence once an objective was agreed, a team was quickly formed to carry out the necessary activities. The Next time round, a new functional team had to be re-assembled with or without the same members. Thus neither the team members nor its management were permanently focussed on the organization objectives (initiation rites, cattle rustling etc).

The new farmers' organizations (associations, women groups, youth groups etc) differ from

traditional organizational patterns in that they must remain focussed in order to achieve their objectives. For this reason, they have a standardized organization and management structure consisting of ordinary members, a management committee of 9-15 members and four office bearers i.e. a chairman, vice chairman, secretary and treasurer. Unfortunately, all too often, these farmers' organizations are operated on the same lines as the traditional organizations, on an ad hoc basis where focus on objectives is not permanent.

The three fundamental problems facing farmers' organizations may be summarized as follows:

- An inability to make the transition from traditional social organizational norms to the new set of behaviour patterns demanded by the new organizations (business skills, long term planning, external relations etc)
- Weak internal group dynamics where organizational performance is excessively dependent on the quality of leadership rather than the active participation of the group members
- Self-centred behaviour among members (including committee members) at the expense of group interests thus weakening cohesive forces that draw the group together

Among other things, the verification projects were intended to throw some light on how these fundamental problems affected project performance. In this connection, the performance of the eight community-based projects, against the three fundamental problems, is assessed as summarized in table 6.4.2.

Table 6.4.2 Assessment of Verification Projects against Three Fundamental Problems

Verification Project	Type of Fundamental Problem		
	Inability to transit from traditional to modern Organization norms	Over-dependence on a leader and weak internal dynamics	Self- centred behaviour of group leaders
1. Small-scale Project at Kampi ya Samaki	***	**	
2. Participatory Irrigation (Sandai)	*****	****	*****
3. Water saved Project (Sandai)	***	*	*
4. Livestock Improvement (Sandai)	****	*	*
5. Livestock Improvement (Arabal)	*	**	*
6. Rain Fed Agriculture (Partalo, Arabal)	**	*	
7. Rainfed Agriculture (Kapkun)	*		
8. Rural Water Supply (Upper Mukutani)	*****	****	*

Note:
***** = Problem very severe
**** = Problem severe
*** = Problem modest
** = Problem minimal
* = Problem hardly exists

Key Lessons Learnt

Arising from the verification projects, the following key lessons were drawn:

(a) A deeper appreciation of the community situation is necessary in order to facilitate evolution of organization norms that encourage positive project performance. This may require more time than is usually allocated to project planning.
(b) Social preparation should precede formal project planning by at least 6 months so as to allow the community to internalise the project's organization and management requirements.
(c) Project design should be the result of detailed negotiation between project promoters (GOK, Donors, NGOs) and beneficiaries, where procedures and respective obligations are clearly understood.

The plan for strengthening farmers' organizations consists in defining fairly simple processes (step-wise activities) that improve organization formation and internal management and enable the members to have a shared experience, a common vision as well as developing a sense of mutual responsibility towards each other. More specifically, plan activities should assist members in gaining a clear understanding of their rights as well as obligations. The plan should also lead to better appreciatiation of the role of the leadership they elect, including its performance standards, and in acquiring the courage to use social as well as legal sanctions against members (including the management committee) who subvert the collective interest of the group

The plan consists of sub-plans that are specific to different organizations involved in the major aspects of rural community life, as shown in Tables 6.4.3 to Table 6.4.12.

Table 6.4.3 Plan for Strengthening Animal Dip Groups

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review existing local dip problems and the way forward in a special general meeting	- Dip committee to inform all existing and potential members about date and venue of meeting.	DSS& MOARD (Division Level); - Facilitate meeting and offer technical advice
2. Elect management Committee	- Members agree on what needs to be done and elect a representative management committee that will do this.	DSS& MOARD (Division Level); -Facilitate elections
3. Prepare 3 year dip rehabilitation and operation plan	- Members inspect dip components (crash, pond, outlet, roof, water storage tank etc) and identify repair and maintenance requirements. - Management committee estimates cost of operation & maintenance, other possible services such as castrating, branding and notching and makes a 3-year plan as well as PEM procedures	DSS& MOARD (Division Level); - Facilitate meeting and offer technical advice
4. Prepare current year's budget	- For the current year, management committee compiles cost of repairs, chemicals, water, castrator, branding & notching tools, dip attendants etc as well estimates anticipated dipping and other services revenue	-do-
5. Routine dip operation and management	- Management committee supervises repair and maintenance work as well as weekly dipping operations and associated cash flow	DSS&MOARD (Division Level); - Technical support and training

6. Annual review of past year's dip performance and approval of next year's budget	- Management committee convenes members' meeting and outlines how the dip performed during the previous year (number of animals dipped, revenue collected and cost of materials and overheads)	Facilitate meeting and offer technical advice DSS&MOARD (Division Level);

Table 6.4.4 Plan for Strengthening Irrigation Groups

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Assess present irrigation condition in a special general meeting	- Group leader convenes special general meeting - Members conduct an inspection walk of irrigation system and note condition	MOARD & DSS, Division level; - Facilitate meeting and offer technical advice
2. Review or prepare group by-laws	- Members discuss the need for reviewing existing by-laws or making new ones including: change of group name to correctly reflect group's objectives, registration status, irrigation permit, water rights etc	-do-
3. Prepare general Rehabilitation plan	- Members agree on repair requirements and formulate a three-year rehabilitation plan including monitoring &evaluation procedures	-do-
4. Elect management committee	- Members discuss leadership requirements and associated functions - Members t elect a management committee (including women) best suited to co-ordinate rehabilitation and O&M activities	-do-
5. Compile current year's budget (rehabilitation, operation & maintenance)	- Management committee prepares annual rehabilitation, operation and maintenance programme and implied budgetary requirements - Committee defines and allocates responsibilities among themselves, group leaders and to employed persons	MOARD & DSS, Division level; - Offer technical support, supervision and training
6. Co-ordinate rehabilitation works	- Committee co-ordinates and supervises rehabilitation works	-do-
7. Routine irrigation operation and maintenance	- Committee co-ordinates water distribution, general system maintenance, collection of water charges and enforcement of irrigation by-laws	-do-
8. Annual review of irrigation performance and budget approval	- Committee calls general meeting - Members review past year's irrigation performance and suggest improvements	-do-

Table 6.4.5 Plan for Strengthening Input Supply Associations

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Evaluate last year's operational and financial performance of the Association in a special general meeting	- Management committee convenes special general meeting and prepares necessary data and information on association's performance - Members discuss association performance in terms of availability of inputs to members as well as general financial results	MOARD & DSS (Division level); - Facilitate meeting and offer Technical advice
2. Elect Management Committee	- Members deliberate on qualities necessary for leading a commercially oriented association (buying and selling inputs) - Members elect management committee on merit and in relation to expected roles in the management committee	-do-
3. Review or prepare Group/Association on by-laws	- Members discuss the name of the association in relation to its objectives and agree on an appropriate name as necessary - Members change other aspects of by-laws to reflect its registration standing, bank account and internal management procedures	-do-
4. Pepare current year's operation plan and	- Management committee identifies types of in-put required (seed, fertilisers, other chemicals etc),	MOARD & DSS (Division level);

budget	crop marketing needs - Management committee conducts a surveys aimed at estimating demand for inputs and market for agricultural produce - Committee estimates cost of undertaking input procurement and produce marketing - Management committee sets performance targets and defines PEM procedures	- Offers technical advice and training
5. Routine operation & management	- Management committee co-ordinates and supervises overall operations and allocates tasks to its members and any employed persons	-do-
6. Annual review of Association performance and budget approval	- Management committee calls annual general meeting for discussing past year's performance and approve next year's budget	MORD&DSS (Division level) - Facilitates meeting and offers Technical advice

Table 6.4.6 Plan for Strengthening Co-operative Societies

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Evaluate operational and financial status of the Co-operative society	- Management Committee calls a special general meeting at the Co-operative premises - Members review Society's performance in terms of turnover, dividend pay-outs, availability and quality of other services to members	Department of Co-op. Development (District level); MOARD & DSS (Division level); - Facilitates meeting and offers technical advice
2. Elect Management Committee	- Members deliberate on leadership qualities necessary to guide the society so as to provide improved services to members while maintaining a sound financial position - Members in particular discuss the need to have literacy and business skills as well absolute honesty - Members then elect a new management committee	-do-
3. Review or preparation of co-operative by-laws as necessary	- Members examine existing co-operative operations and assess them against original organization objectives - Members decide which activities to do away with and what activities to introduce as appropriate - Members change by-laws to reflect agreed revised operational strategy	Department of Co-op (District level); MOARD & DSS (Division level); JICA - Provide technical advice and training
4. Pepare or review operation plan and current year's budget	- Management committee up-dates operational plan and targets for the next 3 years , identifies current years' activities and compiles implied operational costs and revenue - In particular, the plan focuses on strategy for increasing capital base, reducing operational costs and increasing revenue as well as defining PME procedures	-do-
5. Routine operation & management	- Management committee co-ordinates and supervises work of employees through monthly meetings	-do-
6. Review of society's performance and approval of next year's budget in annual general meeting	- Management committee submits statement of past year's operations and annual accounts as well as next year's budget proposals for approval by the members	Department of Co-op (District level); MOARD & DSS (Division level); - Facilitates meeting and offers Technical advice

Table 6.4.7 Plan for Strengthening Women and Youth Group for Income Generating Activities (bee-keeping, making handicrafts and fish processing etc)

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Assess operational, financial and legal status of the group in special general meeting	- The leader of the group or management committee calls Special General Meeting of members or prospective members - Members discuss group's performance over the past and current year and suggest need and specific areas for improvement	DSS & DRD (Division level); - Facilitates meeting and offer Technical advice
2. Elect Management Committee	- Members discuss what kind of leadership the group needs in order to operate as a business concern and particular necessary skills for office bearers - Members then elect a management committee on the basis of their specific skills, qualifications and perceived level of honesty	-do-
3. Prepare or review of Group's by-laws as necessary	- Members examine the need for amending group's by-laws in relation to registration status, bank account and specified activities.	- Provides technical advice DSS & MOARD (Division level);
4. Prepare or review current years' operation plan and budget	- Management committee defines procedures for procuring raw materials, production/processing, packaging and marketing final products - Management committee specifies, and discusses with members, quality standards quality control procedures - Management committee procures design expertise for packaging materials, marketing contracts etc) - Management committee identifies operational costs and projected revenue and prepares current year's operational and capital budget	- Provides technical Support and Training DSS & MOARD (Division level);
5. Routine operation & management	- Management committee co-ordinates and supervises the group's operational activities including entering into contracts with third parties	-do-
6. Review of group's performance and approval of next year's budget in annual general meeting	- Members discuss past years' performance and proposed budget and highlight areas requiring improvement	DSS & MOARD (Division level); Technical advice - Facilitates meeting and offers technical advice

Table 6.4.8 Plan for Strengthening Water and Soil Conservation Neighbourhood Group

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review current vegetation cover and land degradation in the neighbourhood	- A key person respected in the community convenes a group general meeting of 20-30 people sharing same neighbourhood - Group discusses land degradation problems in the neighbourhood and possible solutions for individual household and group action	MOARD & DSS (Division level); - Identifies key person forl convening neighbourhood meeting - Facilitate meeting and offers technical advice
2. Elect management committee	- Group deliberates on leadership requirements and elects (including women) in order to implement solutions agreed earlier	-do-
3. Prepare Group's by-laws	- Group discusses guidelines that will assist their collective action and compiles these guidelines into by-laws	-do-
4. Register neighbourhood group with DSS	- Group discusses need for registration and opening of group bank account	-do-

5. Prepare current years' operation plan and budget	- Members prepare a rough sketch of the shared neighbourhood - Group pinpoint areas that are most badly degraded and assign priorities - Group identifies activities and time schedule needed to arrest or minimise soil erosion at these priority areas (cut-off drains, micro-catchments, bench terraces, planting of trees, grass, euphoria , sisal, cactus etc) - Group prepares list of tools and equipment needed to implement rehabilitation plan - Group identifies possible linkages with external partners for technical support and advice	MOARD (District &Division level); - Technical support on survey and layout - Possible support with appropriate tools, animal-drawn equipment and training
5. Routine operation & management	- Management committee co-ordinates individual household as well as group action	MOARD (Division level); - Technical support and Training
6. Review Group's performance and approval of next year's operation plan and budget in annual general meeting	- Management committee convenes meeting - Group discusses extent of conservation interventions at individual and group level (length of cut-off drains, bench terraces, micro-catchment area, tree seedling survival rate, grass strips etc)	-do-

Table 6.4.9 Plan for Strengthening Community-based Health Clinic Group

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review the situation of human health in the community in a special general meeting	- If a community health clinic already exists, management committee calls a special general meeting - If no such clinic exist, a key person within the community convenes a meeting of likely members - Community discusses prevalent diseases and explores ways of combating them (curative and preventive measures)	Ministry of Health (MOH) & DSS (division level) - Facilitate meeting and offers technical advice - Identify key person to call the meeting in case of a proposed new clinic
2. Elect Management Committee	- Given importance of health, the community discuss leadership requirements for the health clinic group and the need to include women - Community then elects management committee	-do-
3. Prepare Group's by-laws	- Community discusses conditions for membership of the Health Clinic Group in terms of membership fees, annual fees and geographical coverage as well as internal management procedures (Bamako Initiative Guidelines)	-do-
4. Register Community Health Clinic group with DSS	- Management committee discusses procedures for handling in-flow of funds and non-prescription drugs as well as the need for registration and opening of bank account	-do-
5. Prepare current years' operation plan and budget	- Management committee identifies non-prescription drugs that will be required on a quarterly basis, operational overheads (rent, clinical officer etc) as well as projected revenue	MOH & DSS (division level); - Technical advice and training
6. Routine operation & management	- Management committee co-ordinates and supervise clinic operations through monthly review of records	-do-
7. Evaluate clinic's performance and approve next year's operational budget	- Management committee calls annual general meeting and explains performance of the past year - Community evaluates clinic performance from the viewpoint of drug availability, costs and quality of service (quick, courteous or otherwise)	-do-

Table 6.4.10 Plan for Strengthening Community-based Animal Health Association

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review animal health situation in the community	- Where no animal health association exist, key person within the community convenes a general meeting of prospective members - Community discusses important animal diseases in the area as well as how such diseases can be prevented or treated	MOARD & DSS(division level); - Identify key person in case of a new association - Facilitate meeting and offer technical advice
2. Prepare group's by-laws	- Community discusses and defines conditions for membership to the association (membership fees, annual fees and geographical coverage) as well as internal operational procedures (location of premises, qualification of employee, drug stocking policies etc)	MOARD & DSS (division level); - Offers technical advice
3. Elect Management Committee	- Community assesses importance of livestock within the community and against this background discusses type of competence required in managing the animal health association - Community then elect a management committee	-do-
4. Register Animal Health Association with DSS	- Management committee discusses need for registering with DSS in relation to opening a bank account and ability to handle contractual relations with drug suppliers.	-do-
5. Preparation of current years' operation plan and budget	- Management committee identifies cost of drugs and other required materials on a quarterly basis including overheads as well as projected revenue	MOARD & DSS(division level); - Technical advice
6. Routine operation & management	- Management committee co-ordinates and supervises drug procurement and sales as well as field follow-up by para-vet - Committee monitors performance through monthly meetings	MOARD & DSS(division level); - Technical support - Training of para-vets/animal assistants management committee
7. Evaluate Association's performance and approve next year's budget in annual general meeting	- Management committee convenes annual general meeting and explains performance of the past year - Community evaluates Association in terms of services provided to the community (availability, costs and quality of service)	MOARD & DSS(division level); - Technical advice

Table 6.4.11 Plan for Strengthening Water Pan Group

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review of general condition and performance of existing pan	- Management committee convenes a special general meeting of Pan Group members - Community takes an inspection walk around the pan perimeter and notes condition of pan - Community discusses ways of improving storage capacity and quality of stored water (de-silting, fencing, separate watering points for animals and humans etc)	MOARD, MOW & DSS, Division level, - Facilitates meeting and offers technical advice - Identifies key person in case of a new association
2. Election of Management Committee	- Community discusses leadership requirement in view of high priority accorded to water by community (include women in the committee) - Community elects a management committee	MOARD, MOW &DSS (Division level) - Offers technical advice
3. Making or reviewing of Pan Group's by-laws	- Community makes or reviews existing by-laws (membership fees, annual fees and geographical coverage, watering rules etc.) - Community amends by-laws as necessary particularly with regard to having a maintenance fund	-do-
4. Pan Group registers with DSS	- Management committee discusses need to register with DSS in relation to opening a bank account and ability to handle contractual relations with a contracted supplier of services e.g. de-silting	-do-
5. Prepare current years' operation plan and budget	- Committee identifies activities required in rehabilitating the pan and estimates cost of required effort, tools, machinery and materials as well as projected revenue from	MOARD, MOW &DSS (Division level) - Technical advice

	water and membership charges	
6. Routine operation & management	- Committee co-ordinates and supervises rehabilitation exercise, ensure collection of water and membership charges and enforces discipline in maintaining water quality	MOARD, MOW &DSS (Division level) - Technical advice on techniques and tools
7. Evaluate Pan Group's performance and approve next year's budget in annual general meeting	- Committee convenes annual general meeting and explains Pan's performance for the past year - Community evaluates the pan with regard to water availability as well as quality and indicates how improvements can be made	MOARD, MOW &DSS (Division level) - Technical Advice

Table 6.4.12 Plan for Strengthening Self Help Rural Water Supply Group

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review of general Condition and performance of existing water supply system	- Management committee convenes a special general meeting of Self-help Water Supply Group members - Community takes an inspection walk from the intake down to the out-let and notes condition of various components of the water supply system - Community discusses what needs to be done in carrying out necessary repairs (fence at the intake, leaks along pipeline etc)	Department of Social Services &Department of Water Development at the Division level, - Facilitates meeting and offers technical advice - Identifies key person in case of a new association
2. Election of Management Committee	- Community discusses leadership requirement in view of high priority accorded to good quality water supply to the community (include women in the committee) - Community elects a management committee	DSS (Division level) - Offers technical advice
3. Making or reviewing of Self-help Group's by-laws	- Community makes or reviews existing by-laws (membership fees, annual fees and water collection rules etc) - Community amends by-laws as necessary particularly with regard to building up an adequate maintenance fund	-do-
4. Self Rural Water Supply Group registers with DSS	- Management committee discusses need to register with Department of Social Services to facilitate opening a bank account for maintenance fund	-do-
5. Prepare current years' operation plan and budget	- Committee identifies activities required in carrying out operation and maintenance and estimates cost implications (labour, materials transport, specialised expertise) as well as projected revenue from membership and annual charges	DSS & DWD (Division level) - Technical advice
6. Routine operation & management	- Committee co-ordinates and supervises operation and maintenance tasks, ensures collection of water and membership charges and enforces the group by-lawsmaintaining water quality	DWD &DSS (Division level) - Technical advice on techniques and tools
7. Evaluate Rural Water Supply Group's performance and approve next year's budget in annual general meeting	- Committee convenes annual general meeting and allows discussion on Water Supply performance during the past year; Committee submits budget for discussion and endorsement by the general meeting	DWD &DSS (Division level) - Technical Advice

3） Rehabilitation Plan for Marginalized Groups

On the basis of a PCM workshop and field observations, as well as information provided by the government and NGOs, the community presently living at Kampi Turkana is clearly marginalized. With no land, livestock and limited skills, the community lives below the poverty thresh-hold of Ksh978 /capita/month. A rehabilitation plan for this marginalized group is expected to assist the community in confronting their present difficult situation. The Plan's key activities are outlined in Table 6.4.13.

Table 6.4.13 Plan for Rehabilitation of Marginalized Group (Kampi Turkana Village)

Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Review of general situation of village community	- Community elders call general meeting of village community	DRD&DSS (division level); Donors - Facilitates meeting - Offer technical advice
2. Documentation of community owned resources	- Community analyses its available resources and potential for self-development	-do-
3. Categorize community members into functional groups (manual workers, craftsmen and craftswomen, adult educators, artists, dancers)	- Community examines skills and knowledge of different community members and assesses how different members can contribute towards material and cultural development of the community	-do-
4. Prepare a five year development plan, annual targets & associated budgets for various functional groups	- Community discusses training potential for different groups to enhance skills and economic advantage at the youth polytechnic - Community explores formation of functional groups for production and marketing of goods and services and identifies agencies with whom it can form working partnerships	-do-
5. Election of Village Management Committee	- Community discusses leadership requirements for implementing agreed plan and elects representative management committee among functional groups, women and youth	-do-
6. Co-ordination, management and format for monitoring and evaluation	- Committee co-ordinates functional groups through monthly meetings and defines monitoring and evaluation format	DRD&DSS (division level); Donors - Technical support and training
7. Evaluate community performance during annual general meeting	- Committee convenes annual general meeting for evaluating performance of different functional groups and offers improvement suggestions	-do-

4） Plan for Addressing the Role of Women and Gender Issues

Within the household, women undertake many roles (Refer to Appendix K.3 for details) but in spite of this, they enjoy a comparatively low social status in the community. The plan, for addressing the role of women and gender issues, has two components as outlined below.

4.1） Introduction of Improved Hand-Operated Grain Processing Machines

Food processing and preparation is exclusively a female task in the Study Area. In this regard, there are already several hand-operated milling machines scattered within the Study Area for processing such grains as maize, sorghum and millet. However, field observations indicated that it takes about one hour and a lot of exertion to process two kilogram of maize. The machines' overall efficiency is therefore assessed to be low both in terms of energy consumed and the opportunity cost of the woman's labor

In order to save the time and effort of women in processing such grains, it is proposed to implement a plan that will introduce improved hand-operated grain milling machines into the Study Area. Activities that will contribute to a realization of the plan are summarized in Table 6.4.14.

4.2） Gender Sensitization Plan

Improvement of the general condition of women within the Study Area requires a multifaceted approach that includes access to education, formal employment, economic assets and decision-making positions. The gender sensitization plan is therefore aimed at preparing the ground for facilitating the implementation of the stated approaches. Indeed, in the Baringo district's current five-year plan, gender sensitization is identified as a major component of the work of the Department of Social services.

The 5-year gender sensitization plan will mainly be a government initiative with the possible support and collaboration of donor agencies as well as local NGOs. The Plan envisages a number of activities as summarized in Table 6.4.15.

Table 6.4.14 Plan for Introduction of Improved Hand-operated Grain Milling Machines

Plan Activity	Sharing of Responsibility	
	Community	Supporting Agency
1. Survey of alternative types of hand-operated grain milling machines	- Households within study give information regarding location of any hand-operated machines	MOARD (district, division level); - Investigate different samples of hand-operated grain milling machines in the country including the Study Area
2. Evaluate identified hand-operated machines	- Assessment of machine suitability by selected women groups	MOARD (district, division level); - Formulate assessment guidelines for women groups, KIRDI and KARI (energy efficiency, handling, durability, spares, put-put quality etc) - Evaluate assessment of various machines and gives a suitability ranking
3. Introduce 2-3 types of recommended machines on a pilot basis in Study Area	- Women groups assist in identifying best location pilot machines	MOARD (district, division level); - Monitors performance of pilot machines and prepares a report after six months of pilot initiation
4. Encourage local fabrication or importation and appointment of stockist in Marigat	-do-	MOARD (district, division level) DSS (division level); - Discuss with interested firms in Nairobi and Nakuru regarding possible fabrication or importation of hand-operated milling machines and appointment of local stockist in Marigat
5. Identify appropriate credit mechanism for purchasing milling machines	- Women groups initiate and intensify group savings and contact local NGOs to negotiate credit arrangements for buying milling machines	MOARD (district, division level), DSS (division level); - Discuss with local NGOs (Catholic church, World Vision, CCF) credit procedures for - Purchase of milling machines by individuals and women groups

Table 6.4.15 Gender Sensitization Plan

Activity	Responsible Agency
1. Establish a gender sensitization unit in Marigat managed by a gender issue specialist	- IMSC,DSS (Central Government), DWC, DSS District level
2. Facilitate mobility of gender specialist	- DWC, DSS, District level
3. Formulate a gender sensitization programme in consultation with relevant stake-holders (provincial administration, Maendeleo ya Wanawake, local women groups and NGO's)	- DSS (District and Division levels) - DWC
4. Implement gender sensitization programme that will include meetings (barazas) and workshops on such themes as gender roles (men and women), access to education, traditional practices in relation to family health and community welfare	- Dept. of Social Services (District and Division) - DWC

5） Capacity Building for Rural People

The poor rural communities in the Study Area are constantly faced with the challenge to improve their livelihood. Given the systematic decline in government support in the recent past, and the introduction of cost sharing policies, the challenge has become even more pertinent. While addressing these challenges, we need to realize that solutions developed within the community and by the community members are more likely to be appropriate, successful and sustainable than those which are adopted from outside. To a great extent, capacity building of various members of the community goes a long way in facilitating the search for home grown solutions and ensuring community ownership of the projects. Areas that need to be addressed include awareness creation, leadership and management training as well as more specific technical training.

Findings from the PRA exercise were very clear about the fact that most villagers have no access to capacity-building schemes and extension services. The observation that extension services from GOK staff used to be available before but are rare now, and that GOK staff are stationed in certain places but they do not assist the villagers, was echoed in most PRA village sites like Kamaech, Noosukuro, Ntepes etc. The presence of the NGOs is recognized but is evidently in limited areas for example in the form of NGO provision of school sponsorship; NGOs also target few beneficiaries, owing to limitations in funding.

