

**JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)**

**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT  
(MOARD)**

**THE STUDY  
ON  
THE INTEGRATED RURAL DEVELOPMENT PROJECT  
IN  
THE BARINGO SEMI ARID LAND AREA  
(MARIGAT AND MUKUTANI DIVISIONS)  
IN  
THE REPUBLIC OF KENYA**

**FINAL REPORT**

**APPENDIXES  
(VERIFICATION STUDY)**

**MARCH 2002**

**SANYU CONSULTANTS INC.**

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**I. VERIFICATION PROJECTS  
(PLANNING STAGE)**

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Figure I.1-1

**Verification Project ① Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases**

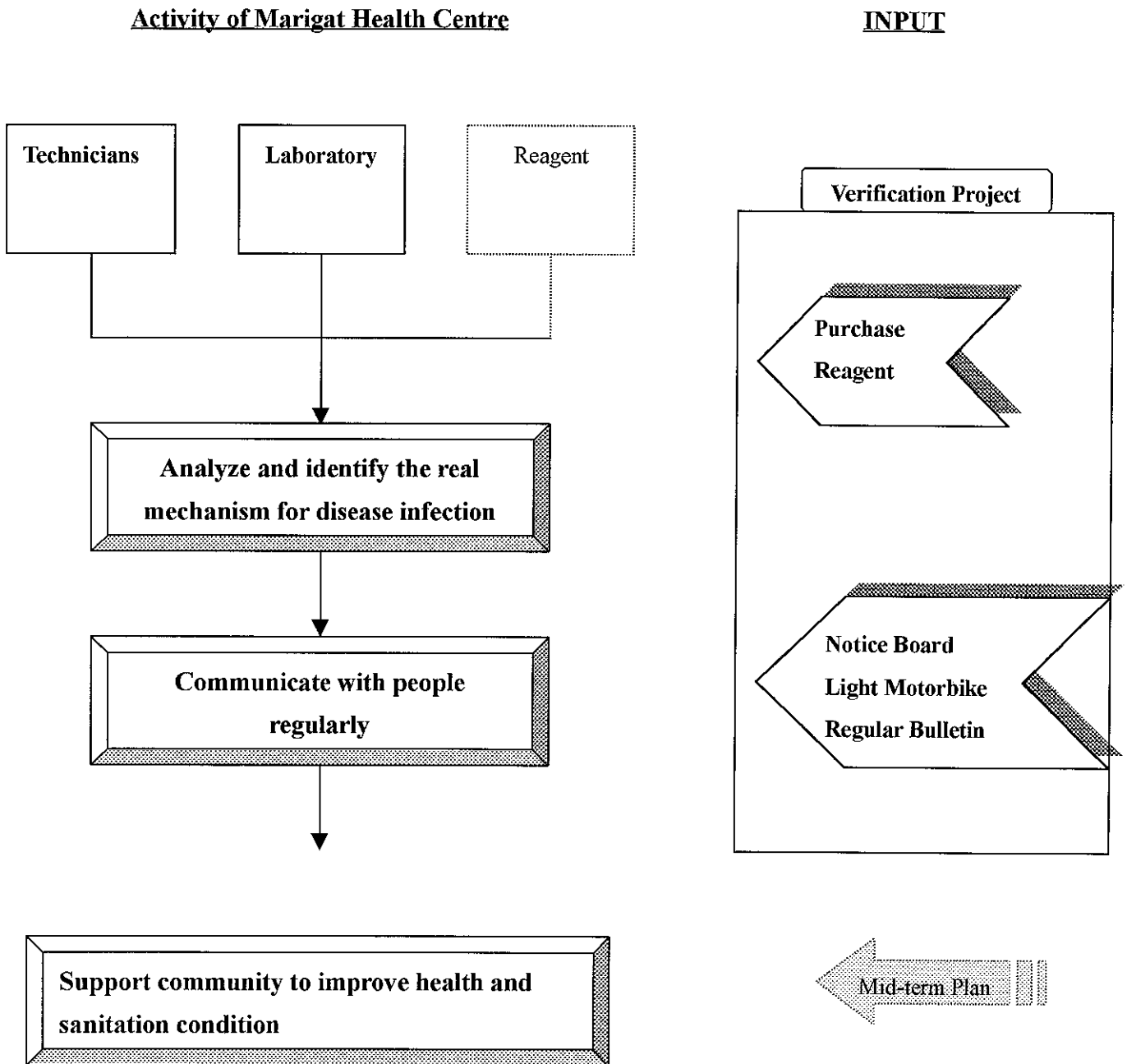
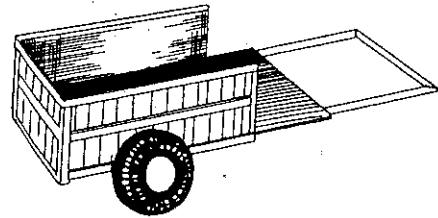
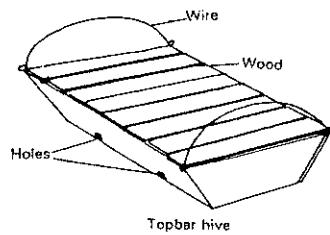