In quite a number PRA sites, villagers mentioned problems that suggested a low level of awareness. For example, though irrigation water featured prominently in development projects of villages like Ntepes, Ndambul etc. it is vital that the villagers are helped to become aware of the link between agricultural outputs, environment and efficient use of water, rather than just desiring water for the sake of it. Similarly, numerous groups have been shown to exist in the Study Area, groups such as the Sandai, and their leaders would need some training as part of a group-strengthening program. Finally, where villagers already practice animal husbandry with little skill and knowledge about the subject, it has been indicated that there is a need for training in order to boost their efforts.

5.1） Community Awareness Creation

One viable way to stimulate this search for homegrown solutions by the community, is to organize flexible and participatory capacity-building sessions for organized community groups. These sessions should focus on creating more awareness of resources, the problems facing the community, the existing opportunities, prioritization of learning areas and/or development action that can be collectively implemented. Awareness creation would need to address both felt (manifest) needs and unfelt (latent needs). The most important output of awareness creation workshops is the formulation of a plan of action, which may include further training to allow participants to acquire knowledge and skills on more specific issues. Where learning areas chosen by the community require technical input, relevant technical persons will be called upon to provide the knowledge and skills.

Equally important is the need to conduct follow-up capacity-building sessions for each training course, either on the request of the groups or in response to problems experienced. In this regard, addressing the problem on a timely basis is the most effective training method because the learners can immediately apply their newly acquired knowledge and skills.

This plan will be targeted at dip groups, input supply associations, cooperative societies, women and youth groups, water and soil conservation groups, community based health groups, community-based animal health associations, water pan groups and marginalized groups.

Table 6.4.16 Community Awareness Creation

Activity	Supporting Agency
1. Together with the communities or groups, identify sites, self help groups and farmers' organizations or community members for awareness raising in human health, education, literacy, livestock, agriculture, income generation, water and soil conservation.	Members of the groups, DSS, NGOs. MOARD,
2. Formulate a focused awareness creation training plan with these community members or groups	SDO, NGOs. MOARD
3. Awareness creation on development issues in particular functional literacy, animal husbandry, education, income generating activities, health and sanitation, and environmental conservation	SDO
4. Implement the awareness creation plan using Participatory Learning and Action (PLA) methods such as PRA, DELTA1/ etc. through training methods which will include role plays, study tours, demonstrations, focus group discussions etc.	SDO, NGOs. MOARD
5. Facilitate the development of plans of action by the participants, based on the awareness created.	SDO
6. Conduct follow up training's on leadership and management or provide more specific skills and knowledge in the relevant topic being addressed, for the participants.	SDO

5.2) Management and Leadership Training

The success of all community initiatives hinges on effective leadership. In order for the existing and new community groups to realize their full potential and succeed in their activities, their leaders need to acquire the appropriate leadership skills. Leaders include the chairpersons, secretaries and treasurers of existing groups as well as elders, chiefs, teachers etc. In particular, female leaders and other women exhibiting unique leadership qualities should be encouraged to attend these sessions.

1/ DELTA is an acronym for Development Education for Leadership Teams in Action, a general awareness training program.

Table 6.4.17 Management and Leadership Training

Activity	Supporting Agency
1. Identify practicing and potential leaders of existing women groups, community groups, cooperatives, farmer's association's etc.	SDO, Community, NGOs
2. Develop a curriculum for leadership and management training	SDO
3. Formulate a specific training plan on management, financial management, book keeping, communication skills, leadership skills, monitoring and evaluation etc. for the leaders	SDO, NGOs
4. Implement the training using Participatory Learning Approaches and through training methods, which will include role-plays, demonstrations, study tours etc.	SDO
5. Facilitate the development of operational plans of action by the leaders participating in the workshops	SDO
6. Provide follow up training's and refresher training at a regular basis.	SDO

5.3) Training's for Community Owned Resource Persons (CORPS)

Within the communities in the Study Area, there are people who already provide useful services in the areas of health, livestock, and agriculture etc. Livestock keepers for example, are known to buy drugs, treat their animals and other people's livestock, by themselves. It would be useful to provide more up-to-date and systematic knowledge and skills to enable them to better practice livestock keeping. Already, systems for community health providers such as Traditional Birth Attendants (TBAs), or animal health providers are common in the country, and such systems can be introduced to the Study Area. An essential requirement for these trainees is that they should demonstrate a potential to run their activities as an income-generating activity or at least on a cost-recovery basis.

Table 6.4.18 Training's for Community Owned Resource Persons (CORPS)

Activity	Supporting Agency
1. Identify community members and groups, who are actively involved in providing specialized services and exhibit a potential of becoming Community Own Resource Persons (CORPS) in technical areas such as livestock, agriculture, human health, environment etc. Potential groups may include dip groups, community based health groups and community based animal health groups	SDO, Community, Livestock Dept., MOH
2. Facilitate the establishment and/or, consolidation and strengthening of an organization of the CORPS who will provide technical advise and services to the community	SDO, Community, Livestock Dept., MOH
3. Identify organizations, NGOs or technical (professional) persons who can be linked up with the CORPS, e.g. veterinary officers or livestock pharmacies for Community Based Animal Health and CORPs	SDO, Community, Livestock Dept., MOH
4. Draw a specific training plan for the CORPs	SDO, Community, Livestock Dept., MOH
5. Provide technical training and business training in phases, for the resource persons and groups utilizing training methods, which will include study tours, demonstrations, focus group discussions etc.	SDO, Community, Livestock Dept., MOH
6. Facilitate the drawing of a plan of action to be implemented as an income generation activity by the CORPS	SDO, Community, Livestock Dept., MOH
7. Assist the community resource persons with initial capital, materials, equipment's, inputs etc. to implement their action plans	
8. Provide follow up training's and refresher training's for the CORPS.	Community, SDO, Livestock Dept., MOH

6.5 Sector-wise Development Plan

In the following section, detail development plans for each sector, which is indicated in Figure 6.2.4 Area-focused Master plan, such as environment, livestock, agriculture, small-scale industry, human resource, agricultural and rural/social infrastructure, rural health and sanitation, and others; are discussed. Each sector contains concrete programs or projects and they are consisted with the programs and projects shown in Figure 6.2.5.

6.5.1 Environmental Conservation Plan

1) Environmental Degradation and People's Perception of Natural Resources

As the natural resources in the Study area have decreased, problems have in turn shown up on lands. Problem land includes over-grazed rangeland, denudation of the land, and soil erosion beginning with sheets, then rills and leading to gullies. The observed erosion, in most cases, had already reached an alarming degree of land degradation. The worst affected areas are the valley complex of the Arabal area, the hilly areas of Kimalel, and the western part of the Study Area which runs along the Nakuru – Kapedo road. There are also some completely denuded and eroded patches scattered over the Study Area. These are found mostly in the Eldume, Ngambo and Kiserian Locations.

The same situation can be found over the catchment area of Lake Baringo, an area of 6,670 sq. km. From observations of satellite images and the field itself, vegetation change is very striking along the topographic gradients, with temperate forests in the highlands, and desert-like shrubs, such as drier Acacia species, on the valley floors. The soils found on top of the slopes are clays and loams, and the highlands are the least affected by erosion. However, as one goes down to the foot of the highlands, semi-deciduous wooded grassland occupies more of the area, and the advanced stage of sheet and gully erosion is widespread. In particular, areas dominated by weathered tuff and shallow top soils are very prone to a high degree of soil erosion. Also, found in relatively gentle slopes is soil erosion caused by agricultural activities. The farms have not yet introduced any soil conservation schemes.

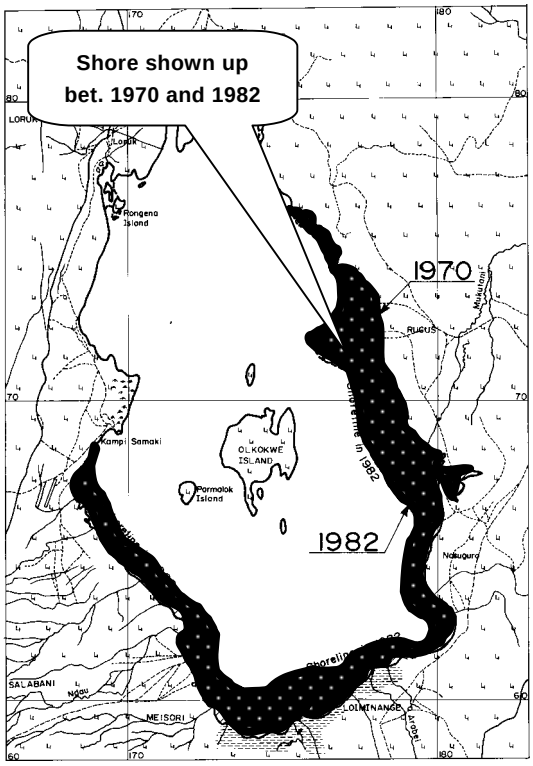


Figure 6.5.1 Shore shown up due to Sedimentation

The problems mentioned above have resulted in a large amount of sediment being washed into Lake Baringo. Though no accurate date exists, a study estimated that approximately 2.5 million tons (1.7 MCUM) of soil is annually brought into the Lake (Water Resources Assessment Study, 1987). Looking at the topographic maps produced in 1970 and 1982, about 29 sq. km lake shore had newly shown up due to sedimentation (see right photo), which corresponded to 18 percent of the 160 sq. km lake surface area in 1970. The average depth of the lake nowadays is only around three meters, unbelievably shallow, in contrast to more than five meters measured in the 1960s.

Living in the conditions of a deteriorating environment, most local people are very much aware that the natural resources surrounding them have been taking downward trend. Though they have developed a number of survival strategies to cope with this trend; namely, range management, herd dispersal, herd diversification, herd accumulation, agriculture promotion and knowledge of plants uses, it can be foreseen that almost all rules concerned with access to and management of the natural resources would be eroded and would become impossible to apply. PRA results highlight the people's perception today concerning natural resources, as shown below:

Table 6.5.1 Trend of Natural Resources identified in PRA

Village, Location	Land/Soil	Grass Land	Water	Trees	Vegetation
Kapkole, Kimalel	↓		↓	↓	
Ndambul, Marigat	→		↓	↓	↓
Marti, Salabani	↓	→	↓	→	
Ntepes, Eldume	→	↓	↓	↓	→
Kamaech, Sandai	↓		↓	↓	↓
Chemorongion, Arabel	→	↓	→	↓	
Noosukuro, Mukutani		↓	↓ **(lake)**	↓	↓

Note: ↓ deteriorated, → constant

There are cases where people said the trend of the environment remained constant, but these cases usually rather suggest, except in few cases, that the environment had already deteriorated long ago rather than that the people are blessed with abundant natural resources. Marti Village in Salabani Location is one of these examples. RRA revealed that the area was greatly suffering from a fuelwood shortage since the number of trees had already decreased a long time ago. Also, the RRA revealed that an area located close to Kampi ya Samaki, which falls in the same Salabani location, is suffering the most from the fuelwood shortage.

The seven villages in which PRA was carried out, all stated that problem land had been expanding. Out of these villages, the most sharp deteriorating trends were found in villages such as Kapkole, Ntepes, Chemorongion, and Noosukuro. Kapkole is located in a

hilly area, the soil of which is very thin and is thus susceptible to erosion. A large area of and in Ntepes has been cleared for farming and trees have been exploited for construction, leaving bare land and gully erosion. There has been a significant reduction of tree cover, good bush and grazing land in Chrmorongion as the population has increased. The same phenomenon has taken place in Noosukuro.

Grass land is very important in every place across the Study Area, and to a larger extent in the locations of Arabal and Mukutani. The grasses in these locations have been degraded because of overgrazing. There is also a case that an invader plant, like a Prosopis, have taken over the grazing land though the quantity itself may look increased. Somewhat unique is the perception of the relationship between increased livestock numbers and overgrazing. During PRA and PCM workshops, the local people recognized the increase in livestock numbers. However when the perception came to an individual level, as revealed by the RRA, the way of thinking changed so that it was perceived that livestock numbers had not increased but had rather greatly decreased.. The contradictory perception came about by comparing current livestock to the livestock once owned by the fathers of the interviewees.

The fathers of the interviewees once possessed much larger sizes of herd, but now the interviewees only have small herds. There used to be many Il Chamus who had hundreds of livestock but now only a handful herders have over a hundred animals. Most people, individually interviewed, tended to attribute the cause of grass degradation to cattle brought in by others. There are cases in which the people in Salabani location bring their cattle to the grassland in Rugus during the late dry season, and the people in Kiserian and Lower Mukutani herd the cattle to the hillsides close to Arabal. Both perceptions, given through the workshops and RRA, are true and suggest that the people are facing a dilemma. The individual perception, though legitimate, may give rise to difficulties if there is intervention to try and control the size of herds.

2） People's Natural Resource Management

There is, in most cases, a general understanding among the community members regarding the proper and improper use of natural resources. However, the management of natural resources varies from one community to another and refers to either availability or scarceness. The resource management found in Ndambul in Marigat Location is the most sophisticated, and includes seeking advice from government extensionists on planting trees and constructing terraces.

Cutting down trees and making charcoal are restricted unless otherwise permitted. People in Ndambul know this is a national policy on environmental protection implemented by the Chief's office, and they report the theft of natural resources to the Headman. Villagers in Chemorongion stated that no one was allowed to cut down trees without permission from the Chief's office. What was mentioned in Marti village was that a person who misused

natural resources would have to appear before the Village Elders and possibly the Assistant Chief to answer the charge concerned.

There are, on the other hand, some communities that do not intentionally manage their natural resources. Natural resources in Noosukuro are not conserved or developed by any organization. Access and use of various natural resources is simply open to the community in general and is not controlled in any way. There is very good pasture land in Rugus. This is also simply open to the community, though a pattern of refraining from grazing during the rainy season could be sometimes found. People in Kapkole still cut down trees and make charcoal in a way and cultivate the catchment area seemingly without restrictions.

3） Environmental Conservation

As discussed above, the environmental condition of the Study Area has deteriorated to date. To conserve the environment, action relevant to natural resource management has to come first. Also, the environment discussed here is of very cross-sectorial issues, straddling many human activities such as animal husbandry, farming, and generating a daily livelihood. This Study therefore takes into consideration “Natural Resource Management” and the “Cross Sectorial Approach” in formulating conservation programs.

Many past experiences tell us that a conservation program rarely works unless the program satisfies the people’s urgent needs, which are unfortunately not particularly concerned with any environmental conservation. This fact implies that the programs proposed should be integrated with a project that could realize the people’s urgent needs. One more issue is to recognize that the villagers cannot rely heavily on the Government due mainly to budget constraints. This leads to a prerequisite that self-independent programs be promoted and also that incentives, either individual or group, be prepared for the conservation programs.

Taking the above factors into consideration, this Study proposes the following six action programs to contribute to the environmental conservation:

3.1） Program 1: Promotion of an improved stove (Jiko)

Though the PRA workshops did not raise the issue of necessity of an improved stove (Jiko), women individually interviewed in the RRA often raised the difficulty of fetching firewood. Most women interviewed replied that firewood was becoming scarcer and scarcer, and the time they needed to fetch it kept on getting longer and longer. The PRA also clearly showed the downward trend of wood resources.

There are options for conserving the wood resources by means of; improved Jikos, solar cookers, biogas, Bellerive cooking stove (Kuni Mbili) but none has been tried in the Study Area before this Study. An improved Jiko can save a considerable amount of firewood;

for example Maendelo Jiko saves about half amount and Enzaro Jiko as much as third quarters of firewood, thus contributing to the conservation of scarce resource. Also, reducing the fetching time could spare other activities such as income generation.

Therefore, this Study undertook a program of promoting Enzaro Jiko as one of the verification projects. The program was started at Kyampi ya Samaki, Salabani locaton, where the women are the most suffering from firewood shortage. The Jiko has been diffused to other locations during the verification project as seen in the figure, and a total of 87 Jikos have been constructed as of September, 2001 (see Figure 6.5.2).

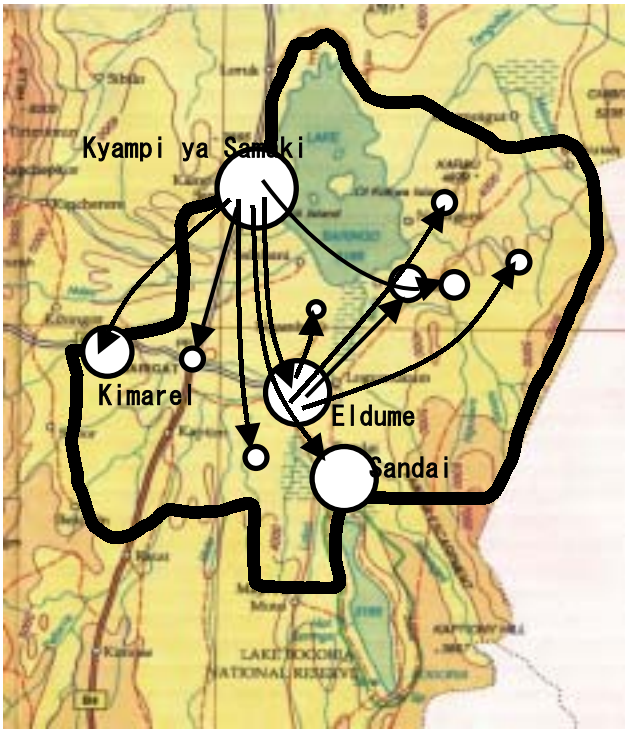


Figure 6.5.2 Diffusion during the Verification

This program is very promising because: 1) the Jiko is made of local materials only such as anthill soil, stones and water; 2) the Jiko can save firewood by 63 percent as proved through the verification project; 3) it saves cooking time, say about one hour for supper, as there are three fireplaces (see left-below photo); and 4) it gives health/hygienic effect and more security for children. Chicken and goats are no longer messing the food that are cooked at higher place than 3-stones and placed on back-top of the Enzaro Jiko. No child turns over food because the food is placed on the Jiko. Security for children is now kept so that mother feel very happy and also elder children can help mother in cooking in much safer situation.

To pursue the Jiko promotion; a guide is: 1) a demonstration be done as the first stage; 2) some time after the demonstration, GOK/donors shall visit the villages again to facilitate several ordinary women to form a group and then construct the Jiko by themselves; 3) in line with regular monitoring to avoid technical error in the construction, neighboring villages be also visited to further diffuse the Jiko, and 4) in parallel with those above, new version of Enzaro Jiko, two fireplaces Jiko shown in right-below photo, should be tried in order to further expand to poorer households (poor family doesn't have separate kitchen house so that full sized Jiko cannot be accommodated).

No direct negative impact associated with the Jiko is foreseen. However, there are some

cases that discourage the women to install the improved Jiko in their house. The Jiko requires water, say 5 to 7 litter, to maintain by smearing it with soil and cow dung usually once a week. Water scarcity area like Salabani location may have difficulty to well maintain the Jiko, for small sized Jiko should be introduced, requiring less water for the maintenance.

A Full Sized Enzaro Jiko (4'x3')

A Small Sized Jiko (2 fireplaces)

Another case discouraging the women to install the Jiko is that the Jiko cannot warm the house as compared to the conventional 3-stone Jiko. In a colder area like upper Mukutani and Arabal, they sometimes need to warm the living house by making fire in the stove. Conventional 3-stone stove could better do it than the improved one. Also, Mukutani and Arabal locations are very wild animal prone area so that they need make fire visible to the animal. 3-stane Jiko could well function in such conditions. 3-stone Jiko should not always be demolished even if the improved one was introduced in these areas.

The program should also incorporate a campaign of raising awareness for conserving wood resources. This includes such promotion of; covering food when cooking, using dry wood for cooking, storing firewood during dry season, soaking dry grains overnight, and planting trees which starts with household tree, group tree, and then community forest. Upon recognizing firewood saving reaching to as much as by third-quarters thanks to the Jikos, people could have time to put the environmental conservation, say tree-planting, in practice.

3.2） Program 2: Conservation of the upstream areas of pans

Pans are a very important means in securing water and many can be found in the Study Area. Though almost all villagers recognize the importance of the pans, the difficulty of pan maintenance was very much proved through a verification project tried in Rugus of Mukutani Location. Since the pan is fed by extremely turbid water running only during heavy rainfalls, it is easily silted up and it is very difficult to maintain more than 10 years.

In order to have the pan last longer, whenever pan construction or the desiltation of a pan

comes into sight, conservation of the catchment area should also be programmed in parallel. Conservation includes: planting locally available grass in the upstream area of the pan, rain harvesting accompanied with contour ridges that can prevent the soil from getting into the stream, and fencing off livestock moving around and upstream the pan. Of those, fencing off livestock moving around and upstream area of the pan is the most simple and reliable mean. If livestock were well kept off from the area, natural vegetation would show up and grow enough to conserve the area. This program should be at first tried in Rugus, where pan rehabilitation was carried out as one of the Verification Projects.

3.3) Program 3: Conversion of cattle, the traditional savings, into cash savings

The Study Area obviously has more livestock than the resources can stand. There are many places that indicate they have been overgrazed. To conserve vegetation, a program to reduce the number of livestock will be devised though this attempt may be extremely challenging. The livestock in the Study area is literally same as a savings account in a developed country. A pastoralist wants a reserve of live animals for reasons similar to those of a person in a developed country who wants to save more in order to be prepared against any unexpected occasions such as disasters, drought, etc.

However, with the environment already depleted, it becomes more difficult to increase the size of the herds or even to keep the present size. As a result, they often have to sell the livestock when they need immediate cash, which usually is the time auction prices are the lowest. They usually need cash when they need to buy food, mostly during severe drought seasons when the livestock may not be able to survive, and when schools ask parent for the fees required and contributions.

With better veterinarian services, market information and mobile banking provided, they could manage to sell when auction prices are high and keep the cash in case of an emergency; in other ward, they could convert part of their herd to real cash savings. Also, if the school informs parents beforehand how much the school requires in the coming year, and not on occasional basis often done at present, the pastoralist can plan to sell the livestock when the price is high and keep the cash for future school fees. This attempt may reduce the number of the livestock.

In pursing this program, financial institutions reform should also be examined though this would go beyond this Study's scope. Under current situation, commercial banks do not allow meager people to have their bank account due to the minimum deposit, say 5,000Ksh – 10,000Ksh and monthly commission to maintain the account. Those branch offices are located only in district capital like Kabarnet, which requires expensive transportation to come for people living in rural area (about 400ksh required from Arabal to Kabarnet). Postal saving should become in charge of pursuing this program. There is a postal saving in Marigat, and this should go to auction yard as a mobile branch office.

3.4） Program 4: Setting up an individual pasture plot close to homestead

Areas near homestead are mostly bare because of livestock crowding. Some places often accompany with sheet and rill erosion. If an individual pasture plot is set up directly beside the homestead, the plot could contribute to soil conservation. This plot is primarily designed for fattening up cattle which are to be auctioned soon. In combination with the program of “conversion of cattle, the traditional savings, into cash savings”, this program would work on individual incentives and soil conservation simultaneously.

Attention may be required in sorting out plot deeds, since most land is communally owned. This program can start after the relevant authority, for example the village elder, has approved it. A group pasture plot may be tried where a number of houses are located together. The villager will set up the fences at their own expense, but the program could provide them with the pasture seeds. This program can start at Arabal as there is already communally owned pasture land.

3.5） Program 5: Rehabilitation of bare and eroded land

There is land which is completely bare and already places where gully erosion has taken place. This problem land is mostly communal and so it is very difficult to work on individual incentives. External support will be required in order for this program to succeed though the program itself should be community-based.

The first step to be taken is the set-up of a fence so that livestock can be prevented from going onto the problem land. It is noted that if the land is under more than two ethnic groups, the fencing shall be demarcated by the ethnicity. Soil conservation shall then be carried out in the fenced land, which would mostly be in the form of constructing a contour ridge in order to retain scarce rainfall. Then, according to the community’s need, either grass or trees suitable for firewood shall be planted. Community members are required to contribute labor to set up the fence and make the ridge, while the program could provide the necessary machinery and materials. This program should be started in locations such as Kimarel, Eldume, Arabal, and then Salabani upon consensus with the communities.

There are many types of fencing to choose from. Locally available fences are made from thorn bush, Euphorbia tree, cactus, sisal, etc. Thorn bush fences can be made very quickly and do not cost money. However, this kind of fence is very vulnerable to termites and needs a lot of upkeep. Other kind of fencing are live fence which take about 2 to 3 years to grow thick. Therefore, where rehabilitation is urgently required, it is suggested that a wire fence be set up, which is solar-power-electrified. However, locally available live fencing should also be set up right along the wire fence. After the live fence grows high enough to prevent animals from entering, the wire fence shall be moved to next place where rehabilitation is required.

3.6） Program 6: Tree planting

Trees supply essential wood produce, preserve water catchment's areas, control soil erosion, and even provide employment opportunities. However, tree planting does not have immediate benefits, and requires a lot of care till the tree grows enough to withstand against animals. The ASAL climatic condition is another hindrance in growing trees well. All these factors make it difficult to effectively establish a tree-planting program as has often been proved in other areas, especially under conditions where the people have a subsistence lifestyle.

This Study therefore suggests that the program follow the promotion of the improved Jiko. Where the improved Jiko has already been introduced, and when the people become aware of the preciousness of resources, a tree-planting program would probably better work. The program shall primarily look at household planting and farm area's planting, which work on individual incentives. Then, public institutions like schools, dispensaries/hospitals and Chief's office shall be envisaged for the planting. Community based planting will be tried at a later stage of this program on consensus with the relevant villagers. The species suitable for planting under ASAL condition are Commiphora, Euphobia tiriculli, Opuntia vulgaris, Sensevcria, etc. Some species such as Neem tree, Aloe Africana, Acacia Senegal, and Tamarindus are well known of its fast growing and its high value.

There is a research institute, called KEFRI, located in Marigat. This institute conducts research looking for suitable tree species for ASAL areas, and has been providing trees to the local people (about 200Ksh per seedling). KEFRI officer should be invited whenever improved Jiko is opened (Opening usually done one to two weeks after the construction). During the opening of the Jiko, firewood consumption should be measured as well as the cooking time. As the participants recognize the energy efficiency of the Jiko, the KEFRI officer makes campaign about tree-planting and on-site selling so that the participant would be motivated and take action.

4） Watershed of Lake Baringo

Though this Study undertakes Marigat and Mukutani Divisions, the watershed of the Lake Baringo should also be examined from a broad environmental point of view. This section describes the environmental condition of the Lake Baring watershed as well as priority measures to protect, based on satellite images, previous studies (e.g. Range Management Handbook, 1994) and field observations (satellite images shown in Appendix).

The total catchment area, draining into the lake, is about 6,670 sq.km which is divided into several number of sub-catchments. Of the sub-catchments, Perkerra and Molo are the biggest ones; 1,310 sq.km and 2,145 sq.km respectively. The Perkerra River has the origin in the most south-western part of the Baringo (near Eldama Ravine), and the Molo

river starts near as far as Elburgon area Nakuru District. The catchment of the Lake Baringo is characterized by steep environmental gradients that divide the area into several agro-ecological zones. Altitude ranges from over 2,500 m amsl in the Tugen Escarpment to under 1,000 m amsl in the central and northern parts of the catchment area. Rainfall varies along this gradient form approximately 1,500 mm per annual in the higher elevations to less than 500 mm in the lower zones.

The cooler and more humid highlands such as Tugen Hill, Eldama Ravine Area, Elburgon area, and Laikipia Plateau, have an elevation in most cases from 1,800 to 2,200 m above the valley floor. Soils are generally formed on mostly old (Pliocene) volcanic rocks, and they are shallow and very stony due to the prevailing steep and long slopes. However, found on top of the slopes are deeper red clays in the Tugen Hill, Eldava Ravine area and Elburgon area, and shallow gravelly clay loam and some deeper gray clay in the Laikipia Plateau. These high-level uplands are the least affected by erosion. This is mainly due to good vegetation cover and favorable climatic conditions.

The highlands of south and south-west of the catchment areas and summits of the Tugen Hill are partly occupied by evergreen forest. Thanks to the high productive potential, most of the area, except the evergreen forest, has been converted to farms, pastures and plantation forests. There are a number of forest reserves already gazetted that protect the original evergreen forest. Most of the land is privately owned and is not considered to be communal rangeland. Found on top of the eastern rift escarpment is evergreen bushland, abundant species of which are Croton dischogamus, Maytenus sp., Euclea sp., etc. Shurbs and trees found on top the Laipikia plateau grow to about 6 to 8 m.

Evergreen and semi-deciduous bushland occupies most of the slopes of Tugen Hill and eastern rift leading to Laikipia Plateau. The bushland also occupies a part of Eldava Ravine and Elburgon areas with a large extent of farms and private rangeland. This vegetation is dominated by Dodonaea viscosa and Croton dichogamus. As one goes down to the foot of the hilly areas, semi-deciduous wooded grassland is occupying more of the area. The species are Acacia tortilis, Combretum, Heeria, etc. Little erosion can be found in the upper part of the slopes, however an advanced stage of sheet and gully erosion is widespread in this lower part of the hills. Especially, areas dominated by weathered tuff and shallow top soils are very prone to a large extent of soil erosion, one of which can be found in Kimalel Lacation.

Evergreen wooded grassland can be found at the Arabal valley and the lower part of the eastern rift escarpment. The valley area is affected by a complex of geological formation, and sheet and gully erosions have already taken place and are being widespread. The area is dominated by mainly Balanites aegyptica, Acacia gerardii and Cynodon dactylon grass. The grass is perennial and very important forage in this area around. However, overgrazing is giving a pressure on further soil erosion. Also, found in a relatively gentle

slope is soil erosions caused by agricultural activities. The farms have not yet introduced any soil conservation scheme, thus loosing fertile top soil and deep gully erosion taking place.

Semi-deciduous woodland, reaching to as high as more than 10 m tall, dominates the lower part of the catchment area especially along rivers, northern part of which is called Njemps flat. Major species are Acacia tortilis and Acacia elatior, those of which seldom lose all their leaves in the dry season. The land here is highly eroded and bare in many places although perennial grasses can grow if protected. The vegetation is gradually changing from the semi-deciduous woodland to deciduous and semi-deciduous bushland as one goes towards south along the lower part of the catchment area. The south area, upstream of the lower part of the catchment area, is dominated by Acacia brevispica, Acacia mellifera and Acacia tortilis, Acacia nilotica, etc.

Deciduous bushland dominates western part of Lake Baringo where Acacia mellifera, Acacia reficiens and Acacia nilotica can be found. Shrubs grow 3 to 5 meters, and perennial grasses such as Cymbopogon species are very important in this area. The area is one of the most highly eroded ones and occasional floods take place, carrying soils as well as gravel into the Lake. Deciduous shrubland with Acacia mellifera, Acacia reficiens and Acacia senegal are taking place in the floor of the Valley and over the Study area. This is the driest and probably least productive areas. This area was mostly open grassland before the independence. An invasion of Acacia mellifera and Acacia reficiens has been taking place since late 1960's. Extensive soil erosion can be found in this area.

Taking into account above discussions, a measure to protect the watershed by area is suggested in the following table. As formulation of detailed action program over the watershed of the Lake Baringo is beyond this Study's scope, given hereunder is a guidance that should be tried upon feed-backing the result of the implementation in the Study Area:

Table 6.5.2 A Guide to protect the Lake Baringo Watershed

Cluster	Area	Priority Measures
No. 1	High land: Tugen Hill, Eldama Ravine, Elburgon, Laikipia Plateau	No urgent measure required. Even commercial forestation could be promoted as already practiced in some areas.
No. 2	Slope of Tugen Hill, Eastern rift to Laikipia	Rehabilitation of denuded and eroded land accompanied with soil conservation.
No. 3	Arabal Valley	Rehabilitation of denuded and eroded land accompanied with soil conservation. Conversion of cattle into cash saving Soil conservation together with rain-harvesting technique.
No. 4	Lower part of L. Baringo Watershed	Rehabilitation of denuded and eroded land Promotion of individual pasture land
No. 5	Western part of L. Baringo	Rehabilitation of denuded and eroded land Soil conservation together with rain-harvesting technique

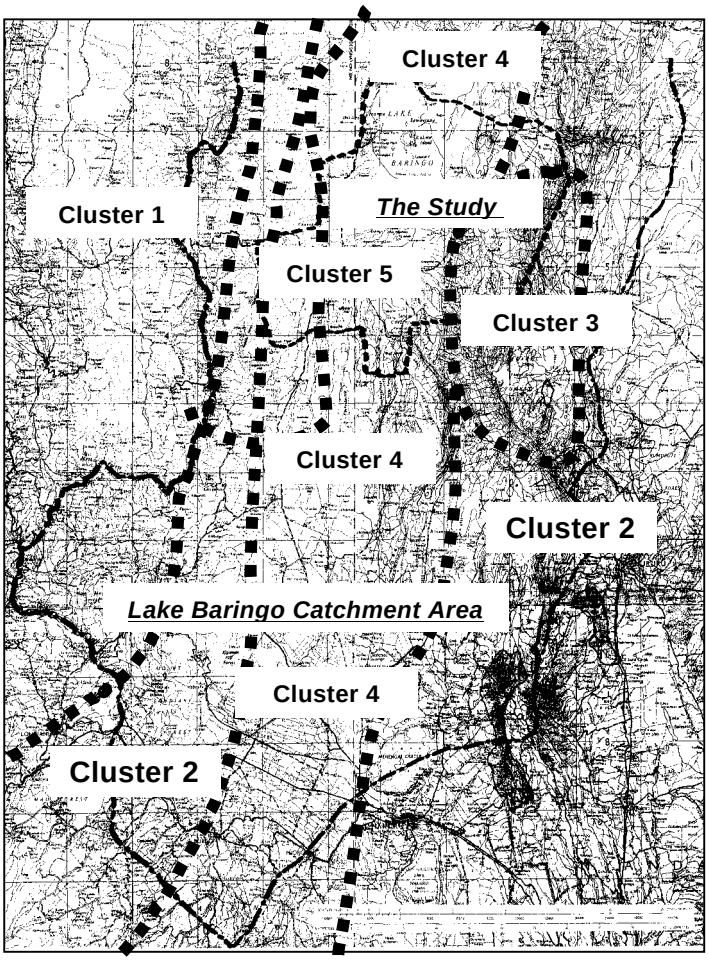


Figure 6.5.3 Clustering of Lake Baringo Catchment

Table 6.5.3 Implementation Schedule of Environmental Conservation Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
1. Improved Jiko	**Short Term (1-5 year)** - Demonstrate the improved Jiko at Kyampi ya Samaki, which is the most suffering from firewood shortage (already done during verification), and do the extension over the location of Salabani.	Salabani L.	250 (20% HHs)	MOARD, Donors, Villagers
	- Do the same of above in and around Marigat town where many people do buying firewood and charcoal.	Marigat L.	200 (10% HHs)	-do-
	- Extend the improved Jiko in Eldume and Ngambo area.	Eldume/ Ngambo L.	400 (20% HHs)	-do-
	- Introduce the improved Jiko to the schools in Marigat Division.	Marigat D.	18 (50%)	MOEST, MOARD
	Mid Term (6-10 year) - Continuously extend the Jiko in the areas of the short term.	-do-	500 (10% HHs)	MOARD, Villagers
	- Expand the program to other locations in Marigat Division where the demand of firewood is narrowly meeting the regeneration of the wood at present.	Loboi L., Sandai L., Kimalel L.	400 (20% HHs)	-do-
	Long Term (11-20 year) - Continuously extend the Jiko in the areas of Marigat location.	Marigat D.	700 (10% HHs)	-do-
	- Expand the program to Mukutani Division where, at present, the regeneration of the wood surpasses the firewood demand but which, in the long-run, is to face firewood shortage unless this program is put in place.	Mukutani D.	400 (20% HHs)	
2. Conservation of upstream area of Pan	**Short Term (1-5 year)** - Avail necessary material for fence and grass seeds.			Donors
	- Put up a fence covering an upstream area of existing pans (this is by all means required when the pan is rehabilitated).	Mukutani L, Loboi L., Kapkuikui L.,	6 (20% of total)	Community
	- Plant locally available grasses in the upstream within the fence in order to generate better vegetation of the catchment.	Sandai L.		Community
	- Try and find suitable trees to be planted along the fence, and/or in the catchment and around the pan.			KEFRI, MOENR
	- Introduce rain-harvesting technique in line with the tree planting to be done in the catchment area.			MOARD, Community

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	Mid Term (6-10 year) - Expand the program to other pans in line with the rehabilitation of the pans and whenever new pan is constructed.	Mukutani L, Loboi L., Kapkuikui L., Sandai L., Arabal L.	6 (20% of total)	MOARD, NGOs
	- Plant the trees that have been found suitable during the short-term period.	-do-	-do-	Community , MOENR
	Long Term (11-20 year) - Do the same as mid term activities whenever new pan is constructed and/or any rehabilitation work of existing pan is done.	Marigat D., Mukutani D.	12 (40% of total)	-do-
	- Promote this program in other ASAL areas.			GOK/NOGs
3. Conversion of cattle, the traditional savings, into cash savings	**This program goes with Livestock Marketing Program.** - Additional activities are; 1) provision of mobile banking at auction yard, 2) provision of market information through Chief, county council members erected in the area and divisional livestock officers. - Also, schools are required to inform parents beforehand how mush the schools require in the coming year, and not on occasional basis often done at present (the pastoralist could plan to sell the livestock when the price is high and keep the cash for the school fee).			Postal bank County council schools
4. Setting up an individual pasture plot close to homestead	**Short Term (1-5 year)** - Identify an area severely denuded just around homestead because of livestock crowding (most probably at Arabal, Rugus and Kiserian locations), and mobilize the villagers.	Arabal, Rugus, Kiserian	150 HHs	MOARD
	- Set up individual pasture plot at the denuded area, which contribute to soil conservation as well as to raising the price of cattle (This plot is primary aimed at fattening the cattle who is to be auctioned soon).	-do-	-do-	Community
	- Provide the pasture seeds (cost sharing basis).	-do-	-do-	Donors
	Mid Term (5-10 year) - Expand the program to whole study area.	Marigat D.	300 HHs	-do-
	- Explore the possibility of combining agro-forestry technique, tree of which could be utilized for the fence of the pasture land.		150 HHs	MOENR KEFRI
	- Explore the possibility of title deed for the individual pasture plot, which is currently under communal land.			MORS

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	Long Term (11-20 year) - Promote this program in other ASAL areas. - Arrange the title deed for the individual pasture plot.			MOARD MORS
5. Rehabilitation of bare and eroded land	**Short Term (1-5 year)** - Avail necessary material for fence, and grass seeds or tree nurseries.			Donor, NGO
	- Setup a fence around such problem lands found in Eldume and Arabal, and to a lesser extent in Salabani Kimarel so that livestock can be prevented from coming into.	Eldume L. Arabal L. Salabani L. Kimarel L.	10 places	Community
	- Do soil conservation in the land, which is mostly a form of contour ridge in order to retain the scarce rainfall, and then according to the community's need, either grass or trees suitable for firewood shall be planted.	-do-		Community, MOARD
	- Explore the possibility of combining agro-forestry technique.	-do-		MOENR MOARD
	- Try several kinds of fences and find out the most suitable ones.	-do-		MOARD
	Mid Term (6-10 year) - Promote the program in other bare and eroded areas, specially focusing on the catchment areas of Lake Baringo.	Other than above	10 places	-do-
	- Promote agro-forestry program in the rehabilitated land.		20 places	MOARD, MOENR
	Long Term (11-20 year) - Do the same as middle term activities specially focusing on the catchment areas of Lake Baringo.	Lake Baringo CA		-do-
6. Tree planting	**Short Term (1-5 year)** - Promote household tree planting in Marigat Location, starting with the area near KEFRI.	Marigat L.	300 HHs	MOENR, KEFRI
	- Explore the possibility of community forest in line with the above program 5 "Rehabilitation of denuded and eroded land" and/or with blacksmith activities.	Eldume L. Arabal L. Salabani L. Kimarel L.	5 places	MOENR, Community
	- Do research of tree species suitable for ASAL areas.			KEFRI
	- Strengthen the KEFRI capacity.			Donors

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	Mid Term (6-10 year) - Promote the household tree planting in other areas of the Study area, as well as the catchment areas of Lake Baringo.	Study Area		MOENR, KEFRI
	- Try community forest as needs arise.			MOENR, Community
	Long Term (11-20 year) - Do the same as middle term activities specially focusing on the catchment areas of Lake Baringo.	Lake Baringo CA		-do-

6.5.2 Animal Husbandry Development

1） Understandings

1.1） Difficult physical environment

The area is characterized by frequent drought that decimate livestock populations and impoverish the communities. The exact details of the environmental problems and opportunities differ however from area to area.

1.2） Unproductive or low productive livestock population.

The biggest problem of the ASAL area is the huge percentage of unproductive or low productive livestock population. Non-descript male animals unfit for breeding are to be castrated. Among the female population, the unproductivity is mainly due to infertility and sterility.

1.3） Low-income level of farmers

Even without drought, the farmers in the area are generally poor. In case of Arabal, a dire shortage of agricultural lands that can supply the needed cereals is the greatest cause of poverty. In Sandai, the position of one's fan vis-à-vis the main canal and the distance from the water intake to one's farm has a significant factor determining one's wealth or poverty. Thus, except for a small proportion of farmers, the majority is poor. No wonder then, that there is always requests for dip and other services.

1.4） Poor appreciation of the value of innovation propagated by MOARD staff.

The poor appreciation basically stems from the generally low formal education prevalent in the area, as the illiterate cannot even estimate the benefits accruing from dipping – preventing destruction by tick borne diseases, worms etc., lack of knowledge leading to poverty and more missed opportunities.

1.5） A clear shortage of improved livestock (high grade bulls, bucks and rams)

The most commonly seen livestock are the local Small East African Zebu, Small East African Goats and Red Masai x Somali sheep. These breeds, generally, are poor growers and producers of meat and milk. They can withstand drought better, but fail to supply what the farmers need most – good income from sales of live animals (in auction etc.) The low value makes it less profitable to engage in dipping and the general health control.

1.6） Low proceeds from livestock sales.

Livestock marketing in the area is fairly un-organized and usually exploitative of the farmers. Middlemen play an important part in ASAL livestock marketing and the solution is to create a price information system that empowers farmers in their bargainings.

1.7） Inadequate livestock and veterinary extension services.

GOK services have been severely constrained by inadequate transportation, equipment and even laboratories; this inadequacy has led to,

- Perpetuation of ignorance of new innovation, that farmers can take advantage of,
- Late or/and poor diagnosis of livestock diseases,
- Un-needed (preventable livestock death) loss of livestock significantly contributing to poverty,
- Deep-seated dependency syndrome developed from decades of project implementation without a significant community cash contribution. Thus this is what affected the Sandai dip sustainability.

1.8） Poor tools

Poor and inefficient tools result in low output per unit input. Many locally used tools are not well adapted to their purposes.

2） Strategy

From the analysis of the present situation and national policies, a number of possible projects have been identified and prioritized accordingly. The plan draws from results of verification project; number of sources, and convictions. Among them are the followings:

2.1） Improving the flow of livestock information to the farmers. Currently, farmers are generally misinformed about the livestock prices in Mogotio, Nakuru and Nairobi. And as a result farmers sell their livestock at ridiculously low prices.

2.2） The support to institutions that can supply inputs needed for livestock improvement. Main among these is livestock improvement centers (KARI/RRC-Perkerra or Kimose Sheep and Goats Multiplication Center). The only approach that can offer long-term sustainability is one that encourages a significant personal responsibility for an active community participation in livestock improvement. The participation foreseen in this context is one that makes the farmer the center for breed improvement with large multiplication centers supplying superior males. The same philosophy will lead to good care of animals – the backbone of the industry.

2.3） Supporting the community based livestock improvement will be the strengthening of government veterinary and livestock production management services so that animals can be produced and maintained healthy for higher production.

2.4） Increasing the number of market yards where auctions can take place closer to the areas of production. Sandai is particularly disadvantaged as the nearest auction market is Marigat, which is quite a distance away.

2.5) The setting up of a modern abattoir for goats in Marigat. Such an abattoir will serve virtually all of ASAL, Baringo and Marigat being on tarmac, the meat vehicles can supply Nakuru early and easily, and thus make a suitable place for them.

3) Development Plan

3.1) Goats Farming as first priority

Goats are every family's cash account and thus have to be developed so it can play its vote more prominently. Goats' farming is particularly suitable to the area as it is full of grazeable food and dry season fruits. There is a clear development path:

- Supporting the introduction of improved breed males,
- Supporting the custodians (experienced farmers) to breed males for the ordinary farmer by facilitating them to access new blood every couple of years,
- Support livestock management and veterinary extension services, and
- Support to livestock marketing.

In Sandai and similar areas (irrigated crop production areas), dairy goats farming will be also established since there is an abundance of maize leaves and crop residues. However this needs prudent approaches.

3.2) Cattle Farming

When ASAL, Baringo residents want to raise a sizable amount of cash e.g. for secondary school fees, sale of goats hardly suffice. This explains why all pastoralists in the area regard themselves as "cattle people". A livestock development that is silent on cattle is unlikely to receive the needed support by cattle people. Furthermore, bull is more expensive, have a risk of diseases and in most of the dry season, cattle are migrated and very hard to find them. Restricted cattle improvement is therefore prudent. The development path to guide farmers may be the same way as for goat improvement, but they should be cautioned them to produce only crossbred and not purebreds. The breeds of choice here are Boran and Sahiwals both of which can be accessed locally (KARI-Naivasha station and local farmers around Naivasha area).

3.3) Proposed Development Plan

a) Strengthening Extension Services

In the years since the livestock verification project started, MOARD technical staff and the rural farmers have worked with each other in many ways. The general public today has a fairly wide knowledge of scientific matters. Most of the rural farmers are thirsty for knowledge of livestock management.

The team, especially the counterparts, carried out fortnightly on the spot training in general livestock management and animal health care. About 20-30 farmers attended such training every time. Record keeping of livestock production was done and the result was very good records in crossbreeding and management. As a consequence farmers have gained much knowledge since the start of the project. Among the common adopted husbandry practices is castration of excess males.

In summary, the verification project has documented considerable progress in raising contributions towards the acquisition of livestock equipment, crossbreeding, dipping and castration of excess males. The community has changed dramatically and is now seriously de-worming and supplying minerals for their animals. Thus, MOARD staff has had a strong influence on rural livestock development.

Although the study area's villagers have a natural capacity for animal husbandry, the educational level of the rural population is low and their socio-economic conditions are poor. These make the transfer of technology difficult. While the formal education of farmers is restricted, their informal education and experiences are substantial. Therefore, close interaction with the farmers is very important.

Livestock extension brings to the rural people that form of educational assistance best suited to their needs. A service or system that assists farm people, through educational procedures, improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting the social and educational standards of rural life.

To bring the generated technology to the farmers, the following programs should be launched, these are, - technical staff training, livestock fair/exhibition, farmer's tour/conference/workshop, production, competition, forage production mini kits introduction, etc. The project will provide support services to improve the performance of the government's role as a facilitator and regulator of the development activities of the livestock industry in the region.

There is a need for better extension services to improve livestock production. Technical advice will be in the form of the Marigat Veterinary Office to avoid reproductive diseases associated with natural breeding and inbreeding and to control animal diseases. Currently, veterinarians and technical staffs in the field are not of mobile type because of lack of transport. Thus, their services are not fully utilizable/exploitable. If the GOK or donors may set a fund for purchase of motorbikes for vets and their staffs, this will greatly facilitate the extension services throughout the region.

Activities

- Providing the office equipment and transport (a motorbike and fuel)

At present, fully qualified technicians who have undergone training on breeding and feeding are available to carry out extension activities efficiently.

b) Strengthening the Genetic Improvement and Up-grading of the MOARD Goats Breeding Station

The success of goat project will primarily depend on the kind and type of animals used as foundation stock. Upgrading of stock is the cheapest breeding system. It is the mating of a local or relatively unimproved female to a purebred or highly improved buck. It is a fact that local animals (east African Goat) are of poor stature, dressing out at a carcass weight of 15-8 kg, but they could be improved by crossing with a large sturdy breed, which is available from the government breeding station, but numbers are extremely limited. Local breeds have survived with little or no management as far as disease control is concerned. Therefore, it is wise to consider the inclusion of local breeds, partially in any breeding program.

In summary, the verification project has documented considerable progress in crossbreeding. The introduction of improved bucks has shown to be a benefit by the increase in size, higher birth weight, better live weight gains, viability, uniformity and ease of weaning the kids. The community showed much interest in participating in the livestock improvement project in general. The success story of improved bucks has spread far and wide and as a result many farmers in other areas want to buy and introduce such genetically improved bucks even at their own expense.

Particularly, goats on hilly areas did better than those in lowland swamp areas and have less worm infestation. Arabal – a hilly area- is a good goat raising country that can be further developed for improved goat production.

Although the bucks used to produce the offspring in each generation are different, they should mate only to a distinct breed. To minimize inbreeding, mating of relatives should be avoided. In this regards, many different bloodlines should be prepared. Also when selecting animals, it is important to consider the environment that they will have to live in. Many good quality breeds of goats are bred in the temperate parts of the country, and they are not usually suited to ASAL environment due to the climatic conditions and the lack of fodder crops needed for satisfactory performance.

A number of 200-300 genetically superior, high production animals from different bloodlines should be created; and bucks produced from them should be transferred to the farmers. At present, rough estimates, the whole study areas need more than 100 bucks per year.

In order to increase the availability of quality breeds, especially those of goats in the study area, the existing MOARDA's breeding station at KARI-RRC/Perkerra (Baringo district) or Kimose Sheep and Goats Multiplication Center (Koibatec district) should be expanded and strengthened.

Existing stations has limited facilities as well as technical expertise to effectively implement the regulatory aspect of the production of good genetic quality breeding stocks. With the impeding increase in activities, technical assistance in terms of buildings, equipment and training of personnel is needed to accomplish the targeted activities. Particularly in dry season, shortage of the grasses and fodder crops affects the livestock production.

The project is in accordance with the principal thrust areas for development of the livestock sector, particularly goats.

The purpose of the project is to improve and strengthen the capability of the MOARD to carry out the public sector services in the following areas;

1. To increase the productivity of goats in terms of genetic quality and number of animals.
2. To improve the institutional capability/capacity of the MOARD's breeding stations in undertaking R/D activities particularly in the areas of production, reproduction and breeding and to undertake the related training and extension services.

Activities

i) To assist in the establishment of goats improvement networks of ASAL area.

ii) To develop the production capacity of rural animals that conform to the natural condition in the ASAL area.

iii) To improve the genetic quality of goats and introduce new blood lines and purebred goats from other districts.

iv) To establish necessary buildings, facilities and equipment.

c) Establishing Auction Yard in Main Rural Towns

Currently, middlemen or livestock traders exploit farmers. There are no marketing yards (auction yard) in some areas. Meat animals are transported over long distances to large auction market in Marigat. Lack of feed and water enroute to market result in high losses in weight and quality.

Similarly, loading facilities are very poor, resulting in injuries to animals and reduction of quality of meat, hides and skins, etc.

Activities

- Establish regularly operating livestock auction market in the rural main towns. This will encourage livestock farmers to produce good quality animals

d） Establish Veterinary Laboratory in the Marigat Veterinary Office

The ultimate factor limiting productivity of livestock is their genetic potential. However, if other factors such as nutrition, breeding, general management and animal health are ignored, sustainable high productivity improved livestock would not be possible. The risk of animal diseases will automatically increase. In some situation, animal health factor demand a higher place than of breeding and feeding.

ASAL area lies in the tropics, and is characterized by a climate, which is not conductive for livestock raising. In ASAL area, temperature is high, rainfall not evenly distributed as to the need of crops and pasture. This type of climatic condition contributes to poor nutrition and poor productivity of livestock.

There is still a disagreement on issues that which discipline should be given priority during the process of productivity improvement in developing countries. There is, however, a general consensus all over the world, that phenotypic productivity is determined by both the genetic potential of the population and the environment in which the animals are maintained.

The veterinary health sector within the livestock division has not yet been established in the study area. Rapid diagnosis and effective prophylaxis play a crucial role in disease control system, especially in viral diseases for which no treatment is available but which could be controlled through effective vaccination. At present, the disease is confirmed by the Veterinary Investigation Center in Nakuru. In most cases, confirmations are delayed due to long time for the materials to reach the Institute. In some cases, the confirmation is made difficult by the receipt of unsuitable specimens. The non-availability of field diagnostic kits cause delays in concrete and positive diagnosis. Also, the maintenance of cold chain up to the point of vaccination is definitely a serious problem.

Prevention of diseases is not easy, however, it has pay-off in the long run. It is clear that 80 per cent of the disease problems could be avoided by paying a closer attention to the sound basis principle of management, which includes early and timely diagnosis of disease. The knowledge and methods of diagnosis and treatment of diseases among local communities are still limited. The loss in stock numbers, productivity and potential to markets are the result of ineffective disease control and hygiene conditions. Seldom can one diagnose a disease with un-aided eye. One may guess right in the field, but one may also over-look another problem, which is there in invisible form. In such case, only in laboratories where equipment, trained and experienced staff are available round the clock can an effective diagnosis be made.

Activities

- Establishing a well-equipped basic veterinary diagnostic and cold storage (for vaccine) laboratory in Marigat Veterinary Office. It should have an accurate field sample collecting and testing equipment.
- Providing the office with adequate equipment and transport (a motorbike and fuel)
- To establish wide range of disease surveillance and disease forecast information systems.

Also there are incidences of zoonotic diseases that are being handled by the human health division. This responsibility should be transferred to the veterinary livestock health division.

e) Establishing a livestock marketing system with efficient slaughtering and processing facilities.

As a result of the use of improved breeding stock, better animal husbandry practices, intensified veterinary services, injection of capital and the use of agricultural residues and waste, it is to be expected that not only will the total number of goats increase but also that the yield of meat per animal slaughtered will be high. It would therefore be an advisable strategy not to allow the wasteful harvest of slaughter goats to continue, by not permitting present practices. The time will be ripe to evoke an awareness of the need to improve the slaughter handling and processing of goats meat in the study area.

Activities.

- Establishment of efficient market information system and distribute information using posters, radio etc.
- Establish modern slaughterhouse in Marigat with child transport vans . Marigat is on tarmac and carcasses can be transported to Nakuru and Nairobi fast and safe and it create jobs and offer good prices to farmers.

Table 6.5.4 Implementation Schedule of Animal Husbandry Development Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
1. Strengthening livestock Extension Services	**Short term (1-5 years)** - Provide motorbike - Provide office equipment (computer and printer, etc.)	Marigat D.	Visit every Locations 100 days per year	MOARD or Donors
2. Establishing livestock Auction Market (yard) in Rural Main Centers	**Short Term (1-5 years)** - Establish new livestock auction yard	Kampi Ya Samaki L.		Community
	- do-	Sandai L., or Loboi L.		Community
	- do-	Mukutani L.		Community
3. Strengthening the Genetic Improvement and Up-grading of the MOARD Goats Breeding Station	**Short Term (1-5 years)** - Establishing needed buildings and Facilities - Introduce new blood lines and purebred goats from other districts.	Marigat D. or Koibatek D.	KARI supply 100, Kimose supply 200 Improved bucks per year	MOARD or Donors
4. Establish Veterinary Diagnostic Laboratory	**Middle Term (6-10 years)** - Provide needed equipment - Provide motorbike - Establish Disease Forecasting System - Expand more vaccination	Marigat D.		MOARD or Donors
5. Establishing Modern Slaughterhouse and Processing Facilities	**Long Term (11-20 years)** - Establishing modern slaughterhouse and Processing Facilities - Provide Child Transport Van - Establish marketing information system	Marigat D.	Processed 100 Meat goats per day	Communities

6.5.3 Agricultural Development

1） Understanding

About 55 % of the total area are classified into semi-arid zone, where the ratio of annual rainfall to the annual evaporation is from 0.25 to 0.40. The remaining area, about 45 % of the total area belong to the arid area, located in the bottom of the Rift Valley with the said ratio of 0.15 to 0.40. The latter area are almost covered by bare land and suffered from severe soil erosion. According to the results of the PRA as well as the RRA, most farmers suffer from food shortages. The grain self-sufficiency ratio in the Study area is estimated at 43%, which is expected to decrease to 23% after 20 years (refer to Figure 6.5.4).

The cultivated area is covered by only two percent of the total area, while the remaining area, 98% of the total area, is devoted to communal range land for pastoral purpose. These range land are deteriorating year by year by overgrazing. Although 76 % of the cultivated area is irrigated, there is small room to expand the irrigated area because of the limited water resource in such semiarid area. To alleviate food shortage problems many villagers have a desire to construct reservoirs in the existing irrigation areas, including the Perkerra Irrigation Scheme and Sandai Irrigation areas. However, the construction of reservoirs has a problem from the aspect of conservation of water and soils in the semiarid area.

There are complex relationships between production, ecology and tribal society in the Study Area. The decentralization approach is applied to deal with contradictions at the level of the community for project formulation. The land management component was not given a priority in BSAAP, where the framework on land management, range management, soil conservation, forestation and other land management programs was not included. One of the characteristics of the semi arid area is scarce and unstable water supply, where the annual evaporation exceeds the annual rainfall of less than 700 mm to a great extent. The annual rainfall varies year by year from about 300 mm to 900 mm and the monthly rainfall pattern is very erratic. As the crop production is almost impossible without irrigation under the condition, the majority of the people rely on pastoral life. In the drought years like years of 1999 and 2000, the food were hardly supplied and many farmers lost their livestock in these years. However, the verification project on stabilization of

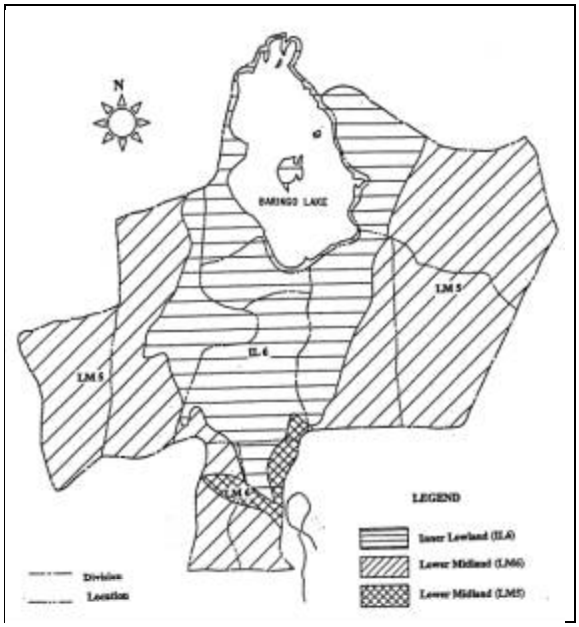


Figure 6.5.4 Agro-ecological Zone

rainfed agriculture, which was conducted in this study from 1999 to 2000, has brought some significant result on the possibility of supplying food even in the semiarid area. The proper soil management shall be incorporated in the land management component to have sustainable agricultural development.

2） Development Strategy

The dam shall not be constructed prior to the implementation of watershed management for the proposed reservoir because the water and land in the Baringo Lake basin is exploited to the limit without conservation. For the time being, the exploitation of water resources has to be stopped and for instance water saved irrigated agriculture and the stabilization of rainfed agriculture shall be promoted in the Study Area. Another verification project on the water-saved irrigated agriculture has proved that water saving is possible by applying land leveling. In fact the irrigation labor was decreased and crop yield was raised due to uniform and efficient water supply to each hill. With the result of the said verification projects, following three items are proposed as the agricultural development strategies;

- Prior to easy exploitation of water resources by construction of dams, the proper measures shall be undertaken to utilize the water effectively, for instance through water saving in the irrigated area and stabilizing rainfed agriculture.
- It is important to turn to sustainable agricultural development from destructive land use of overgrazing in the communal land.
- At least the homestead and the surrounding land shall be privatized for sustainable and intensive land use.

3） Development Plan

To raise the self-sufficiency ratio of food security as well as farm income, the following interventions are proposed;

- Land registration on all lands except for communal range land.
- Water-saved irrigated agriculture including on-farm water management, land leveling and improvement of farming practices with high-value crops such as tomato, watermelon sweet melons, sweet typed chili, and eggplants.
- Stabilization of rainfed agriculture through harvesting rainwater and diversification of crops from single cropping of maize to mixed cropping in the rainfed area.
- Social forestry development with establishment of agro-forestry at village level as well as at homesteads.
- Pasture development with rainwater harvesting.
- Strengthening of research activities on the semi-arid agriculture at Regional Research Center, Perkerra

The related programs shall be applied according to the agro-ecological zone (refer to Figure 6.5.5).

3.1） Land Registration

The existing land tenure system in ASAL area, namely the communal land, has a tendency to bring about problems such as lack of motivation in land conservation and no access to loans, although the communal lands has a crucial function which is to allow the people to graze their animals free in a wide area. It is observed that people's interests in communal and individual lands are different, as the soil erosion is prevailing in the communal lands, while the private lands are fenced against animals and conserved well by the owners. As for the loan status, Agriculture Finance Cooperation in Kabarnet has not given any loan to those who reside in the Study Area due to lack of collaterals, namely no land title.

Notwithstanding the sharp controversy on communal and individual interests on land tenure system in ASAL areas, gradual individualization of land tenure (land registration) is suggested for certain areas to remove the negative effects of the communal lands. It is proposed to demarcate the entire cultivated and homestead lands from the communal lands by issuing title deeds. The homestead may include surrounding land, which could be developed into individual pasture or agro-forestry land. The proposed land registration area will cover about 2,490 ha (6,160 acres) of the whole cultivated area, and 4,980 ha (12,300 acres) of homesteads and the surrounding area. The method of land registration is planned, referring to the on going operation for the irrigated area in Loboi location.

In the Loboi area, land registration work includes issuance of title deeds for the whole irrigation area. The farmers intend to have title deeds for most of their irrigation areas. Actually there are many young generation farmers who want to change the land tenure system from communal to private land. In Loboi area, Land Registration Office has been conducting a survey to make a cadastral map. Based on the map, the land is registered with some charge.

The individualization of land tenure system needs to pay special attention on getting consensus among the communal society members. Also issuing adequate policies should be made to avoid potential conflicts between individual and communal rights and interests by the concerned authorities. The policies should take authorities to deal with the ownership on the lands, which have ever been used as communal grazing lands, and to arbitrate among people who claim title to the same piece of land.

Land registration in the short, mid and long term will be carried out, respectively in the areas of Sandai, Loboi, Kapukuikui, and other locations in Marigat and Mukutani divisions. It is proposed that the capability of the land registration office in Marigat division shall be expanded.

3.2） Water-Saved Irrigated Agriculture

Crop production can be increased with timely and equitable water distribution of the limited water between upstream and downstream in the existing irrigation area. For this purpose water management improvement is proposed as described in 6.8 Agricultural and Rural/Social Infrastructure Development. In the water management improvement area, trials on land leveling and improvement of farming practices are proposed to hold for high-value crops, for instance fruit-like vegetables such as tomatoes, watermelons, sweet melons, sweet typed chili and eggplants, bitter guard and sweet-corn. Under conditions that the water resources are very limited in the semi-arid area, the land leveling is very effective in raising on-farm irrigation efficiency. The result of verification project on the water-saved agriculture shows that the land leveling generate the benefit of water saving as well as raising of crop yields by 30 % (refer to Figure 6.5.6).

Though many farmers learn about the necessity of water saved irrigated agriculture by applying land leveling, the result of the verification project has a problem in a factor of cost effectiveness. The verification project site is only in 3.6 h, which is scattered at three locations. The land leveling costs is 5,200 Ksh per acre, which are equivalent to two times the lost of custom based plowing. The high cost is derived from three factors; the higher transportation cost of tractor and leveler for long distance from Marigat town to the site, the large size of leveler which is suited to level such large scaled land as seen in the USA and scattered locations. There are oxen driven levelers in India. It may be worth to make a trial to introduce such light typed leveler as the Indian type to decrease the leveling cost. Although any animal is not yet used in the Study area, there will be a possibility to introduce animal use as seen in the Kitui area (see Figure 6.5.6).

Water saved agriculture in the short, mid and long term will be carried out respectively in the areas of Sandai, Loboi and Kapukuikui, in other irrigation areas.

3.3） Stabilization of Rainfed Agriculture(Rainwater Harvesting)

According to the results of the PRA and RRA, many farmers are discouraged to practice rainfed agriculture. There is, however, a significant number of farmers who are engaged in rainfed agriculture in areas such as upper Mukutani and Kimalel where the water sources for irrigation are not available. One time, rainwater harvesting from external catchment was demonstrated under the BSAAP in the Study area. However, it failed to introduce sustainable technology. One of the possible reason for the failure is less involvement of government staffs and farmers in the project, where the practical technology was to introduce in term of effectiveness in rainwater harvesting and water and soil conservation.

In this master plan study, the verification project tried to develop a practical and sustainable, rainwater harvesting farming system with implementation of verification projects. By nature, the common rainwater harvesting system is not applicable anywhere

because the conditions of rainwater harvesting are varied from area by area. However, the verification project has two types of structures, namely the main/ lateral diversion channels for the rainwater harvesting from the external catchment and Funya Juu terraces in the cultivation land. Various kinds of drought tolerant crops and varieties were almost successfully introduced as described in the latter, including short maturing drought tolerant types of maize, finger millet, sorghum and various pulses like cowpea, green gram and pigeonpea (Refer to Figure 6.5.7).

It is observed that many farmers imitate the rainwater harvesting system in the vicinity areas of three verification sites. It does not mean for the individual farmers to develop the same kind of rainfed agriculture system in the verification project, because there is the limits of ability for individual farmer. However, smaller scaled systems are likely to be applicable for the farmers, where a due coordination is required for efficient and equitable allocation of water resource among systems.

Rainwater harvesting during the short, mid and long term will be made respectively in the area of Arabal, upper Mukutani, Kimalel and Kiserian locations and in the remaining areas of the Study Area.

3.4） Pasture Development with Tree Planting

Pasture improvement is promoted in the Study Area by the NGO of “Rehabilitation of Arid Environments (RAE)”, applying methods of establishing pastures with indigenous grasses Cenchrus Ciliaris and others in the denuded barren land. This pasture improvement will contribute not only to increasing animal fodder but also to conserving water and land indirectly. This pasture development shall incorporate with rain water harvesting system, according to the result of farmer’s trial in Marigat location, which is assisted by Agricultural Office of Marigat Division. The tree planting may have dual purposes of browsing for feeding and suppressing evaporation for maintenance of soil moisture. The pasture development shall be further expanded in the demarcated area. At least three acres shall be demarcated per household for the homestead including the surrounding area. Pasture development will be made using planting pasture grasses and browsing trees in the homestead or the surrounding area during short, mid and long terms, in the areas of Ngambo location in Marigat division and Mukutani division, respectively.

3.5） Social Forestry Development

According to the results of the RRA and PRA, there are many farmers who are aware of the necessity of reforestation. Some farmers already plant various trees, indigenous firewood, fodder trees and fruit trees in barren land. The dry barren land could be converted to agro-forestry with improved pasture under planted trees. In Ngambo location, about 12 acres (5 ha) of community forest were successfully established by the villagers, who planted Prosopis Juliflora in the barren land of the “Inner Lowland 6”.

The Kenya Forestry Research Institute (KEFRI), Marigat are engaged in activities to identify suitable kinds of trees in the semi arid area during the Study period. Such technology for the propagation of specific trees, land preparation and water harvesting under the semi arid condition has been established by the Social Forestry Extension Model Project (SOFTEM), assisted by JICA. This kind of tree planting will be promoted in the Study area. As same as in the above, said pasture development the forestry development shall incorporate rainwater harvesting. There are a considerable numbers of promising species (for instance, Prosopis juniflora, Acacia nirotica, Azadirachta, Balanites eagyptiaca, Melia volkensi and Molinga oleifera) of trees to be planted in Study Area. However, it is required to further examine the adaptability of these species in the Study Area (Refer to Appendix I, Table I.4-6)

Social forestry development shall be carried out during the medium to long term in Marigat and during the short to long term development, in Marigat and Mukutani divisions.

3.6） Rehabilitation of Range Land

There are 34,500 ha (85,400acres) of range land in the Study Area. Most of this range land has deteriorated due to overgrazing and soil erosion. Therefore there is a need to rehabilitate the deteriorated range land through soil conservation and rotational grazing. This rehabilitation scheme will be carried out by enclosing the land, restricting livestock numbers, removing unwanted bush and planting of suitable trees. The grazing management in range land shall be made by the community and enforced by a council of elders where land ownership is communal. The rehabilitation of range land during the medium to long term will be carried out in Marigat and Mukutani divisions, respectively. The range rehabilitation shall go hand-in hand with the said pasture development.

3.7） Strengthening of the Regional Research Center, Perkerra

It is proposed that the following equipment be installed at the Regional Research Center of the Kenya Agricultural Research Institute, Perkerra, in order to strengthen semi-arid agricultural research.

- Meteorological equipment
- Soil and plant analysis laboratory equipment
- Audio-visual aid and office equipment

The research activities on semi arid agricultural development have to be strengthened because little data are available on that matter. For instance in the possibility of pasture development and reforestation in the denuded barren land any related basic data are hardly obtained. It is proposed to distribute above development plan in each sub area in the Study Area, according to the respective direction of development in each area (Refer to Appendix I, Table I.4-5).

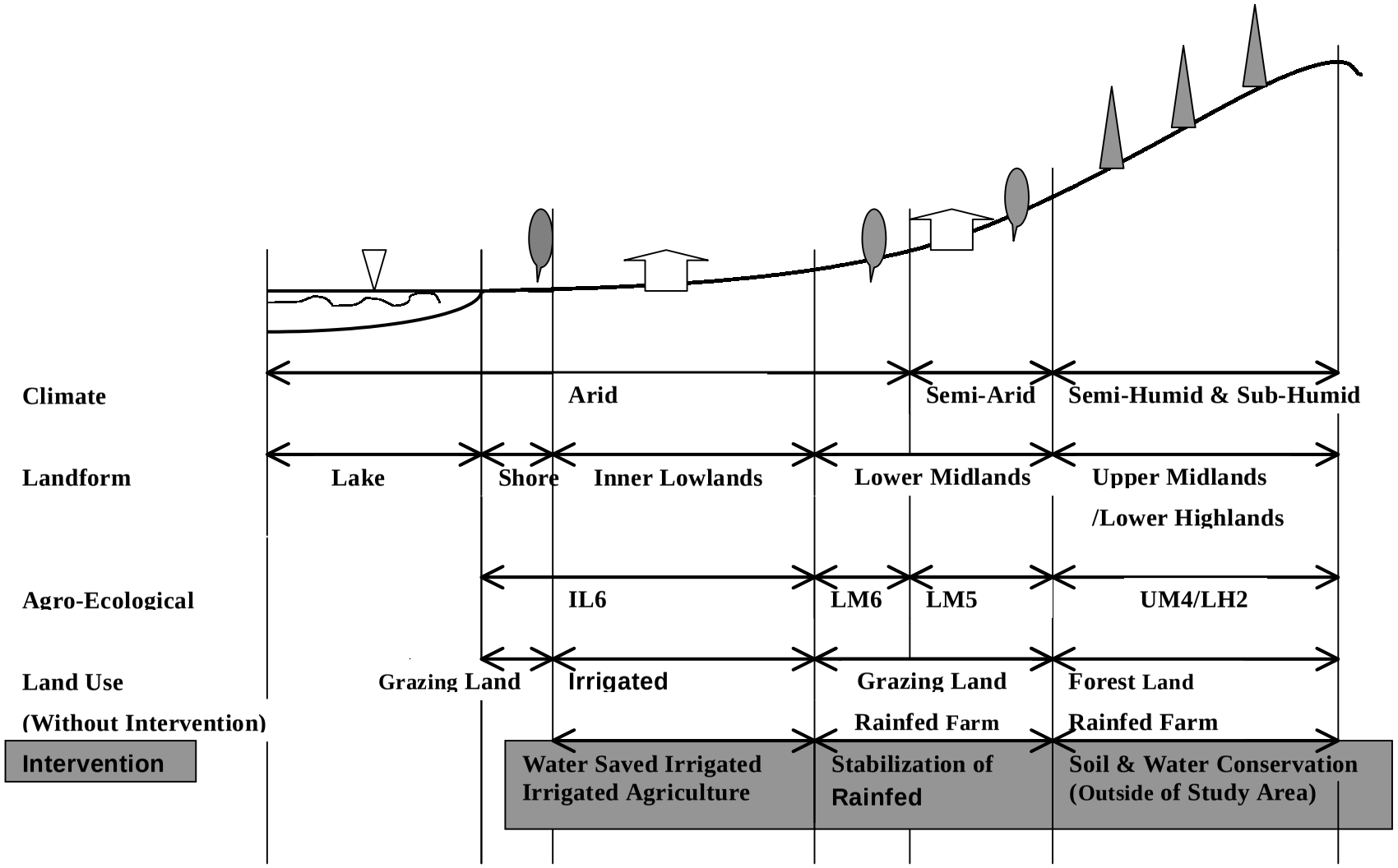


Figure 6.5.5 Development Concept by Agro-ecological Zone

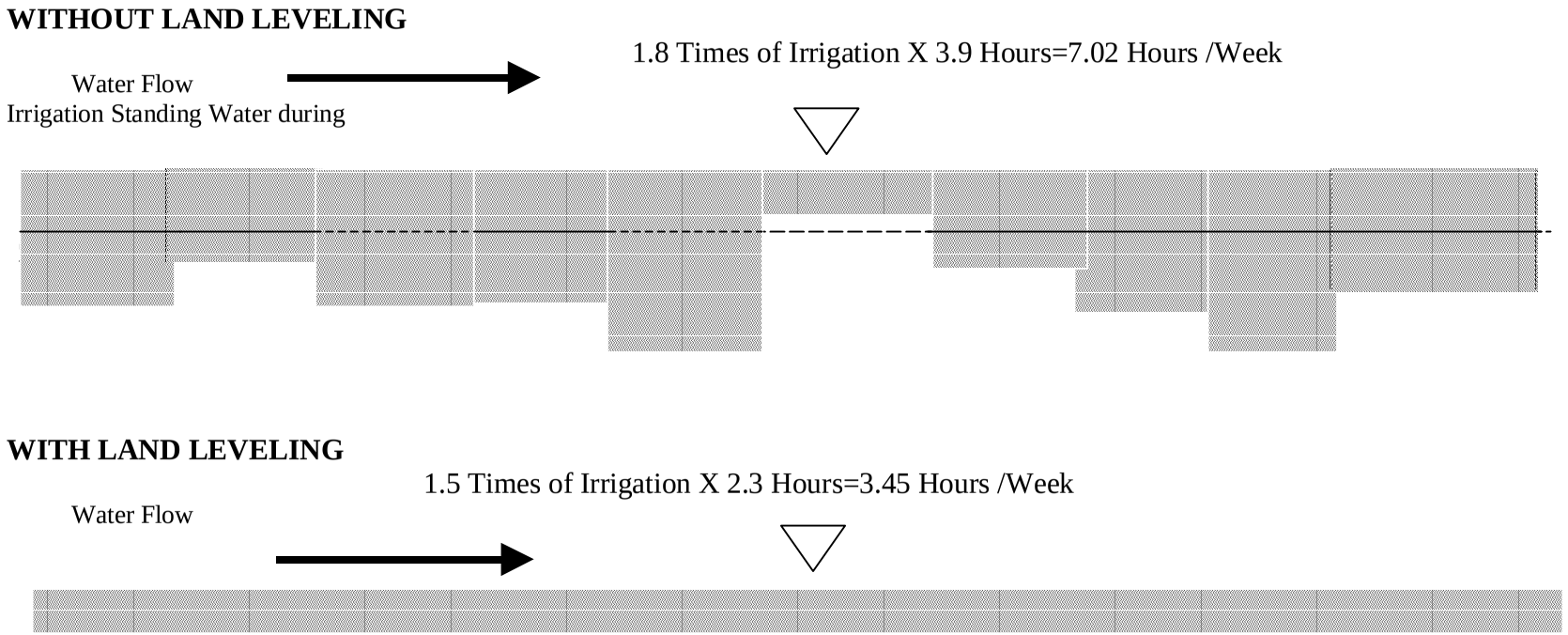


Figure 6.5.6 Labor Reduction by Land Leveling

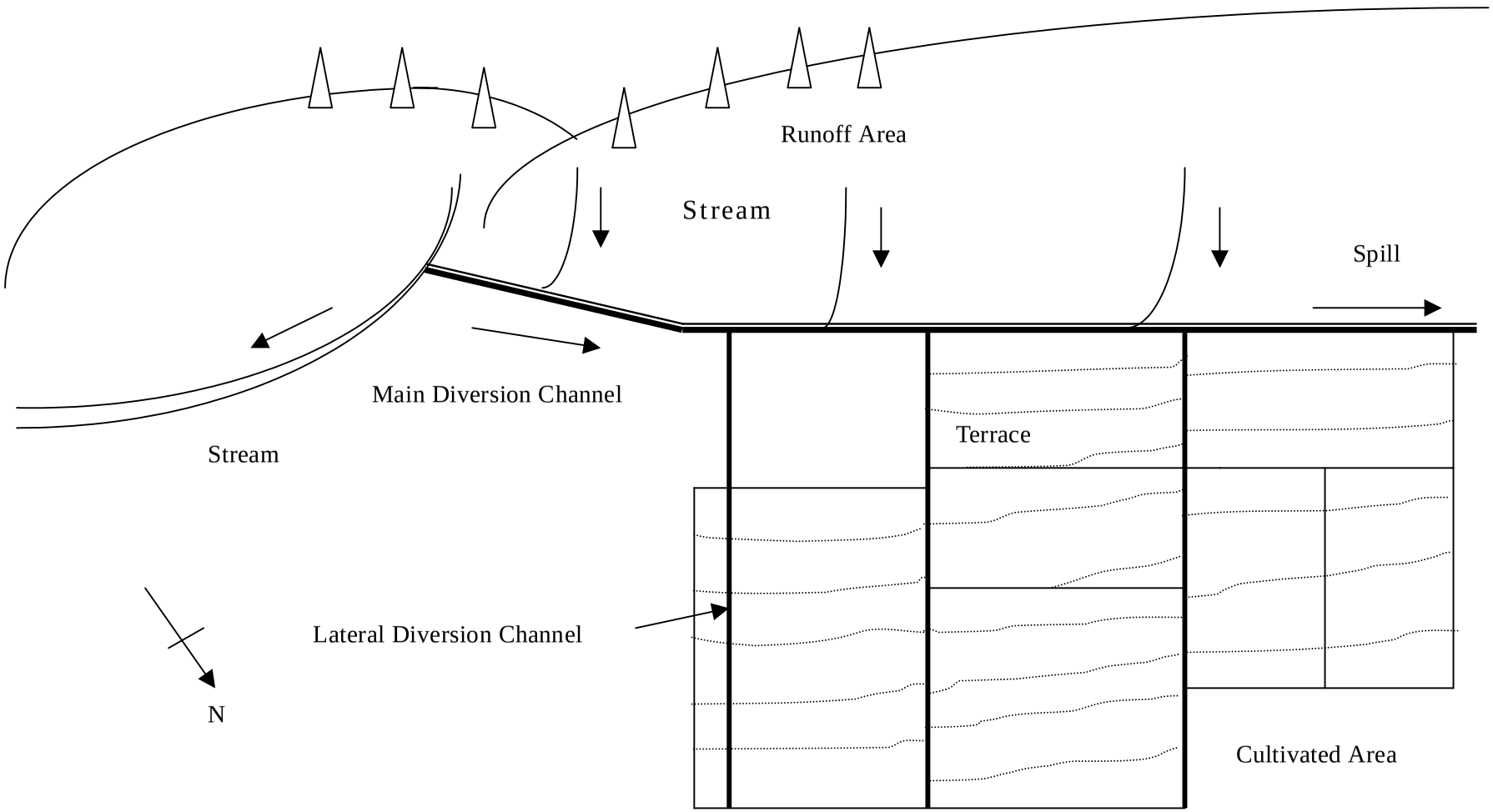


Figure 6.5.7 Layout of Rainfed Agriculture in Partalo Sub-location

Table 6.5.5 Implementation Schedule of Agricultural Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
1. Land registration	**Short Term (1-5 years)** - Strengthen land registration office	Marigat and Mukutani Divisions		MLR Land Registration Office
	- Register cultivated land and homestead inclusive surrounding areas	Sandai, Loboi and Kapukuikui L.	1,430 ha (24% of target area)	-do-
	Mid Term (6-10 years) - Register cultivated land and homestead inclusive surrounding areas in other locations(harf area)	-do-	2,390 ha (38%)	-do-
	Long Term (11-20 years) - Register cultivated land and homestead inclusive surrounding areas in other locations(half area)		2,3900 ha(38%)	-do-
2. Water-saved irrigated agriculture	**Short Term (1-5 years)** - Increase on-farm irrigation efficiency with land leveling			MOARD/ Community
	- Apply improved farming practices with crop diversification	Sandai L.	18 ha (1% of irrigated area)	
	Mid Term (6-10 years) - Do the same program in other irrigated area in Marigat Division	Sandai L, Loboi L., Kapkuikui L.,	1,610 ha (85%)	-do-
	Long Term (11-20 years) - Do the same program in irrigated area in Mukutani Division	Mukutani D.	275 ha (14%)	-do-
3. Rainwater Harvesting	**Short Term (1-5 years)** - Stabilize rainfed agriculture with diversion of run-off water and development of Funya Juu terraces	Araval L. Kimalel	65 ha (11% of rainfed area)	MOARD/ Community
	- Introduction of short maturing drought tolerant crops and varieties			
	Mid Term (6-10 years) - Do the same as mid term activities whenever new pan is constructed and/or any rehabilitation work of existing pan is done.	Arabal D Kimalel L.,Mukutani L.,Marigat L.	313 ha (53%)	-do-
	Long Term (11-20 years) - Do the same as mid term activities whenever new pan is constructed and/or any rehabilitation work of existing pan is done.	Mukutani D.	210 ha (38%)	-do-

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
4. Pasture development with tree planting	**Short Term (1-5 years)** - Development of pasture land with rainwater harvesting - Planting trees in the pasture land	Marigat L.	150 ha (1% of irrigated area)	MOARD/ NGO/ Community
	Mid Term (6-10 years) - Do the same program in other irrigated area in Marigat Division	Other L. in Marigat D.	5,680 ha (85%)	-do-
	Long Term (11-20 years) - Do the same program in irrigated area in Mukutani Division	Mukutani D.	1,010 ha (14%)	-do-
5. Social Forestry Development	**Mid Term (6-10 years)** - Organize farmers' group of Social Development Project - Establish village nursery - Plant trees	Marigat D.	1,940ha (79%)	MONRE/ Community
	Long Term (11-20 years) - Do the same program in irrigated area in Mukutani Division	Mukutani D.	530 ha (21%)	-do-
6. Rehabilitation of Range Land	**Mid Term(6-10Years)** - Rotate grazing land - Demarcate land adjacent to homestead - Restrict livestock number - Coservation browsing trees - Soil and water conservation	Marigat D		Land Registration Office
	Long Term (11-20 years) - Do the same program in other division	-do-	2,390 ha (38%)	-do-
7. Strengthening of Regional Research center, Perkerra	**Short Term (1-5 years)** - Strengthen the Regional Research center, Perkerra through installing basic research equipment of meteorological observation, soil and plant analysis, and office /audio visual.	Marigat	Perkerra station	MOARD/ Donors

6.5.4 Small-Scale Industry Development

1） Understandings

The importance of small-scale industry was felt in the Study Area where resources for major livelihood activities are limited, due to the difficult environmental conditions that resulted from scant and erratic rainfall and limited pasture land. The condition is getting worse year by year because of population and livestock pressure. When drought comes, grass for grazing becomes scarce and people may lose their livestock, or it leads to low crop production. Therefore, they have been trying to look for alternative sources of food or income, knowing that drought could come anytime. Under such circumstances, it is required to diversify people's way of living in order to survive in the area, and promotion of small-scale industry could be one of the options for it.

Besides livestock keeping and farming, income generating activities seen in the area with good potential are; bee keeping, fishing and its processing, trading, handicraft making, kiosk or other shops management, tourism, skin and hides processing, ballast making, aloe extraction and other small-scale businesses. However, these activities are not fully developed yet. Major problems and constraints that limit improvement of small-scale rural industry in the area are; 1) poor marketing system, 2) insufficient knowledge and techniques, 3) lack of political support, 4) weak organization, and 5) inaccessibility to credit.

In spite of having nice tarmac roads and a quite number of Matatu coming and going, which bring people to big towns such as Nakuru and Nairobi easily, not many resources or information from outside goes to the area nor people in the area reach to the outside world. Mainly, only middlemen connect between them. Most of the products produced in the area are marketed by the middlemen, without processing, and then raw or semi-processed their products are exchanged at relatively low prices.

Insufficient knowledge and techniques make it difficult to produce value added or processed products. People in the area are eager to improve their skill, but its chances are limited. Marigat has Youth Polytechnics, but their courses are not good enough to meet the demand in terms of number of accommodated people and contents, and high tuition fee is also a burden to the community. Technical support from the government staff is not reliable due to insufficient number of staff and budget which makes extension staff traveling in the area difficult.

Although the Study Area has registered 127 women's group and 74 youth groups, only a small number are functioning actively. The area used to have a large scale honey refinery in Kibingor operated by the Mogoswok Beekeepers Co-operative Society, which consisted of more than one thousand members, but the factory was closed due to misuse of money by the committee members.

Inaccessibility to credit is another constraint in the area. Though there are NGOs to provide loan service, number of beneficiaries are limited. As for other credit services such as commercial bank, access is only to a limited number of people in the area since many of them do not have any things to mortgage required in order to receive a loan.

According to the PRA survey conducted in 1999, participants of four communities indicated that low income and lack of alternative sources of livelihood are the major problems. During the course of PCM workshop held in the same year, participants expressed the problems of their products with low prices resulting from low quality and difficulty of market their products. It was recognized that the people in the Study Area have felt the importance and needs of improving their small-scale industry. Based on their needs and present condition of the area, development plan of small-scale industry is proposed as follows.

2） Development Plan

Due to the limited resources and fragile environment that they have, it should be considered that the industries to be developed or improved in the area are well balanced with other industries and to utilize existing resources effectively. In this regard, they should be small-scale, rather than the large-scale that requires heavy input and brings industrial waste, which might become a cause of disruption of the environment. In addition to that, it is preferable to promote more than one industry at one place to diversify income sources as a countermeasure for erratic climate condition and unreliable resources. During the drought years, it is indispensable to have alternative income sources, which are resistant to dry condition, to supplement other depressed activities in such years.

The area has or used to have large-scale organizations such as Mogoswolk Co-operative Society and Marigat Co-operative Society, but none of them are operating well. When income-generating activity starts and its benefit has to be shared among the group members, its management and distribution are not easy. In the case of verification project at Kampi ya Samaki, such difficulties were not found even though the number of registered members was expanded up to 401, thanks to the longer period to build a trust as well as leadership/management capability of committee members. However, the size of the organized groups should not be too big, so that money flow would be kept transparent and all the members know and trust each other.

The scale for the initial input is another issue to be considered. In the case of verification project, the women's group had waited for 18 months after they can realized the first benefit in terms of cash money due to delay in building construction and business preparation. However, the benefit could have been recognized at the earlier stage if they could have started from small-scale, though the benefit would be also small. In such way, incentives to continue following activities would be recognized. Rather than starting from a large scale, small scale is good to start, so that the capacity of the group will be built up

step by step, and early benefit recognition helps a group to continue their activities.

While the fundamental resources for the major activities such as water, fertile soil, and vegetation are limited, still the area has specialized resources during dry area, but not used in full extent, such as honey, traditional handicraft and skin/hides. These existing local resources could be exploited and processed in a simple manner, instead of importing materials from the outside and spending more on transportation fee. The most important consideration before the planning of the industry development is to understand what and how much of resources people in the area have and can utilize.

If there is a highly motivated group from existing ones and its members fully understand the responsibility of the project implementation, it could be the target group. On the other hand, newly established group, which will be organized with the interested members after identifying future vision of the group, should be more promising as the target group to undertake full participation and sustainable activities.

After identifying the industry to be developed together with the community, technical as well as capacity building trainings are required. Training course should be basically selected by the target group instead of the provision of already prepared curriculum. After the training course, continuous, but ad-hoc type of on-the-job training is indispensable to follow up the issues. It may not be expected to receive full-support from the government staff due to insufficient number of staff, lack of budget and transportation means. However, intermittent and long-term support provides people with some chances of try and error, and additional support at the right timing helps them remember and practice the obtained knowledge.

During the implementation of the verification projects, people in the Study Area experienced the inter-location monitoring tour to learn from others and to exchange their experiences. Through this experience, their relationship among different communities could be cultivated, and especially for those who had less chance to visit outside of the area before it was quite striking and a good chance to know outside of their world as well as to appreciate themselves objectively.

Based on the created relationship among communities, network system could be established to circulate marketing and other information and to transport and mobilize their products, therefore existing resources could be utilized more effectively and production cost would be reduced. For example, harvested crude honey is collected at the center point where it is processed and bottled, information on marketable handicraft is passed through the network to meet the demand, or materials for handicraft are procured in a big scale to reduce transportation cost and are distributed to the women with cheaper price.

The Muungano Women's Group, which was organized to construct a multi-purpose

building and promote businesses in Kampi ya Samaki area, had a good record of repayment compared with the groups from other verification sites. In the record keeping for livestock management, women were more responsible than men. It might be said that 1) women have less chance to participate in the assisted development activities and they are serious in making full use of the opportunity, 2) women are more responsible and with high loan repayment compared with men, and 3) women are mostly based at the place of residence while some men in the area are engaged in livestock keeping and are not attached with the residential area throughout the year. Therefore, women's group might be easier to work with, or at least women should be involved in the committee members to keep the activities going on smoothly. On the other hand, women are more attached to their home and busy on housework. To avoid bringing domestic problems, it is recommended to introduce the activity that does not interfere with the housework perfunctory.

2.1) Program 1: Promotion of Honey Business

Honey is the product with high potential in the ASAL areas. Demand of honey is high in Kenya, but supply is not enough and the Country is even importing some amount at present. Though the potential for production increase is high in the Study Area where many acacia trees are grown, the resource has not fully been utilized due to insufficient supply of beehives, lack of technical support and under developed marketing system.

Though production of honey depends on the flowering stages of the year and water availability, rainfall influence to the production is less compared to crop production and livestock. Beekeeping and refining honey could support a stabilized livelihood of the people in the Study Area (see Figure 6.5.8).

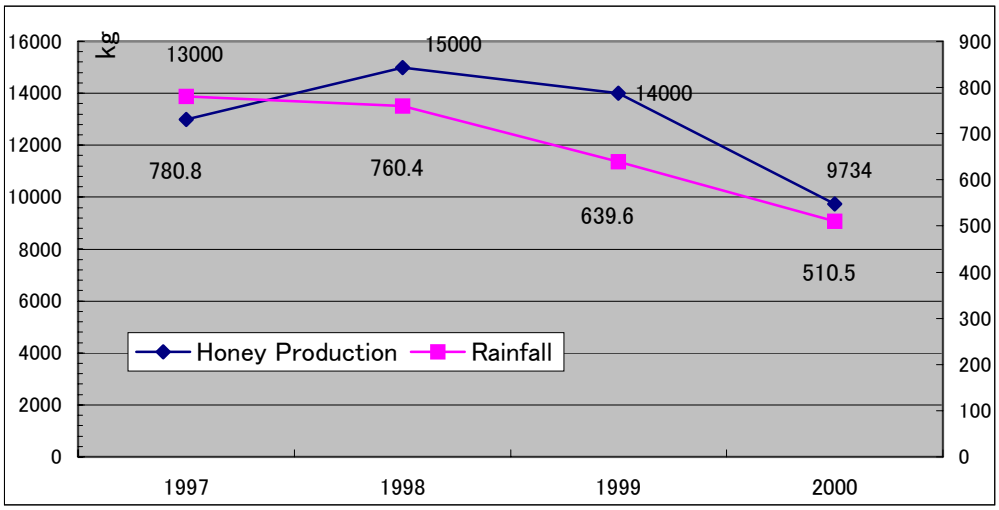


Figure 6.5.8 Relationship between Rainfall and Honey

At present, most of the crude honey produced in the area is sold to middlemen individually or in a group basis without processing. Semi-refined and packed honey in empty whisky

bottles are sold on the road side, and the benefit from honey business is still low. It is recommended to market their value added products directly to customers in the area where there are many tourists around Baringo and Bogoria Lake and town center such as Marigat. Marketing to the big cities would be considered and it should keep pace with the promotion of beekeeping.

One of the verification projects implemented in Kampi ya Samaki showed the sign of good demand of bottled honey. The women's group purchased plastic bottles and label seal from Nairobi, and labels were printed at one of the NGOs' office operating in Marigat. Foreigners as well as residents showed interest on pure honey.

For their future activities, quality/quantity control and marketing are the major issue to be examined. Crude honey is not available throughout the year, and price fluctuates; cheaper in August/September and November/December during harvest time, while relatively expensive in January and February. After setting their target production based on the demand, the timing of purchasing of crude honey should be considered.

While honey is refined and sold at the shop in Kampi ya Samaki, beekeeping could be also promoted in the area to prepare for future expansion of market. At present, most of beehives seen in the area are traditional log hives. Though the improve type of beehive called KTBH (Kenya Top Bar Hive) was introduced in 1989, they were not adopted in the area since they contain heat inside and bees did not settle down. Considering the climatic condition in the area and availability, traditional log hive is more appropriate. For the people of low income or women, it is recommended to purchase hives in a group base. The areas with high potential of production expansion are Arabal, Marigat, Loboi, Sandai, Kapkuikui and Kimarel location.

The women's group had been trying to market their products to tourist hotels in the area and supermarket in Kabarnet, as of September 2001. After ensuring the collective number of bottles, their target could be the supermarkets in bigger towns such as Nakuru and Nairobi. Searching for bigger market will be covered by the committee members of honey business and Muungano women's group with the assistance divisional officers. Livestock department could support existing group to purchase log hives, provide technical advice of beekeeping, and link those honey producers and refining group in Kampi ya Samaki.

In the future, more collecting points of crude honey could be developed to expand the benefit of honey business to larger area, to restrain the group from becoming corpulence and to be ready for bigger market. Kapkuikui: another tourist place, and Marigat town: a hub center of all the locations and the roads to outside town/city start from, are the recommendable places to set up more refinery or small-scale multi-purpose building. Materials are purchased all together from outside to reduce production cost, and collected

crude honey could be refined, bottled, packed and labeled under the same brand of Kampi ya Samaki to keep up with the outside market. Quality control should be carefully considered in such case, so trained quality controller should go around. Since honey smell or taste differs depending on harvested places, different version of honey could be packed to have variety.

Candle is also produced using bee-wax, which remains after refining honey, and they could be sold at handicraft shops. The training for candle making was already provided through the verification project to the women's group of Kampi ya Samaki. The techniques could be developed first at Kampi ya Samaki, and produced candles are sold at their shop. After ensuring market preference, the techniques are extended to other shops. Home Economic Officer of Marigat could provide technical support.

To develop honey business in this area, networking to supply crude honey, procurement of materials and marketing is significant to reduce production cost, and government staff could support to circulate information from place to place.

2.2） Program 2: Handicraft Promotion

There are many women making handicrafts such as bags, belts, accessories, mattress and others using sisal, beads and leather that are mostly brought from outside of the area. They are sold locally or to buyers, but demand is not so high, even though the area has many visitors thanks to the tourist resources of Lake Baringo and Lake Bogoria.

It is recommended to improve the quality of their handicrafts, in order to attract tourists. It will help women, who have limited access to land and livestock in the area, to have cash income, to control their own resources and to enhance self-confidence. Though women are more attached to their household compared to men and are not welcomed by their husbands to be away from home for many hours, they could make handicraft while they graze livestock or take care of their children at home. At the same time, the benefit borne from the handicraft will expand to her family members including children.

Provision of the study tour to learn market-oriented strategy and technical training based on the market needs is recommended to start with. The participants of the tour will be selected by the target community as their representative. Since the chance is limited for women to see outside of the area, the tour would become an eye-opener to shift their minds from self-centered to market-oriented thinking. After sharing their experience with other members, the way of promoting handicraft will be discussed and planned among the group members.

Evaluation of the existing resources will be the first item to be discussed within the group. During the course of the verification project implementation at Kampi ya Samaki, women took training course on handicraft marketing and technical skill-up. They realized the

value of their traditional products rather than the same commodities easily found in other places. In addition to that, their problem was the high cost of products compared with the ones in big city due to the transportation cost for the materials procured from outside. Utilization of the local resources, which makes the production cost lower and also creates unique taste in the area, should be considered. Technical training could be supplied to the target group to improve their skill as well as the basic rules such as keeping products hygienically. Training courses and trainers will be selected by participants from the provided alternatives.

As to the material procurement, it should be organized in a group base rather than the individual base to reduce the cost. Produced handicrafts could be sold in the shop of the multi-purpose building constructed through the verification project. In addition to the existing Muungano Women's Group, the interested women's groups will play the role to establish networking to disseminate marketing information such as price of materials, popular products, high season of tourists, etc. These networks covering the whole Study Area help women to utilize their resources fully and to obtain the maximum benefit. If more multi-purpose buildings are constructed in Marigat and Kapkuikui, products could be sold there.

2.3） Program 3: Utilization of Fish Resource

Many active women frying and selling fish are found at Kampi ya Samaki. They fry or smoke fish and sell them locally or transport to Nakuru or other places to market. Though fish is a limited resource at Lake Baringo, it plays a significant role in the area as one of the income generating activities to stabilize people's livelihood.

As seen in the figure below, fish production from Lake Baringo was high during drought years between 1999 (410 t, the Lake was closed in August due to over-fishing) and 2000 (456 t) compared with the previous year (375 t). During this time, people including for those without fish license had caught fish to obtain supplemental diet and income. Fish is one of the alternative sources to stabilize people's livelihood during drought years. On the other hand, the production becomes low in year 2001 due to over fishing in year 2000, and women in Kamipi ya Samaki were claiming the problem of insufficient fish supply to source their income.

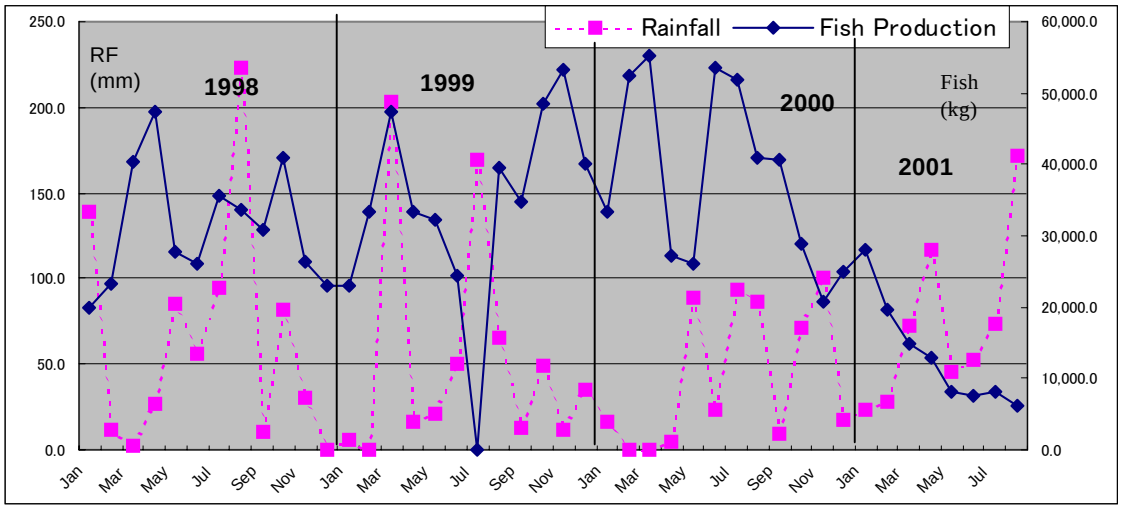


Figure 6.5.9 Relationship between Rainfall and Fish Production

Because of the unreliable and limited resource, it is not recommended to develop/promote fish business to a certain extent, but only extended to an individual base to diversify people's income generating activity. However, reduction of production cost could be considered by shifting cooking place from three-stone to modified type of improved Jiko for commercial use. Since many women engaged in fish frying are buying firewood at present, it will help them to use efficient type of stove to reduce production cost.

2.4） Program 4: Market Improvement of Skin and Hides

Since many livestock are slaughtered every day in the area, skin and hides are also produced daily in the Study Area. Butchers buy livestock from the people around or at auction. Skin and hides are separated from meat, and they are brought to "banda" or skin house where they are suspended and dried under roof. Naturally dried skin and hides are sold to middlemen when they come; otherwise they will just wait for them. The price of skin and hides has been decreasing due to market collapse and middlemen hardly come recently. Therefore, it is recommended to bring suspended and dried skin and hides to the tannery in Nakuru where they can sell their products at higher prices. It should be easy to organize butchers to market their products together since some of them have formed a group to construct banda.

On the other hand, about 20% of animals are slaughtered for domestic consumption, and in such case, skin is dried on the ground under the sun, which makes the leather quality poor. If the recovery of leather market is recognized, it could be considered to construct a banda by community members to improve quality of skin and hides. These semi-processed skin and hides could be brought to the tannery.

When we consider the fragile environment in the Study Area with limited water resources and all river water dead-end at Baringo Lake, any industry development that leads to water

quality degradation must be avoided. However, request for the tannery establishment was raised during the interview with local people as well as the government officers. It would support to create job opportunity for the people in the area and also will bring benefit for those who are making handicrafts. Establishment of small-scale tannery could be considered with the great consideration on the impact to the environment. Basically, chemicals should not be used to tan the hides. Instead of that, wattle tree, which are grown in the dry area, could be utilized. However, once wattle trees are planted, they easily invade to other areas and expanded year by year even to the farming or grazing land. Therefore, proper management of the plot is required, such as avoiding burning in the field and cultivating trees from the outer edge to keep it outside. Establishment of tannery is considered as a long-term development plan, since it requires further study on site planning, water availability, technical information, environmental assessment, etc.

2.5） Program 5: Establishment of Multi-Purpose Building

Kampi ya Samaki area experienced the verification project of small-scale industry; construction of multi-purpose building and promotion of three businesses, namely, honey, handicraft and restaurant. Since the formation of the united women's group absorbing eighteen affiliated women's groups, they had been making effort to attain their target together as a cohesive group. In addition to that, they had become more self-assured and initiated their own development activities, based on their future vision discussed in the group.

The experience of both, construction of the building and preparation of the business, which required many meetings (32 committee and 29 general meetings during 19 months since the women's group was organized) and continuous exertion, made the group more united and strengthened the leadership of the committee. Establishment of the venue, the multi-purpose building, of their own, which could be mobilized as their own resource and where women could gather and discuss about their future plan, helps them to be united into more powerful cluster and contributed to their future development activities. Therefore, the construction of small-scale multi-purpose building is proposed in other areas where there is a potential to market the products of the area.

The experiences of the construction of multi-purpose building at Kampi ya Samaki are summarized below.

Box-1. Experience of the Verification Project at Kampi ya Samaki

Implementation Process

- Existing 18 women's groups gathered and united women's group of 401 members was organized for the construction of multi-purpose building and business operation.
- Series of trainings on leadership, business management and technical issues and study tour were provided.
- The building construction delayed for ten months from the initial plan because the contractor did not execute the contract.
- Honey was refined/bottled and handicrafts & honey shop opened in September 2001.

Evaluation

- Building construction was delayed for 10 months since the contractor did not execute the contract due to price escalation of materials and unclear management of money. It resulted in postponement of business commencement. Efficiency for the building construction is evaluated to be poor. As for business promotion and increment of income, data is not enough to evaluate the efficiency during the verification period.
- Committee members had cultivated strong leadership through great number of meetings and activities required for fund raising, plot acquirement, building preparation, business planning, procurement of materials for business operation, etc. Especially, great change was observed for the leadership of the chairlady. Members of women's group have become more self-assured and were able to initiate own activities.

Lessons Learned

- Small scale is preferable to start with, and scale of input could be enlarged step-by-step in accordance with the group capacity. In such way, benefit, though it's small, could be realized from the earlier stage and it would facilitate the group to continue their activities.
- Beneficiaries should be involved not only in the planning stage of the project, but also all the process of implementation stage.
- For the development of income generating activities in ASAL areas, diversification is necessary to stabilize certain level of income, considering unreliable resources over years.

It is recommended to establish such buildings in Marigat and Kapkuikui areas, so that they can act as a business and information center to collect/refine honey, provide handicraft materials and marketing information, and produced handicraft and processed honey could be sold there. If the necessity of the building construction is felt, the target group who are eager to participate should be identified. It should be explained that all the responsibilities will be borne by them and their objective is not to acquire the building itself, but to promote income generating activities by utilizing the building.

All the necessary cost in a long term, including building construction, business preparation and building maintenance and management fee should be discussed and confirmed in advance and appropriate size and structure will be decided with the identified group. As for the verification site, it took longer period to complete the building construction, and one of the reasons was the planned size. In addition to the cost sharing of about 340Ksh per member for construction fee, members of the women's group had to prepare for additional 500Ksh for business preparation and others, and it was a burden for most of the

women. As a result, operation of shop was delayed in ten months. Therefore, size of the building should not be too big, so that benefit could be realized from the earlier stage and it would provide a chance for needy people to participate the activity. In addition to that, the simple structure is preferable to promote several industries at the same time and to utilize the rooms for any other purpose.

Since the contract for the building construction was made between the contractor and the Study Team and the women's group was only involved for selection from several applicants, opportunity was limited for the women's group to directly participate during the construction stage. However, after the contractor stopped construction work, committee members of the women's group estimated necessary materials to finish the work, purchased them, and arranged for a supervisor and laborers to complete the construction. At least one of the members was supervising the site to procure additional materials and monitor the work. Though the experience and capability of the target group should be considered, the target group could initiate and manage all the process of the construction, including material procurement and arrangement of necessary workers with the support from government staff.

2.6) Program 6: Tourism

Though Baringo Lake is receiving many tourists of more than thirty thousand people per year, major beneficiaries from the tourism are limited to tour boat guides, restaurants, hotels and other small shops. Even around Lake Bogoria: another tourist place, there is no remarkable benefits from the community except for the shopkeepers of honey on the roadside. It is recommended to diversify the tourist industry to attract more visitors and also to expand its beneficiaries. As seen in the figure below, there is no relationship between the amount of rainfall and number of tourists. In this regard, tourism could mitigate the impact of drought and support to stabilize people's livelihood.

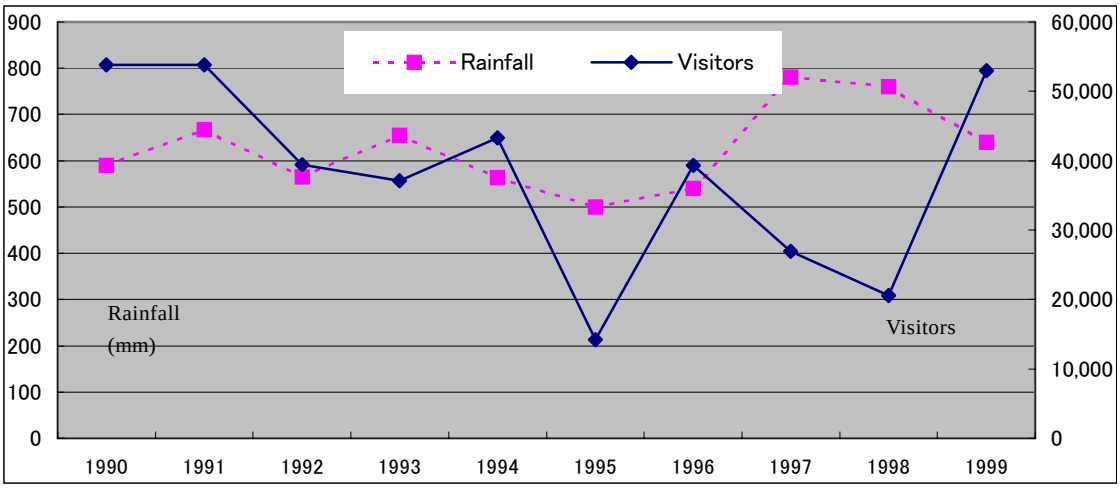


Figure 6.5.10 Relationship between Rainfall and Visitors of Lake Bogoria

According to the PRA survey conducted in Marty Village in Salabani area in September 1999, villagers raised a village cultural center and village ostrich farm when tourists were asked about what they would like to see in the future.

Tourists are interested to see the life of different ethnic groups and visiting their homestead. Fortunately, many ethnic groups are living around Lake Baringo, and visitors can touch with life the people of Il Chums, Pokot, Luo, Tugen, and Turkana at the same place. Cultural center could be established using local material next to the Kampi ya Samaki multi-purpose building to show and introduce their life style and to attract more tourists.

The number of ostrich in the area is decreasing, but it can be raised inside the fence to protect and to attract tourists. After having enough number of them in the future, commercial production of meat and skin could also be considered. However, ostrich is considered as a sacred creature for Il Chums people, so it should remained that way until they accept that raising them can be an income generating activity. On the other hand, not many people living near Lake Bogoria are benefited in terms of tourism, besides the individual honey shop owners seen on the road side near the Lake. After promoting small-scale industries in the area near Lake Bogoria, targeting tourists, people in the area might realize the importance of wild life, especially flamingos, to attract tourists, so that their business goes on. Since wild life will be the important resource for tourism, community based wild life conservation could be considered.

At present, every visitor has to pay 200Ksh to pass the gate, which was constructed by County Council in 1996. Some residents mentioned that the number of visitors decreased because of the collection of entrance fee. During the PCM workshop held in 1999, participants noted that a reduction of entrance rate would lead to the incremental increase of visitors. It is required to have the discussion between people in the area, County Council and coordinating agency, but certain percentage of the entrance fee might be used for the above activities to improve tourism in the area.

Table 6.5.6 Implementation Schedule of Small-Scale Industry Development Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
1. Honey Promotion	**Short Term（1-5 years）** - Provide training on beekeeping for youth and women's groups based in the area of high potential of honey production	Cluster A, D, E, and G	18 groups are trained in beekeeping	MOARD, Donors
	- Support beekeeping groups to market their harvested honey to Muungano Women's Group. Establish network and circulate information on demand, price, etc.	Kampi ya Samaki and above areas	Muungano group purchase crude honey from whole area	MOARD, Muungano group
	- Expand the market of bottled honey to tourist hotels and supermarket in Kabarnet and other town	Muungano group	300 bottles of honey/month	-do-
	- Bee-wax candle are produced	-do-	50 candles/ month	-do-
	Mid Term (6-10 years) - Member of the Muungano group provide training on refining honey and bottling for the group in Kapkuikui and Marigat where small-scale multi-purpose building is constructed	Kapkuikui and Marigat	3days/place	Muungano group, honey refining groups, MOARD
	- Bottles and labels are prepared together with the Muungano group	-do-	30,000 bottles	
	- Trained group start refining and bottling of honey	-do-	100 bottles/ month/place	MOARD, concerned group
	- Honey is marketed to Nakuru and Nairobi	Kampi ya Samaki, Kapkuikui, Marigat	500bottles /month	MOARD, Muungano group, Honey refining groups
	- Honey refining group start producing bee-wax candles with the assistance of the Muungano group	Kapkuikui and Marigat	50 candles /month/place	-do-
	Long Term (11-20 years) - Search for the international market	Kampi ya Samaki, Kapkuikui, Marigat	1,000 bottles /month	MOARD, NGO, & Villagers
2. Handicraft Promotion	**Short Term (1-5 years)** - Organize a study tour to Nairobi for interested women's groups to shift their mind to market-oriented thinking.	Whole Study Area except Salabani	6 tours	Donors, MOARD

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	- Evaluate existing local resources with target women and examine which resources could be utilized.	-do-	6 evaluation workshop	MOARD, PDDC*
	- Provide technical training. Courses and trainers are selected by concerned women.	Interested group	6 training courses	Donors, MOARD, NGOs/PDDC
	- Establish network to circulate market information and to procure materials together at a time.	Whole Study Area	6 information circulation groups are appointed	MOARD
	- Produced handicrafts are sold at the shop in Kampi ya Samaki	-do-	Handicrafts are brought from whole Study Area	Muungano group, MOARD
	Mid Term (6-10 years) - Handicrafts are sold at newly established small scale multipurpose building	Kapkuikui and Marigat	-do-	MOARD
3. Utilization of Fish Resource	**Short Term (1-5 years)** - Introduce large scale production of improved cooking stove for frying fish to reduce firewood consumption	Kampi ya Samaki	10 improved big stoves are constructed	MOARD
4. Market Improvement of Skin and Hides	**Short Term (1-5 years)** - Skin and hides marketing group is organized among butchers	Marigat, Kimarel, Sandai, Loboi, Kapkuikui	7 groups are organized	MOARD
	- Collected skin and hides are marketed together to the tannery in Nakuru	-do-	6 trips/ year/group	-do-
	Mid Term (6-10 years) - Skin and hides marketing group is organized among community people	Whole Study Area	11 groups are organized	-do-
	- Collected skin and hides are marketed together to the tannery in Nakuru	-do-	6 trips/ year/group	-do-
	- Detailed feasibility study to establish tannery is conducted considering the support impact on environment and water availability	-do-	Site and scale are decided.	MOENR, MOARD
	- Wattle trees to be used for tanning hides are planted	Near the planned tannery site	Wattle tree plots are established	-do-
	Long Term (11-20 years) - Establish small scale tannery	Near river	Small-scale tannery is established	MOTTI

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
5. Establishment of Multi-purpose Building	**Mid Term (6-10 years)** - Organize a group to utilize small-scale multipurpose building	Kapkuikui and Marigat	2 groups are organized	Social Service
	- Provide leadership and business management training for the target group	-do-	12days/group	Social Service, local consultant, NGOs, donors
	- Acquire a plot, procure materials and construct the building	-do-	2 of small-scale buildings are constructed	Donors, County Council, MOARD
	Long Term (11-20 years) - Follow-up intermittently and provide business skill training if necessary	-do-	8 days/year/ group	Social Service, MOARD
6. Promotion of Tourism	**Short <u>Term</u> (1-5 years)** - Establish cultural center with local materials next to the handicraft shops at Kampi ya Samaki	Kampi ya Samaki	3 hut houses are constructed and decorated	MOTTI, donors
	Mid Term (6-10 years) - Community based wild life conservation (awareness campaign, wild life conservation trainings, protection of wild life)	Around Lake Baringo and Lake Bogoria	Number of wildlife remains the same	MOENR, donors
	Long Term (11-20 years) - Establishment of ostrich farm	Kampi ya Samaki	Plot is fenced and keep ostrich inside	MOTTI, MOENR, donors

Note: * PDDC; Product Design Development Center, an organization based at Nairobi and provide handicraft technical training and marketing information.

6.5.5 Human Resource Development

1） Understanding

1.1） Background

The human resource development plan addresses the improvement of education and enhancement of awareness at the institutional (schools and post-schools) and community levels respectively. These two levels are closely linked to the extent that on one hand, an improvement in schooling, which would instil self-confidence and self-reliance in students depends on public support and general public awareness. On the other hand, in the long run, the improvement of awareness, knowledge and skill in the communities depends on the current quality of schooling.

Status of Youth Polytechnics in Kenya

Marigat Youth Polytechnic (MYP) falls under the category of youth polytechnics, which were previously commonly referred to as “village polytechnics”. These institutions target mainly dropouts of primary and secondary schools. Village polytechnics became popular during the 1970s when the modernisation paradigm was strong. In Kenya, most of these polytechnics were begun on a “Harambee” basis, with meagre communal resources. Only a few of these received GOK grants. According to the Artisan Training Programme1 of Kenya Institute of Education, the general aims of post-primary training programme (provided by youth polytechnics) are to;

1. Develop skills and attitudes to enable the trainee enter gainful employment,
2. Provide basic foundation to enable the trainee pursue advanced courses on either full time or part time basis.

For this reason, these institutions have not been popular with secondary graduates, who prefer to join colleges and technical institutes like the Kenya Industrial Training Institute (KITI) in Nakuru town. Institutes and colleges provide certificate, diplomas and higher diploma courses. Graduates from the institutes stand a higher chance of employment and/or self-employment than their youth polytechnic counterparts. Over time, youth polytechnics have become less responsive to the present needs and quite a number of them have been shut down for being dinosaurs. Nginyang Youth polytechnic, which is 30Kms North of Marigat town, is one example of a polytechnic that has been closed.

It is in this background that we have to understand the present situation, opportunities and threats facing Marigat Youth Polytechnic. Exerting even more pressure to the polytechnic is the local community whose resources are minimal, and their preference for traditional lifestyles undermines the interest towards education and training. Consequently, the

[1] Technical Education Programmes, Artisan Training Programme, KIE Carpentry and Joinery Course; Syllabi and Regulations, KIE, 1989.

polytechnic has been run in a relatively informal way.

The "Jua Kali" Sector

To the polytechnic, the "Jua Kali" artisans provide a good benchmark of the life after trade courses. A vibrant "Jua Kali" sector is good news to the polytechnic, which actually supplies the sector with more graduates. For this reason, therefore, the link between these two should be seen as symbiotic. Moreover the artisans in Marigat rely on the polytechnic for the access to expensive machines such as the lathe machine, which they would not be able to afford, keep or even run profitably. On its part, the polytechnic should be concerned about the fate of its graduates most of whom join the "Jua Kali" sector. The number of members registered to the "Jua Kali" association in Marigat is 120 and about an equal number are known to operate bur are not registered.

Already, carpenters from the "Jua Kali" sector in Marigat use the polytechnics equipment because they cannot afford to keep such equipment. There is a need to establish such links with the "Kokoto" group in Marigat. Though the group members have wide experience in breaking stones into ballast, they need some skills and advice on how to maintain good standards. The polytechnic, through the masonry course, has the capacity to assist them to improve.

1.2） Macro-level Issues

Consideration is also given to macro-level issues that impact on education and general awareness levels. In the recent past, there has been a growing level of unemployment in Kenya. With diminishing employment opportunities, graduates of secondary and primary schools find it difficult to secure employment, effectively bringing to question the significance of education. After graduation, one of their main hopes of the graduates lies in self-employment. This is where post-school institutions like the polytechnics can play a role. As a result of unemployment, retrenchments, cost sharing and a host of other macro factors, poverty has risen considerably. In the study Area, this has been reflected in the inability of people to pay fees and the reliance on subsidies and food relief.

1.3） Micro-level Human Resource Issues

a) Primary and Secondary Schools

Our findings indicate that late enrolment impacts negatively on the performance of primary schools. Yet late enrolment tends to be correlated to poor completion rates. The older the children are when they start schooling, the more likely they are to drop out. Girls drop out from school either to get married or because they have become pregnant, while boys may drop out to seek employment. Similarly, poor performance in both primary and secondary schools is attributed to poor and inadequate facilities and equipment, particularly boarding facilities, classrooms, laboratories, home science blocks, teachers

houses, workshops, office blocks as well as blackboards, chalk, books, desks and chairs. Though there is a general lack of such equipment and facilities in the schools in the Study Area, the situation is worse in schools in the Mukutani division. In a few other areas like Marigat town, the problem is that of fewer schools or classrooms, as was suggested in the PRA exercise in Ndambul. At another PRA site, Kapkole village, a similar need was identified as a priority, where they intend to improve facilities and provide water to their school.

b) Post-Secondary Institutions in the study Area: The Case of Marigat Youth Polytechnic

Marigat youth polytechnic is the only post-secondary institution in the Study Area. Over time, it has become unpopular with school leavers hence the decline in enrolment. From a high enrolment rate of thirty-three students in 1996, to fifteen this year, the institution finds it difficult to raise sufficient money to fund its activities. One of the reasons for its unpopularity is the fact that it offers long duration courses, which are no longer favoured by school leavers who wish to gain skills quickly and seek employment or begin income-generating activities. Yet young people in the Study Area continue to suffer from unemployment and the lack of skills to establish their own businesses. In the PRA site of Ntepes village for example, unemployment of the educated young is given third priority.

Over the years, the polytechnic has also provided training in very limited skill areas, namely masonry, carpentry and dress making and has produced too many graduates in these areas. New graduates cannot find jobs or enough customers to carry out good business. In addition, graduates who cannot find jobs cannot establish businesses due to lack of initial capital. External and internal problems facing the polytechnic include:

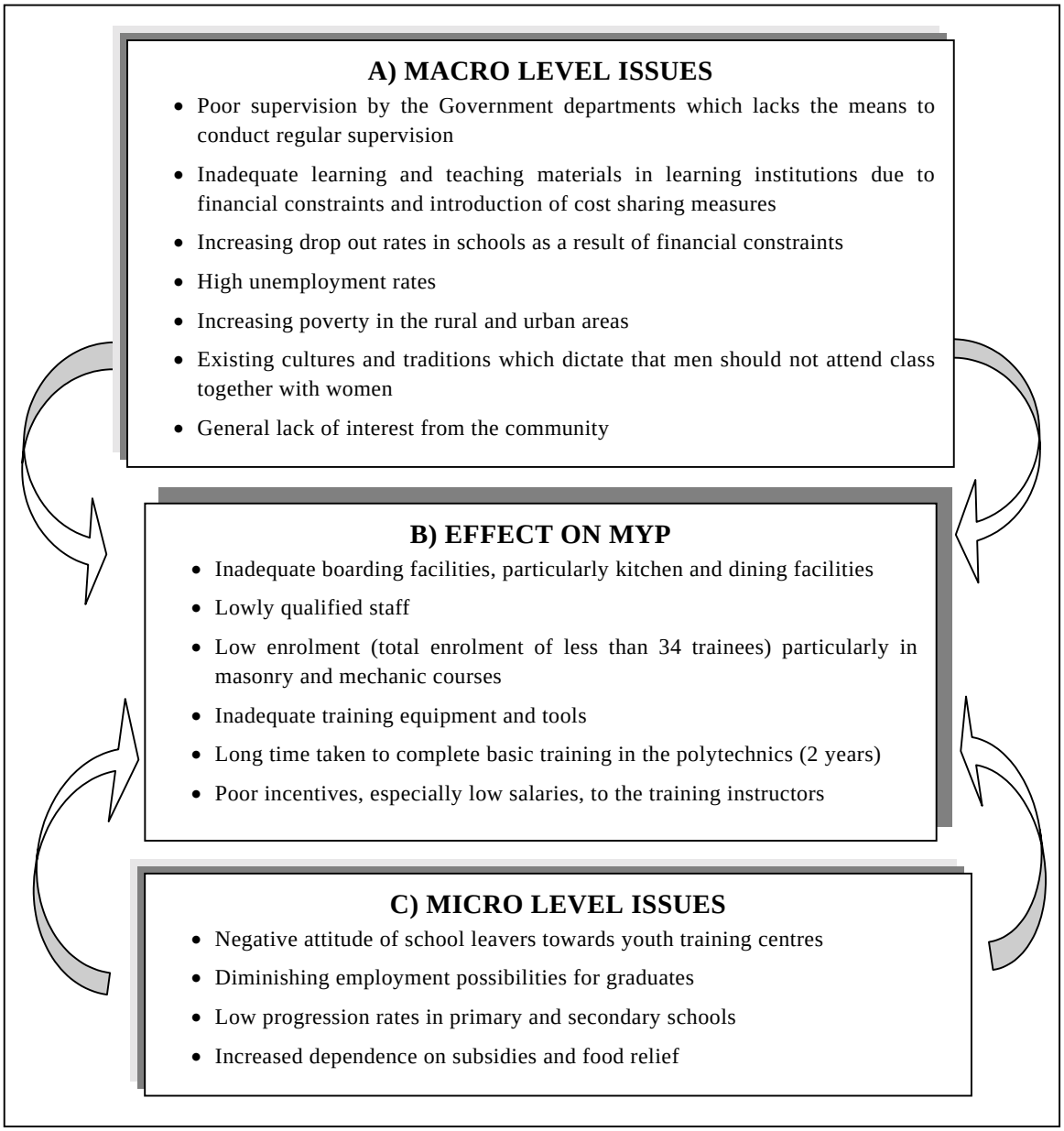
- Inadequate boarding facilities, particularly kitchen and dining facilities
- Lowly qualified staff
- Offering unpopular courses (such as metalwork and mechanics)
- Inadequate training equipment and tools
- Length of time taken to complete basic training in youth polytechnics
- Diminishing employment possibilities for graduates
- Poor incentives, especially low salaries, to the training instructors
- Negative attitude of school leavers towards youth training centres
- Diminishing employment opportunities for graduates

c) Human Resource Issues at Community Level

At the community level, it is vital to address illiteracy, low levels of awareness, knowledge and skills of both adults and out-of-school children. This category consists of people who

are already pursuing a livelihood either through employment or self-employment. Owing to the scarcity of employment opportunities, many of them certainly need to gain the appropriate skills to try out alternative ways. Adult education in the Study Area is addressed through literacy and Non-Formal Education classes. However the effectiveness of theses programmes in the Study Area is hampered by the following problems:

Macro and Micro Problems Influencing the Performance of MYP



Challenges that the polytechnic will continue to face in future include macro and micro dynamics as presented above. Current problems at the polytechnic are a result of what goes on at the local level and at the national level. However, the institution can only focus on internal problems shown in the box B.

2） Development Plan

Considering the lessons learned during the evaluation stage of this Study as well as the PRA and RRA surveys, PCM workshops conducted, and also consistent with the future district plans outlined by the Ministry of Education, Science and Technology (MOEST), the following plans are proposed:

During a PCM planning workshop that brought together various stakeholders of MYP, we decided that the project would focus on strengthening of carpentry workshop by equipping it with modern and more advanced tools and equipment. Additional support would be provided to the polytechnic by hiring a carpentry expert for a period of 6 months. His role would be to assist the polytechnic in training of trainees in the use of the new equipment, and in the production of more advanced products. Instructors would also undergo a short training sessions on Training of Trainers as a way of improving their skills.

Experience from implementing the verification project in MYP showed that by improving MYPs equipment and skills, the polytechnic increased links with “jua Kali” artisans, some of whom are former MYP graduates. Carpenters from Marigat now use MYPs equipment, consequently receiving better and more advanced services, while the Kokoto women Group benefited from training and hiring of some of the tools. Subsequently, both Jua Kali artisans and members of Kokoto Women group have benefitted by receiving higher incomes. In addition, short courses organised by MYP in a flexible manner, did attract some “jua kali” artisans and other community members.

In this verification project, we also planned to introduce short courses, both upgrading and introductory, in carpentry, motor-vehicle mechanics, garment making and masonry departments. Linkages with “jua kali’ artisans were to be promoted by providing quality services as well as hiring out tools to them. Trainees were to be supported through high level training on the modern equipment and through production of carpentry and garment production. Central to this plan was the procurement of the advanced equipment for the carpentry workshop as well as the re-organisation of the workshop. Lastly, MYP was to in crease the awareness of its services and courses to the entire community through intensive awareness creation activities.

Regarding the implementation of short courses, some changes were made. First, MYP tried to implement the courses on the regular trainees, but this was not cost effective, as they did not pay an extra fee. Ultimately, this plan was put on hold.

2.1） Support to Marigat Youth Polytechnic (MYP)

Results from our the evaluation of the MYP verification project supports the view that the polytechnic still has a lot of potential to re-establish itself if only it can embrace change. Since the project begun, enrolment and the income of MYP have increased. The

polytechnic also has the potential to generate extra income through other means that may focus around the special equipment it has or the skills it imparts to students. Therefore the following plans can improve the polytechnic as well as increasing a wider variety of more appropriate tools to the community.

Activities

1. Training of the management committee and the trainers involved in the management of change and management skills.
2. Restructure the management committee to include more business-oriented and committed members, with an upright character.
3. Assist the management committee in restructuring the institution, particularly with a view to upgrading it into a Technical Institute.
4. Support the polytechnic in establishing, improving and sustaining viable income-generating activities.
5. Equip the polytechnic with adequate materials and equipment for existing and new courses identified.
6. Assist the polytechnic in introducing more popular and relevant courses such as metal work, mechanics, computer, art and craft.
7. Support the design of more flexible short term courses, and admit students of a wider variety of skill development needs, including adults
8. Extend financial support in form of credit to needy graduates who develop viable ideas to establish their own income generating activities.

In the long run, the polytechnic should be transformed into a Technical Training Institute. This will be realised if the above activities are well accomplished and expansion has been manifested.

Way Forward

a) Formulation of a constitution

In order to streamline the work of the management and the executive committee and to clarify their roles in relation to each other, a constitution will need to be formulated. This will need to go beyond adopting the constitution for government run polytechnics because MYP is not government run. However, as a way of beginning, they can adapt and modify that constitution to suit the needs of MYP. Finally, this constitution should be made public and shared among all the members of the boards and staff.

b) Developing Clear Procedures and Systems

In order to guard against misuse of authority and possibilities of conflict among committee members and even the staff, there will be a need to formulate clear policies, procedures and systems of procurement of goods and services, hiring and firing staff, handling finances

and other essential areas.

c) Aggressive and Timely Awareness Creation

Work on increasing awareness of the polytechnic is a continuous process. In future, the polytechnic will need to target students in their final year of primary and secondary education. This will require the posting of information on time, which is during their last term before they leave the school.

2.2） Support to Pre-primary schools

This plan addresses the problem of low and late enrolment in primary schools. Early childhood education has been accorded a high priority by the MOEST. Low and late enrolment in to primary schools is principally a problem of few pre-schools in many areas, as well as a lack of awareness regarding the importance of early childhood education by parents. Pre-primary schools can go a long way to address this problem, especially where primary schools are located so far away that parents opt to send their children to school when they are old enough to walk the distance.

Activities

1. Sensitise the community about the importance of formal education and early childhood education through awareness campaigns in the communities
2. Identify appropriate sites for additional pre-schools, as well as the primary schools the pre-shools will serve, in areas with low enrolment and few pre-schools. Also identify existing pre-schools that require assistance in such needy areas.
3. Construct additional pre-school buildings and refurbish the buildings of existing ones where such need has been identified.
4. Equip new pre-schools as well as existing ones in need.
5. Identify and hire teachers for the new pre-schools.
6. Provide further short-term training for the teachers.
7. Run pre-school on a cost recovery basis

2.3） Non-Formal Education (NFE)

Mainly for out-of-school children who are less than fifteen years old, this plan will address the problem of education, lack of knowledge and skills for dropouts and children who are too old to fit in to a formal school. Besides education, they should develop skills, which will improve their chances of becoming self-reliant. The learning of relevant knowledge and skills relating to their livelihoods (e.g. animal husbandry, agriculture, income generating activities etc.) should be given sufficient coverage in the NFE. The main feature of NFE is the development of a non-formal curriculum, which is flexible in terms of classroom behaviour and attendance, and also incorporates a subject content relevant to

the environment and modes of the learners' economy. Ultimately, NFE should combine formal, non-formal and traditional education in the best way possible.

2.4) Functional Adult Literacy

In this plan, adults will be provided with an opportunity to gain not only literacy and numeracy skills, but also to collectively gain knowledge about issues that bear relevance to their lives, learn new skills in those areas, and determine activities that will improve their lives. This plan will be incorporated into the activities of the Adult Education Department. Functional adult literacy (FAL) lays emphasis on learning based on local experiences, through the design of a curriculum that is specific to the environment of the learners. In FAL, learners gain more awareness about their environment, deeper and relevant knowledge about the aspects that they choose to learn about. Consequently, they take collective action on the priorities they selected. Priorities in the case of our Study Area are expected to include issues concerning livestock, agriculture, environment, income generating activities, health and sanitation as well as broad areas of interest such as operation and maintenance, management, and book keeping.

2.5) Improvement of Primary School Facilities and Equipment

As a way of boosting the education of children in the district, and overall performance in primary schools, this plan aims to equip existing schools. Moreover, it aims to uplift the level of education by improving the standard of school buildings and other infrastructures as necessary. An improvement of the learning environment of the children can go a long way to enhancing performance in school. This plan will focus on providing learning materials such as text and exercise books, chalk and blackboards, learning equipment such as, desks, chairs and laboratory tools and equipment, and finally the construction or improvement of classrooms, offices, teachers quarters and boarding blocks. Where disparities between the sexes are manifest, particular attention will need to be focused on improving the participation and performance of girls' in education, by considering the construction of girls' boarding facilities for instance.

Table 6.5.7 Implementation Schedule of Human Resource Development Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
1. Support to Marigat Youth Polytechnic	**Short term (1-5 years)** - Training of the management committee and the trainers involved in the management of change and management skills. - Restructure the management committee to include more business-oriented and committed members, with an upright character. - Assist the management committee in restructuring the institution, particularly with a view to upgrading it into a Technical Institute. - Support the polytechnic in establishing, improving and sustaining viable income-generating activities. - Equip the polytechnic with adequate materials and equipment for existing and new courses identified.	Marigat and Mukutani divisions	60 primary and secondary school leavers and dropouts of Mukutani and Marigat divisions per year	MOEST Management Committee Community
	Medium Term (6-10 years) - Extend financial support in form of credit to needy graduates who develop viable ideas to establish their own income generating activities. - Support the design of more flexible short term courses, and admit students of a wider variety of skill development needs, including adults - Assist the polytechnic in introducing more popular and relevant courses such as metal work, mechanics, computer, art and craft.	Marigat and Mukutani divisions		MOEST Management Committee Community
6.Transformation (upgrading) of Marigat Youth Polytechnic into a Technical Training Institute.	**Long Term (10-20 years)** - Support the upgrading of Marigat Youth Polytechnic with equipment and materials for all its courses - Expand the learning and boarding facilities of the polytechnic	Baringo district	Primary and Secondary school leavers	MOEST, MOCSS Management Committee Community

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
2. Support to Pre-primary schools	**Short Term (1-5 years)** - Sensitise the community about the importance of formal education and early childhood education through awareness campaigns in the communities - Identify appropriate sites for additional pre-schools, as well as the primary schools the pre-schools will serve, in areas with low enrolment and inadequate pre-schools. Also identify existing pre-schools that require assistance in such needy locations. - Construct additional pre-school buildings and refurbish the buildings of existing ones where such need has been identified. - Equip new pre-schools as well as existing ones in need. - Identify and hire teachers for the new pre-schools. - Provide further short-term training for the teachers. - Run pre-school on a cost recovery basis	Marigat and Mukutani divisions	Under six year old children of Marigat and Mukutani locations	MOEST Relevant Communities
	Mid Term (6-10 years) - Construct additional pre-school buildings and refurbish the buildings of existing ones where such need has been identified. - Equip new pre-schools as well as existing ones in need. - Run pre-schools on a cost-recovery basis	Baringo District	Same as above	
	Long Term (10-20 years) - Expand and extend the programme above to the whole district	Baringo District	Same as above	
3. Non Formal Education	**Short Term (1-5 years)** - Identify active and needy Non Formal Education centres in the two divisions. - Support the training of teachers in Non Formal Education - Provide support in materials and equipment - Support the improvement of potential NFE centre	Marigat, Mukutani	Overage children and primary school dropouts	MOCSS, MOEST
	Mid Term (6-10 years) - Expand the programme above to the whole district	Baringo District	Same as above	
	Long Term (10-20 years) - Expand the programme above to the whole district	Baringo District	Same as above	

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
4. Functional Adult Literacy	**Short Term (1-5 years)** - Identify active and needy adult literacy centres - Develop a Functional Adult Literacy curriculum based on local experiences - Train local literacy teachers in Functional Adult Literacy - Support the centres with learning materials and equipment. - Support the centres in the formulation of local curriculum	Marigat, Mukutani	Illiterate adult population	MOCSS
	Mid Term (6-10 years) - Expand the programme above to the whole district	Baringo District	Same as above	
	Long Term (10-20 years) - Expand the programme above to the whole district	Baringo District	Same as above	
5. Impov't of Primary School facilities and equipment	**Short Term (1-5 years)** - Identify needy primary schools with a potential for growth - Support the schools with basic learning materials and equipment	Marigat, Mukutani	Public primary schools	MOEST
	Mid Term (6-10 years) - Improve the learning facilities of the priority schools, with emphasis on schools enrolling girls.	Baringo District	Same as above	
	Long Term(10-20 years) - Expand the programme above to the whole district	Baringo District	Same as above	

6.5.6 Infrastructure Development

1） Understanding

Advanced culture, created by urbanization trends and irrigated agriculture, has come from the southern direction and it has sent traditional culture, characterized by a primitive pastoral lifestyle, away to the north of the Study Area. Baringo Lake used be a buffer zone between both cultures because of the existence of water. The Baringo Lake is located in the northern boundary of the irrigated agricultural area around the Study Area, and the water in Baringo Lake attracts people affected by drought pressure from the north. The buffer function of Baringo Lake also acts to ease the pressure. Consequently, the trend of decreasing water from Baringo Lake will affect its buffer function and will also affect development condition of the Study Area.

The development in the Study Area has increased in two ways, one is due to the road and the other is due to the river. Motorization, electrification, communication and tourism have come through the national trunk road, which is located in the western part of the Study Area. Irrigated agriculture needs the abstraction of water from rivers and is extended along the permanent rivers. Marigat is the center point of these two factories, and it attracts many people who want to get business opportunities. A concentration of population in Marigat is going to affect the rural infrastructure so as to make it inadequate.

At present, over-abstraction of water is leading to a decreasing of water from Baringo Lake, and inadequate budget allocation causes the non-operation of rural infrastructure. The buffer function of Baringo Lake will be lost with water disappearance, and drought pressure will pass away easily from the north to south. Consequently, the concept of agricultural/rural development in the Study Area should be to keep water in Baringo Lake for a longer period, not to enhance the positive use of water.

1.1） Agricultural Infrastructure

A large number of livestock and big family size are important life status symbols in the Study Area. Irrigated agriculture has now become a new life status symbol. Study results of the RRA, PRA and PCM workshops show a strong demand for irrigation, because the information from southern highland areas makes them believe in the dream that an irrigated agriculture can give good business opportunities and can support the livelihood of a family.

In fact, some people on the Perkerra irrigation scheme get cash incomes and this seems enough evidence for others to believe in dreams for their life in the future. However, this opportunity to get much cash incomes through irrigated agriculture can cover only the southern part of the Study Area. It cannot extend all over the Study Area because there are no perennial rivers in eastern, western and northern parts. In the southern part of the Study Area, such dreams of irrigation accelerate the illegal abstraction of water and the

quantity of this abstraction is increasing year by year.

Water acts in Kenya provide a water authority that decides water abstraction quantity for each user legally in each catchment area, taking into account the water balance of the catchment area based on water assessment. However, illegal water abstraction makes it difficult to collect exact data and information for water assessment and a lack of budget allocation spurs this tendency to go on because government staff cannot carry out enough studies and surveys for assessment, and information work on water right for the community. Now, people will believe that anybody who wants to abstract water for irrigation can get water, with impunity. Under such conditions, a strong demand for irrigation facilities that would extend the irrigated area has come out of the PRA, RRA and PCM workshops (refer to APPENDIX; M.1, Table M.1-2, Table M.1-3, Figure M.1-1, Figure M.1-2).

In this report, water balance simulation between Baringo Lake and water abstraction for irrigation/others is carried out in order to estimate limitation of water abstraction from Barigo Lake. The detail of results are shown in APPENDIX; H.3. The result of simulation shows that water level in Baringo Lake goes down suddenly with water abstraction for irrigation and after that it gradually goes down according to water use for livestock and domestic use. So water level in Baringo Lake mainly depends on water abstraction for irrigation. This shows that the environment of the Study Area is seriously affected by the situation of Baringo Lake. From the engineering point of view, therefore, installation of a permanent irrigation facility can only be adopted in the southern part of the Study Area (the southern part of Baringo Lake), but it cannot develop any further because of the water balance between water abstraction quantity and water level in Baringo Lake. The present water balance, relationship of Baringo Lake between water abstraction and water level, shows the importance of effective water use for irrigation and it shall be a core item of the Master Plan for developing agricultural infrastructure.

1.2） Rural/Social Infrastructure

a） Water Supply

Some of the heaviest work of people in the Study Area is considered to be water fetching for domestic use. Woman and children usually have to carry out this work every day in almost all places except for public water supply service areas, and the work takes time (from two to four hours for one trip; in severe places-maximum of six hours). Water resources are found in rivers, lakes and pans. This is the typical condition of the ASAL area and workshops in PRA and PCM, and RRA, in the Study Area showed a demand for a water supply system with enough quality and quantity for domestic and livestock uses.

As a matter of course, water for domestic and livestock use is an essential item for the people, and so a substantial facility shall be prepared. In the Study Area, main water resources include rivers, pans, the lake, ground-water and springs. Water supply systems

from these water resources cannot meet their demand, because the quantity and quality does not satisfy the demand. For example, the water of a pan reservoir and seasonal river can be used only in the rainy season (April/May/June to August/September) and the following few months, and after that, people must go and fetch water from a perennial river or a lake in the dry season (November to March). Users of pan reservoirs and seasonal rivers are distributed all over the Study Area. From this reason, providing adequate water quantity in water supply shall be given top priority.

The ground and lake water quality in the area, whish is from Bogoria Lake to Baringo Lake through Loboi Plain, is not suitable for drinking because of its fluoride concentration, but many people depend on this water. In fact, many water supply projects using the borehole system have been carried out in this area, but almost all of them have been abandoned because of the poor water quality. However, there is no choice for people to get water, and the quantity of water is also inadequate. Consequently, water supply with enough quantity shall be considered at first. After fulfilling this demand, an improvement in the water quality shall be carried out.

Available ground water ranges from the south to southeast side of Loboi Plain, and the water production is higher than that of Loboi Plain center. Surface water from Perkerra River and Arabal River can produce an adequate quantity of water for domestic and livestock use and its fluoride concentration is low. For the improvement of water quality in the Study Area, which has been mentioned above, the use of water from these resources is recommended. The quantity of the water use is not as large as the water use for irrigation, so the effect on the environment can be considered as not so severe.

For pan reservoirs, rehabilitation and maintenance work is important for sustainable use. There are 30 pans in the study area with 5,050,000 cu.m of the total initial capacity. Due to long terms of lack of maintenance, however, the capacity has reduced to 1,506,000 cu.m which is used by 27,000 inhabitants. The summary data concerning the pan in each division is as follows (refer to APPENDIX Table N.1-1).

The summary data of Pan

Division	Number of pan (number)	User population (number)	Initial capacity ('000cu.m)	Present capacity ('000cu.m)
Marigat	16	21,160	5,003	1,489
Mukutani	14	5,770	46	18
Total	30	26,930	5,049	1,507

During the workshops in the Study Area, there were some requests for pan rehabilitation. Usually, these pans will silt up within 5-7 years after construction or rehabilitation. After siltation, the community of pan-users contributes 25 percent towards the rehabilitation costs of bulldozer or backhoe work. Donors will pay the remaining 75 percent of the

rehabilitation costs. In advanced areas, outside the Study Area, this kind of work is carried out by the community itself as ordinary work. People in that area must desilt the pan every time they fetch water, using a hand bucket. The introduction of this kind of work shall be considered for the Study Area.

b) Road Transportation

The work on the roads has been done by the Ministry of Roads and Public Works (MORPW) in recent times and in the past some work was done by the community. The cost of construction and upkeep of the road, not paths in the village, is high, so contributions from the community become difficult. The road network is now adequate in the Study Area, but the community indicated at the workshops that they wanted to improve and maintain the present road condition. The road network in the Study Area are composed of classified roads from class B (National trunk roads) to class E (Special purpose road and Minor roads) and a few unclassified roads as follows;

Road Network in the Study Area

Division	Classified Road (km)	Unclassified Road (km)	Total (km)
Marigat Division	216.5	50.0	266.5
Mukutani Division	-	32.8	32.8
Total	216.5	82.8	299.3

Almost all roads are constructed on the Loboi Plain, the southern and western area of Baringo Lake, and they are affected by river flow conditions or surface water flow conditions during the rainy season. For example, the national trunk road, the B4, crosses the Loberer River, but at the crossing point there is no bridge. At this point, the MORPW must remove river siltation on the road during the dry season every year. Another example is that the flow course of the Endao River had changed from the north to south at about 500m upstream of the crossing point of route B4 in 1997. There is no bridge at the new crossing point, so the road foundation has been damaged. Nearly the same thing has happened around junctions of the C51, D365 and E460 – where the embankment material was washed away by gully erosion (surface water flow) (refer to APPENDIX; Figure N.1-4, Table N.1-2).

The demand for the improvement of road conditions is rising in Mukutani location, and it has been already planned by the MORPW. The district officer gives priority to and has planned such work, but due to lack of allocation of government budget the work was put off. In addition, the cost of maintenance becomes high due to natural conditions which have been mentioned above, so selection is required between usual maintenance/ rehabilitation and improvement of road condition.

Private companies provide transportation needs. The name of private transportation vehicles is “Matatu”. Mini-bus, estate (van) and pick-up cars are used for Matatu. The transportation along route B4 (Nakuru-Marigat), and part of the C51 (Marigat-Kabarnet) has many scheduled trips per day, and also has many extra trips. This service covers Marigat and Kimarel locations. On the trip from/to Marigat, along part of the E461 (B4-Loboi), there is one usual trip per day, and a fair number of extra trips, and the location/name of this service is Kapkuikui, Loboi, Sandai. Other routes have little transportation, at two to three trips per week and extra trips are also rare.

The cost of the Matatu depends on the distance traveled and on the condition of the road, 10-30 Ksh each way around Marigat, 40-70 Ksh to mid- remote areas, and over 100 Ksh to remote areas from Marigat to Mukutani or Arabal. The cost of the trip to each location from/to Kabarnet, Nakuru and Nairobi is based on the costs of Marigat. The total cost is calculated as each location from/to Marigat plus 100-120, 150-180 and 300-400 Ksh respectively. If there is a high demand for transportation, the cost of the Matatu will become more reasonable and its number of journeys will increase (refer to APPENDIX; Table N.1-3, Table N.1-4).

c） Electricity

The electricity service does not cover the whole Study Area, and demand for electricity at present is limited only around Marigat and Ngambo towns. The total electricity supplied by the Marigat transformer is 1.7 Mega VA and is now over the Marigat Transformer capacity of 1.5 Mega VA. The customers in the Study Area do not use much electricity, and actual consumption under the Marigat Transformer is about 0.5 Mega VA, so 1.0 Mega VA is available for additional or new customers in Marigat town (refer to APPENDIX; Figure N.1-5).

d） Telephone Circuit

Demand for a telephone service is limited only to Marigat town, which is shown in workshop results. In the Study Area, there are two telephone exchange numbers; one is the Marigat exchange and the other is Kampi ya Samaki exchange. The total capacity of the telephone lines is 300 lines, and 66 lines are now used. These 66 lines include eight coin boxes, 46 business numbers and 12 numbers for resident use. There is an extension capacity which depends on customer demand. New customers have to pay 8,200 Ksh/line. In addition to the above telephone circuit, a line has been extended from Kabarnet exchange to Mukutani center through SR (radio) system.

2） Development Plan

2.1） Agricultural Infrastructure Development

The programs of agricultural infrastructures are planned as follows;

- *Catchment Water Resource Assessment*
- *Strengthening of Water Authority*
- *Water Management*

a） Catchment Water Resource Assessment

Water abstraction for irrigation directly affects the water level of Baringo Lake, so additional new irrigation schemes are not recommended in the Study Area. Instead of new irrigation schemes, the effective water management of irrigation shall be considered for the present irrigation schemes. To achieve effective water management, irrigation and drainage network maps, canal systems improvement and farmland leveling are fundamental requirements. The purpose of this management is to save irrigation water, and water-saving cultivation is necessary for the ASAL area because of limited rainfall and high evaporation rate. To utilize limited resources effectively, therefore, improvement of old and/or non-functioning infrastructures and maintenance for these facilities are good ways. They, such as reducing conveyance losses by lining for canal and appropriate water management, will realize to supply irrigation water to the area far in the downstream reaches.

On the other hand, water resource assessment shall be done, not only in the whole Baringo Lake catchment area, but also including the whole Bogoria Lake catchment area. In fact, up to the present time, many water resource assessments have been carried out in each district, but they have been divided up by the boundaries of social administration. For water resources, there is a boundary of “natural administration = catchment area”, and this shall not be divided up in the assessment work. It is recommended that the water resource assessment be carried out in the early stages of water management.

The water resource assessment project will include installing hydrologic equipment for measuring the discharge of the river and water level of lake (Baringo and Bogoria), preparing and repairing the rainfall gauges and evaporation pans, and to collecting their data. After collecting this data information on rainfall and the discharge of the river will be determined as well as information on the discharge of the river related to water abstraction for irrigation, and the relationship between these two pieces of information will be compared. Using this relationship, the water balance in the catchment area can be estimated. The GOK is now trying to carry out these assessments and after that backup from outside will be required.

b） Strengthening of Water Authority

Simultaneously, the water authority for the Baringo Lake catchment area shall be organized or reorganized. Water acts in Kenya has already provided a water authority, but the inadequate budget allocation makes it function inadequately. Taking this situation into consideration, cooperation with the community is necessary and an information and technical transfer between the government and community will be done. That is because the main problem for water authority now is the illegal water abstraction for irrigation.

c） Water Management

There are two types of illegal water abstraction for irrigation: one is for commercial use and the other is for survival. The former is found on a large-scale and is now expanding especially in the major irrigation schemes (in Marigat, Loboi, Sandai and Eldume locations). The latter is found on a small-scale irrigation from seasonal rivers (in other locations). Water charges for irrigation shall be collected from large-scale irrigation schemes, and the collected charges shall be used for the water resource conservation of the catchment area.

After finishing the water assessment of the catchment area, agricultural infrastructure facilities and irrigation development can be considered for the Study Area. The target water sources will be Perkerra River and Molo River. Food demand in the ASAL area always requires new irrigation and agricultural development projects, but providing a new irrigation scheme shall be a long term objective with consideration of water resource assessment.

2.2） Rural/Social Infrastructure Development

The programs of agricultural infrastructures are planned as follows;

- *Water Supply Facility Arrangement*
- *Road condition Improvement*
- *Electricity Service Expansion*
- *Telephone Service Expansion*

a） Water Supply Facility Arrangement

Water supply for domestic use is an important component and it is a necessity for life. The required water quantity for domestic use is not much compared to the quantity needed for irrigation. The quality of the water supply shall follow the standard value of the GOK. According to the standard of GOK, the concentration of fluorine compound has to be under 3 ppm, but it is very difficult to keep this standard in the Study Area because of the high fluoride concentration of the water. In spite of the poor quality, about 12,000 people

depend on the water of Baringo Lake. To solve this problem, creating a pipeline water supply from the upstream side of the Baringo Lake catchment area shall be considered. This water supply system will need a big amount of budget and its operation and maintenance will become difficult because of the long distance.

The community needs a water supply as early as possible, so the water abstraction point and supplement point shall be near the people and at the same time will save money. It should also consider the supply of water for livestock when determining the supplement (outlet) point. The concentration of fluorine compound in Baringo Lake is from 7.7 to 24 ppm and varies from place to place (MOWR, 1987). To remove the fluorine compound is quite difficult and the cost becomes high, so such a scheme not be realized. Fluoride concentration around Kampi ya Samaki has been registered at 7.7 ppm, and this water can be used for drinking after being mixed with a low fluoride concentration water.

The concept of a water supply project in the Study Area needs two stages, the first stage would involve constructing a water supply facility, but the water quality would be the same as the water that they are using now. During this stage, the main purpose of the project would be to supply water to the community as soon as possible, so adequate water quantity would be prioritized and the quality of the water would remain unimproved from present condition.

The second stage is to improve the water quality to the standard of the GOK, so the water, which can be supplied in the first stage, shall be mixed with low fluoride concentration water, for example with water from the Molo river, Perkerra river or from boreholes. This stage will need to be more carefully maintained and operated than the first stage, because the water source location on first stage for the mixing process will be far from the initial installed water supply facility. Consequently, before starting the second stage, preparation works for installation of new water supply facility will be necessary.

The main preparation work would be to strengthen community organization and carry out a technical transfer of maintenance and operation work to community. Usually, Department of water Development and the National Water Conservation and Pipeline Corporation does this kind of operation and maintenance work, but participation from the community is necessary to sustain the project. A problem with the water supply in the Study Area is collecting and measuring water bills, because the usual water supply system in rural areas does not have a water meter that would have determined the quantity consumed by each family or community.

With pipeline systems in rural areas, many users fetch water from the same tap, and payment is decided as 160 Ksh/tap/month for every rural area. This system weakens the water supply project, and the donor or GOK will continuously have to fund for the water supply project because of inadequate care for the facility. A water meter shall be installed

in the early stages and the responsibility to take care of the water meter shall belong to the customer.

This kind of project as mentioned above should extend from Marigat location to other locations, and Mukutani location should be last priority because of natural phenomena, lifestyles and the existence of a present water supply facility.

In Lower Mukutani, at initial stage, it is necessary to introduce the rehabilitation work on pan reservoirs to the community, because the expansion of water supply facilities will be behind other locations. Then, a rehabilitation work on Lekiricha Pan will be carried out as one of verification project in Rugus.

Construction of the pan reservoirs have already been implemented in and over the Study Area with the assistance of NGOs/GOK as an alternative the source of safe drinking because the groundwater along the Rift Valley is not suitable for domestic purpose due to high fluoride content. The function of pans, however, is decreasing due to the reduction of water saving capacity because of sedimentation in the reservoir which has been accumulating to lack of maintenance work for a long time. Then, the probability of sustainable maintenance for the pan by the community beneficiaries was tried as verification project through the rehabilitation work of the pan rather than investing in new pan elsewhere.

Though the rehabilitation work was once completed by manual labor and machine, maintenance work by community has not been done and silting is again proceeding at a faster rate. This is because men have to take their animal far away during dry season, which is the most suitable time for desilting. Accordingly, the pan committee lost its function as they were busy looking for their own food supplies. People here have to be engaged in various activities such as animal herding, farming, etc. for their survival. Under this circumstance, it is evaluated that the sustainable maintenance of the pan by the community in such diversified nature seems very difficult. The periodical input such as “Food for work”, therefore, is indispensable thing in this area.

On the other hand, in Upper Mukutani, the domestic water supply facility (as pipeline system) was constructed at Iberesati village as one of the verification project. In this area, two tribes live, namely Il Chams and Pokot. However, they are in conflict over the delineation of their territory. In this pipeline system, the water source (inlet facility) is located in Il Chams territory while the supplement point (outlet facility) is constructed in Pokot. On this verification project, therefore, it is to be observed whether or not such development like this, with two competing tribes using the same facility, would be able to live peacefully and contribute to social stability. From now on, as next step in this area should come up with a program for operation and maintenance work by the community (by each tribe). The operation and maintenance cost will be met by the water use fee paid by

users. In this area, however, people do not prepare cash at anytime, but save their property in the form of livestock. Therefore, it will be necessary to make an agreement for the method of maintenance including the levying system of water use charge, for instance, the operation and maintenance cost borne by water users should not be charged in a short cycle with small amount but one or two times per year and so on. Concerning the technical transfer for maintenance of facility, the GOK staff (the Department of Water Development) will transfer routine technical work such as assigning the plumbing tools to the community.

Finally, the Kimao dam project should be completed as soon as possible, because while the dam itself has already been completed, the pipe connection work has not yet been started. The reason why this project was stopped is due to inadequate budget allocation, but siltation of the reservoir is already occurring now. The GOK shall look for support organizations who can complete the remaining works of the project.

b) Road Condition Improvement

Road infrastructure is created by the GOK, and maintenance work needs a high budget. Most centers of locations have been connected to each other now, and the demand from the community has switched from new road construction to improvement of the roads. The demand for road improvement includes the need for the faster transportation of patient and trading goods. The Matatu is useful for human transportation and travel frequency depends on the number of customers, so its frequency to the eastern and southeastern areas of the Study Area is naturally increasing gradually. The Matatu also can be used for the transportation of small goods - small and valuable trade goods can increase the frequency of transportation.

Transporting livestock is a problem in the Study Area, especially in the southeastern and eastern parts of Baringo Lake. If the livestock is transported on foot over a long distance, the animals become thinner and their value decrease. For this reason, road improvement of routes in Marigat-Arabal and Marigat-Mukutani should be given top priority. From this back ground, on 12th October 1999, there was a pre-caution notice from the Ministry of Roads and Public Works, concerning the gravel pavement of the road from Marigat - Arabal - Mochongoi (C 51) and others. Construction of the road of C51 with gravel standard is on-going at present.

After finishing the above improvement work, a new loop will be made, which will connect Nakuru - Marigat - Arabal - Mochongoi – Nakuru. Marketing conditions from the eastern and southeastern parts of Baringo Lake will therefore improved. The community in these areas can select auction places convenient to them. The road condition of a route from Loiminang to Komolion will remain in its present earth road state for the time being: the people in Rugus sub-location have not much need or opportunity to sell their livestock compared to other places. On the other hand, the people of Kiselian location need

opportunities to sell their livestock, so the route in this location should be improved.

c） Electricity Service Expansion

Electricity with a capacity of one Mega VA for new customers, is currently available in Kimalel, Salabani, Marigat, Ngambo, Loboi and Kapkuikui locations. Basically, the extension of electricity depends on the demand. Urbanization will make demand increase and this will be done by the Kenya Power and Lighting Corporation (KPLC). The customer shall pay part of the extension cost which depends on the scale of extension. Considering population and economic activity, the next locations for electricity extension will be Sandai, Kiserian and Salabani locations.

d） Telephones Service Expasion

There are 234 telephone lines for new customers around Marigat, Salabani, Loboi and Kapkuikui locations. The customer shall pay the whole cost of their extension, and Telkom Kenya will do the extension work. Pay phones are under construction from Loboi to Sandai location with investment by Telkom Kenya, and coin box extension project for each location shall be prioritized.

Table 6.5.8 Implementation Schedule of Infrastructure Development Plan

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
Agricultural Infrastructure				
1. Catchment Water Resource Assessment	**Short Term (1-5 years)** - Rehabilitate present measuring facilities (Water level, Rainfall gauge etc.)	Main Rivers, Lake Baringo basin	Discharge; Perkera R., Molo R., Waseges R., Ol Aeabal R. Rainfall; Eldama Ravin, Molo, Kabarnet, Marigat, Elburgon Sta.	MOENR, Donors
	- Prepare equipment for a water resource assessment (Water level, Rainfall gauge etc.)	-do-	-do-	MOENR, Donors
	- Investigate and survey water abstraction condition in a catchment area	-do-	Get the fundamental data for analysis of the water resource assessment	MOENR, Community
	- Collect and process data for water resource assessment	-do-	-do-	MOENR
	Mid Term (6-10 years) - Investigate and survey water abstraction condition in a catchment area	Main Rivers, Lake Baringo basin	-do-	MOENR, Community
	- Collect and process data for water resource assessment	-do-	-do-	MOENR
	- Assess available quantity of water for irrigation and others	-do-	Analyze the water resource assessment	MOENR
	Long Term (11-20 years) - Investigate and survey water abstraction condition in a catchment area	Main Rivers, Lake Baringo basin	-do-	MOENR, Community
	- Collect and process data for water resource assessment	-do-	Get the fundamental data for analysis of the water resource assessment	MOENR

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	- Inspect and survey new water resources and propose new water use plan	-do-	-do-	MOENR
2. Strengthen of Water Authority	**Short Term (1-5 years)** - Re-organize the water authority in Baringo Lake catchment area	Water users arround Lake Baringo basin	Train in oorganizatio nal and leadership skills	MOENR
	Mid Term (6-10 years) - Review the water right and water abstraction quantity	Lake Baringo basin	Recognizatio n of the water right in each users and prevention of illegal water abstraction	MOENR, Community
	- Decide the water charge for business and commercial use (big water abstraction scheme)	Water users arround Lake Baringo basin	The water charge would be used for the water resource conservation	MOENR
	- Allocate catchment conservation budgets by using water charge and deliver it	Water users arround Lake Baringo basin	-do-	MOENR
	Long Term (11-20 years) - Examine a new water resource for irrigation and other purpose, and to review and re-allocate water quantity according to water resource assessment	Lake Baringo basin (especially, Perkerra & Molo River)	Development of new water resources considered water resource assessment and environment of the study area	MOENR, Community
3. Water Management	**Short Term (1-5 years)** - Improve irrigation facilities for effective water use (Perkera, Eldume, Sandai, Kamoskoi Irrigation Schemes)	4 schemes	Lining of canal, Installation of gate etc.	Community, MOENR, Donors
	Mid Term (6-10 years) - Organize water management organization and plan of their actvities	Water users arround Lake Baringo basin	Strengthen water associations	Community, MOENR,

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	- Allocate water abstraction quantity to each customer among community through holding workshops	Water users arround Lake Baringo basin	Recognizatio n of the water share in each users	MOARD
	Long Term (11-20 years) - Review and re-allocate of water abstraction quantity according to the results of water management activity and water resource assessment	Lake Baringo basin	Recognizatio n of the water share and the effective water use in each users	Community, MOENR
	- Try to improve an irrigation facility again for more effective water use	Water users arround Lake Baringo basin	Lining of canal, Installation of gate etc.	Community, MOENR
Rural / Social Infrastructure				
1. Water Supply	**Short Term (1-5 years)** - Increse a number of water supply facility in the center of each location (Phase I)	Marigat D.	8 pipe lines for center of location	Community,
		Mukutani D.	3 pipe lines for center of location	MOENR,M OARD NGOs, Donors
	- Rehabilitation pan reservoir by community	Marigat D.	16 pans	Community, MOENR,M OARD
		Mukutani D.	14 pans	NGOs, Donors
	Mid Term (6-10 years) - Extend water supply facility, its number and capacity (Phase II)	Marigat D. Mukutani D.	Pipe lines and Pans	Community, MOENR,M OARD NGOs, Donors
	Long Term (11-20 years) - Improve water quality of water supply by mixing with good quality of water (Phase III)	-do-	To get the safety water including for livestock	Community, MOENR,M OARD NGOs, Donors
2. Road Condition Improvement	**Short Term (1-5 years)** - Improve Divisional Trunk Road condition (C51, Marigat-Arabal-Mochongoi, improvement from earth road to gravel road)	Marigat D., Mukutani D., (Mochongoi D.)	L=62 km	MORPW

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	- Usual routine maintenance work (grading)	Marigat D., Mukutani D.,	L=45 km	MORPW
	- Usual routine maintenance work (patchwork for bitumen pavement)	-do-	L=10 km	MORPW
	Mid Term (6-10 years) - Improve secondary and minor road condition (E460/D365, Loboi-Mukutani-Tangulbei, improvement from gravel road to bitumen road)	Marigat D. Mukutani D.	L=70 km	MORPW
	- Usual routine maintenance work (grading)	-do-	L=45 km	MORPW
	- Usual routine maintenance work (patchwork for bitumen pavement)	-do-	L=10 km	MORPW
	Long Term (11-20 years) - Improve minor road condition (E1,424 and E1,423, Longorwa-Ngambo-Kampi ya Samaki, Kiserian-Rugus-Komolion, improvement from earth road to gravel road)	Marigat D. Mukutani D.	L=67 km	MORPW
	- Usual routine maintenance work (grading)	-do-	L=45 km	MORPW
	- Usual routine maintenance work (patchwork for bitumen pavement)	-do-	L=10 km	MORPW
3. Electricity Service Expansion	**Short Term (1-5 years)** - Expand service for customers in three electricity distributions, Loboi, Marigat and Kampi ya Samaki	Loboi L., Marigat L., Kampi ya Samaki	Each center of location	Customer, KPLC
	Mid Term (6-10 years) - Establish new electrical distribution in Sandai location	Sandai L.	Center of location	Customer, KPLC
	Long Term (11-20 years) - Establish new electrical distribution in Kiserian and Salabani locations	Kiserian L. Salabani L.	Each center of location	Customer, KPLC
4. Telehone Service Expansion	**Short Term (1-5 years)** - Set up coin box telephone at the center of locations (Sandai, Ngambo, Eldume)	Sandai L., Ngambo L., Eldume L.	The number of coin box tel. should be decided according to reserch in the each location	Customer, Telkom Kenya
	Mid Term (6-10 years) - Expand service for official and private customers in two telephone exchanges	Marigat L. Kampi ya Samaki	234 lines can be used now	Customer, Telkom Kenya

Project/ Program	Activities	Area/Location /Organization	Target	In Charge
	Long Term (11-20 years) - Expand service for official and private customers in two telephone exchanges	-do-	234 lines can be used now	Customer, Telkom Kenya
	- Expand new telephone exchanges in Kiserian	Kiserian L.		Customer, Telkom Kenya

6.5.7 Rural Health and Sanitation Development

1) Understanding

1.1) Empirical Wisdom

Generally, local inhabitants are considered experts in rural life. They have significant wisdoms regarding survival in ASAL environment. They know how to quench their thirst, how to avoid disease, and how to treat patient. They have a kind of medical science based on their daily experiences. For instance, anatomy of dead livestock contributed to their understanding of internal organs. They have classified causes of diseases into four categories. External conditions such as cold wind that blows into a child head; infectious agents, although they may not have seen them directly; constitutional or genetic defect; and lastly spiritual reasons. The variety of their herbal medicines easily exceeds 200.

It is a common belief among them that a pool of water left over upon a dried-up riverbed, or in contrast, a very first splash of water after dry-season would cause diseases. When fetching water, they dig a small-hole on the riverbed beside a stream, and wait for some "filtered" water come-up inside the hole instead directly from a stream. They watch the water quality and surroundings carefully. They are quite sensitive to any smell, color or taste change, dead fish, oil and any other contaminants. They are equipped with those safety sensors as a naturally given human capacity, but not with a modern microbiology. For instance, detecting existence of Vibrio Cholera in their water source is totally beyond their capacity.

1.2) Epidemiological Background

Infectious diseases are major burden of diseases in the area.

Major outbreaks

- Cholera; '99, '98, '95, '90, '88, '83, '81
- Malaria; '00
- Yellow Fever; '93
- Meningitis; '92

Endemic

Malaria, URTI, intestinal parasite, Amoebiasis, etc. And nutritional disorders.

Through the discussion with local health staffs, it becomes clear that there are some 21 identified infectious diseases around the area. Namely;

Amoebiasis*	Leishmaniasis	Schistosomiasis*
Anthrax	Malaria	Shigellosis*
Ascariasis*	Meningitis	Tetanus
Brucellosis	Pneumonia	Trypanosomiasis
Chickenpox	Rabies	Tuberculosis
Cholera*	Respiratory disease	Typhoid fever*
Hookworm disease	Scabies	Yellow fever

Among those diseases, Anthrax, Brucellosis, Rabies, Tetanus, Trypanosomiasis and Tuberculosis are defined as 'Cattle association diseases' or 'Zoonosis'. In order to control these diseases, both human and animal health programs should be considered in closely related interventions. It should be noted that those marked with (*) are categorized as waterborne diseases.

Demographic database is rather weak. Currently no reliable information on population by sex and age group are available. Therefore estimates on some important health indicators such as IMR, MMR, TFR, and Life Expectancy are difficult.

1.3) PHC Strategy

PHC[1] is the strategy agreed worldwide to achieve "Health For All" as the ultimate goal. Analyzing past failures of PHC realization in the international health fields, one key factor is weak interactions between a health institution and a community. Often the distances are so far (physically, socially as well as psychologically) that health staffs, particularly those who are engaged in public health, are demoralized to communicate with a community. In this context, the interaction between the Marigat Health Centre and the communities has become a major focus of PHC in Baringo.

The Marigat Health Centre consists of three departments; clinic, public health and DVBD laboratory. Each department provides respective health services. Communities are benefited from them and responding to the departments with joy.

[1] There are two imprecations in PHC; comprehensive PHC and selective PHC. The comprehensive PHC implies a kind of ideology that health belong to each person, not to a hospital or an academic institute.

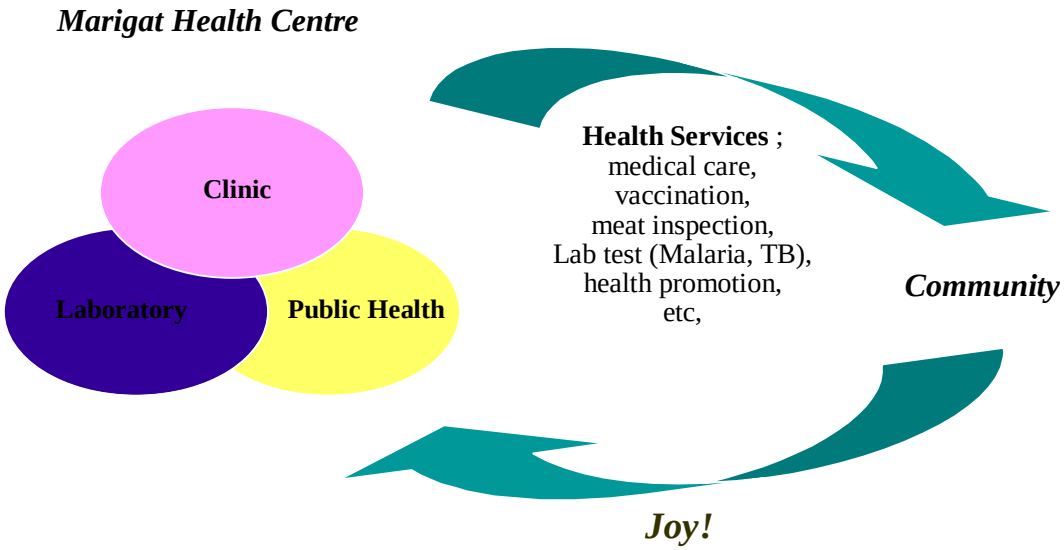


Figure 6.5.11 Conceptual Overview of PHC Interaction

2） Strategy

The two strategies have been taken into account in formulating this master plan.

1. Comprehensive PHC concept, and
2. Burden of diseases on the communities

The comprehensive PHC strategy will be realized by introducing the interactive and dynamic mass communication tactics. Our verification project, which applied digital graphics technology for the slideshow as a communication media, has shown significant modal change in relation to target communities and health staffs, as well as inter-cooperation among clinic, public health and laboratory. As well as the slideshow with digital graphics technology, other communication media such as message board, local radio program, news letter, school health program, community meeting (baraza), MCH card, mother's class, inter-exchange of BI station activity can be utilized to realize the strategy.

Burden of diseases study is an essential component in order to obtain optimum health resource allocation in a scientific manner, using DALY or other appropriate indicators. The necessary four categories are the following:

1. Reliable database on demography and epidemiology
2. Information on all available resources which can be used for the health activities; including Governmental, non-governmental, outside donors, etc.
3. Information on health institutions and policy
4. Information on the cost-effectiveness of treatment, the prevention technology,

and so on.

3） Development Plan

3.1） Short-term

a） Towards PHC Laboratory

The MHC laboratory is now capable to identify pathogenic agent or bacteria in the public water sources. This activity should be extended further until routine regular monitoring system is established. Early warning functions should also be extended.

b） Epidemiological Investigation Capacity Building

Marigat health Centre should be capable to investigate epidemic mechanism of major outbreaks by interactive cooperation with clinic, laboratory and public health.

c） Communication on Health Matters

The MHC and neighboring dispensaries should be capable to disseminate epidemic and other health information regularly through various media such as; school program, radio, bulletin board, community meeting.

d） Revitalize BI stations in the area.

The successful experiences in Sandai BI could be a model for the others.

e） Empirical Wisdom Integration

Invite traditional healers to participate in health massage formulation.

f） Database for Burden of Diseases Study[2]

The maintenance of statistics on death by sex, age, cause, and Statistics by disease, onset age, prevalence period, prevalence rate, and Information about the cost of the countermeasure program with close consultation with central health statistics department should be improved.

3.2） Middle-term

a） Continuous Training for Health Staffs

Provide training for activities, responsibilities as a member of health team toward all kinds of health personnel, includes medical student, both inside and outside of the hospital. Motivate staff to do health activities in the society. Analyze health condition of the

[2] GLOBAL COMPARATIVE ASSESSMENTS IN THE HEALTH SECTOR, C.J.L. Murray & A.D. Lopez, WHO 1994

community. Learn how to show concern to the community or individuals. Learn education, enlightenment, the method of offering services, and so on. Learns to oriented toward the needs of the community without shutting itself up in the classroom or a hospital ward.
The training should aimed at all health personnel to improve the prevention of disease, increase in health, treatment for disease, rehabilitation activities toward the problem in health arising in the daily life. An actual problem should be placed on the target beyond fixed theory or dogmatic idealism.
Re-train all existing health personnel, for maximizing their performances within the restructured whole health system targeting PHC. As a principle, a specific health service should be done by the personnel who took the minimum training to provide that service.

b） PHC Research

A sub-district hospital should be located near to the community, geographically, as well as mentally. Therefore, it expects that it is concerned actively with the research related to the method for proper technology for the health, its practical application to the people, to most effectively and efficiently in that area, and the behavior style as a alternative plan.

c） Activate Community in Health

Encourage the community to make decision for the community. Promote healthy habit, discourage unhealthy habit, maximize health service achievement, aggressively interact with a community with orientation for ownership and sustainability. Provide accurate information for health, which isn't to be confused with rumor and superstition, and appropriate method to the public. Cooperating with other groups for food production or rural development, to tackle to solve the problem of nutrition, population, environmental health, and safe water.

d） PHC promotion

Prepare basic equipment of surgery, internal medicine, pediatrics, obstetrics and gynecology in the Marigat sub-district hospital, then accept referred patient from health Centres and dispensaries.

For both community and PHC health worker; to instruct, to advise, and to give technical support for every daily health problems; to provide health education; to follow up discharged patient; to monitor health program.

Support for health planning of the area, whether to organize the health system of the area and how. The way of managing these systems in the best way should be shown, and evaluation should also be done, too.

Provide all necessary means for health Centre and dispensary; medical supply, provision of transportation, communication, spare parts for equipment and maintenance.

e） Role of sub-district hospital

It should have clearly defined catchment area or defined population. It is a precondition for achieving control mechanism for health activity by the local community, by which they can design community's needs- oriented health service. For close communication with its catchment area society, the Marigat sub-district hospital must have a department for local health. The department's roles are summarized as follows:

- Support PHC program
- Re-train health personnel
- Cooperate with supervisors for PHC workers
- Identify the local health issues and its solution in collaboration with local community
- Receive referred patient from health Centre or dispensary, and to supply drugs
- Cooperate with local women's union, NGOs, agricultural cooperatives, industrial sector so on
- Identify gaps between existing PHC service and reality, then introduce new countermeasure
- Encourage research activity on the themes of extension of appropriate technology
- Re-orient the hospital by establishing the department for local health, then to increase PHC budget within hospital

3.3） Long-term:

Health For All

a） Establish clear commitment to PHC at the policy level.

b） Orient by cooperation with representatives of local people and every level of governmental body; As a case, existing Health Centre Development Committee (HCDC) consisting of local health staff and representatives of the local people can be utilized for smooth running of health facilities. HCDC has a role to link between the health Centres and communities. It seems, however, that HCDC activity is not so influential under the circumstance that the comprehensive PHC has not been realized. The role of HCDC will be clarified and enhanced by the closeness between the health Centres and local people, as the results of the verification project in Marigat Health Centre indicate.

c） Available health resource, especially for PHC program, should be enforced.

- Increase the share of PHC within total health budget.
- Utilize all kinds of health resources efficiently.
- Raise new fund from international society or local community.
- Re-orient the hospital by establishing the department for local health, then to increase PHC budget within hospital

- Change the proportion of health personnel both number and job variation by enforcing human resources at community and middle level.

d) Training institution for health will take a curriculum that emphasize local needs as its Centre issue.

e) The Ministry of Health will share widely the information on the role of hospital in Health for All.

4) Implementation

The development plan will be carried out by MOH as well as the health Centres closest to the local people and the local people are also the crucial stakeholders. The PHC promotion will also be effectively implemented with inter-sectoral or inter-ministerial collaboration. As shown in Figure 7.1.1 in Chapter 7, Inter-Ministrerial Advisory Committee as well as District Advisory Committee will be formulated to implement the development plan. Relevant institutions should be involved in the PHC promotion in this line, on the course of the implementation.

Table 6.5.9 Implementation Schedule of Rural Health and Sanitation Development Plan

Project/ Program	Activities	Area/ Location/ Organization	Target	In Charge
Short Term (1-5 year)	- Towards PHC Laboratory	Marigat	Water source investigation in every week	MOH
	- Epidemiological Investigation Capacity Building	Marigat	Epidemiological investigation on every major outbreak	MOH
	- Communication on Health Matters	Marigat & Mukutani D.	Public meeting/every month/community	MOH
	- Revitalize BI stations in the area	Marigat & Mukutani D.	7 BIs revitalized	MOH
	- Empirical Wisdom Integration	Marigat & Mukutani D.	Monthly communication with traditional healers	MOH
	- Database for Burden of Diseases Study	Marigat & Mukutani D.	Demographic database, and disease statistics	MOH
Mid Term (6-10 year)	- Continuous Training for Health Staffs	Marigat & Mukutani D.	PHC training for every health staff/every year	
	- PHC Research	Marigat & Mukutani D.	20 practical researches/year	Marigat HC, MOH, Kenya Medical Research Institute (KEMRI)
	- Activate Community in Health	Marigat & Mukutani D.	Health board meeting/monthly/community	Marigat HC, MOH

Project/ Program	Activities	Area/ Location/ Organization	Target	In Charge
Mid Term (6-10 year)	-			
	- PHC promotion	Marigat & Mukutani D.		Marigat HC, MOH
	- Role of sub-district hospital	Marigat	a department for local health established	Marigat HC, MOH
Long Term (11-20 year)	- Establish clear commitment to PHC at the policy level	Baringo and central		MOH
	- Orient by cooperation with representatives of local people and every level of governmental body	Baringo and central		Marigat HC, MOH
	- Available health resource, especially for PHC program, should be enforced	Baringo and central		Marigat HC, MOH
	- Training institution for health will take a curriculum that emphasize local needs at its Centre issue	Baringo and central		MOH
	- The Ministry of Health will share widely the information on the role of hospital in Health for All	Baringo and central		MOH
	- Empirical Wisdom Integration	Marigat & Mukutani D.	Monthly communication with traditional healers	MOH
	- Database for Burden of Diseases Study	Marigat & Mukutani D.	Demographic database, and disease statistics	MOH