Figure I.1-2

## Verification Project ② Strengthening of Marigat Youth Polytechnic

1. New Items for the Woodworking Course at Marigat Youth Polytechnic (Making of KTBH, Cart)
2. Invitation of Trainer
3. Supply of Equipment
4. Schooling
5. Demonstration of Tools Made by the School
6. Organize People to try to use cart and provide KTBH to bee-keeping group



Demand of KTBH will be expected to increase by the Development Plan  
Cart will be utilized in the community activities

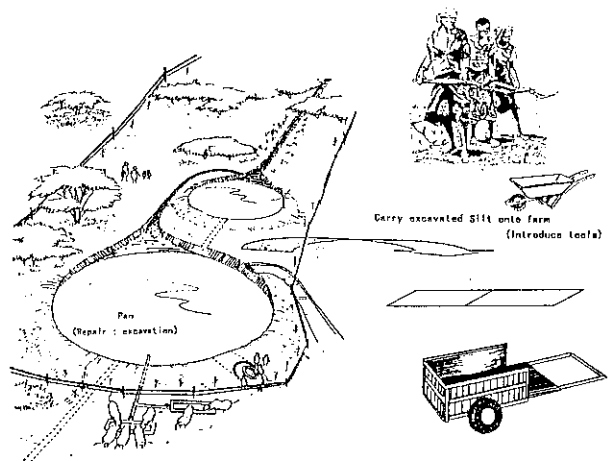
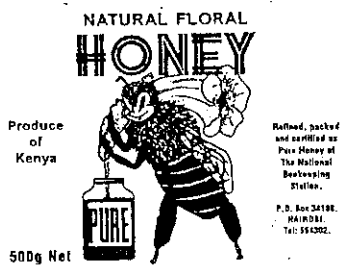
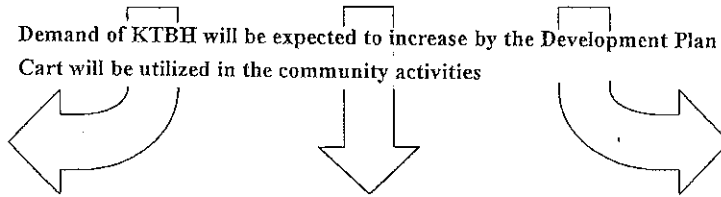


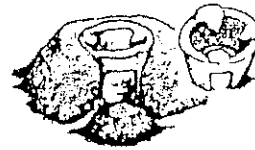


Figure I.1-3

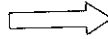
Verification Project ③ Improved Stove + Small Scale Industry  
(Bee-keeping, Fish Processing)



Traditional Stove



Improved Jiko



*Increase of heat efficiency* → *Forest conservation*  
*Saving of firewood*  
*Saving of labor for fetching* → *Shifting of labor*  
*firewood by women* → *into small scale industry*



<Bee-keeping>

Construction of refinery → Sell crude honey to Nakuru, Nairobi

Marketing → Packaging improvement (Whisky bottle → Special container), Advertisement (designing label, etc.)

Training for leaders, accountant, honey making

<Fish Processing>

Improved Jiko ( Fry fish ) → Saving of firewood → Cost reduction

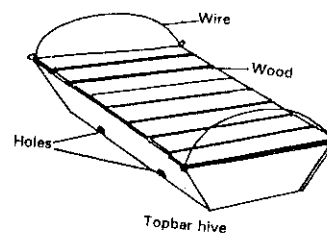
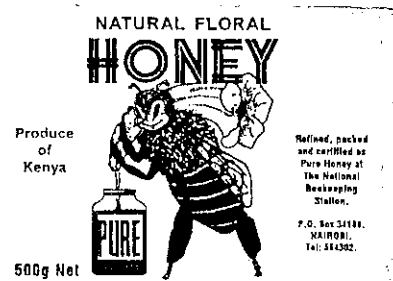


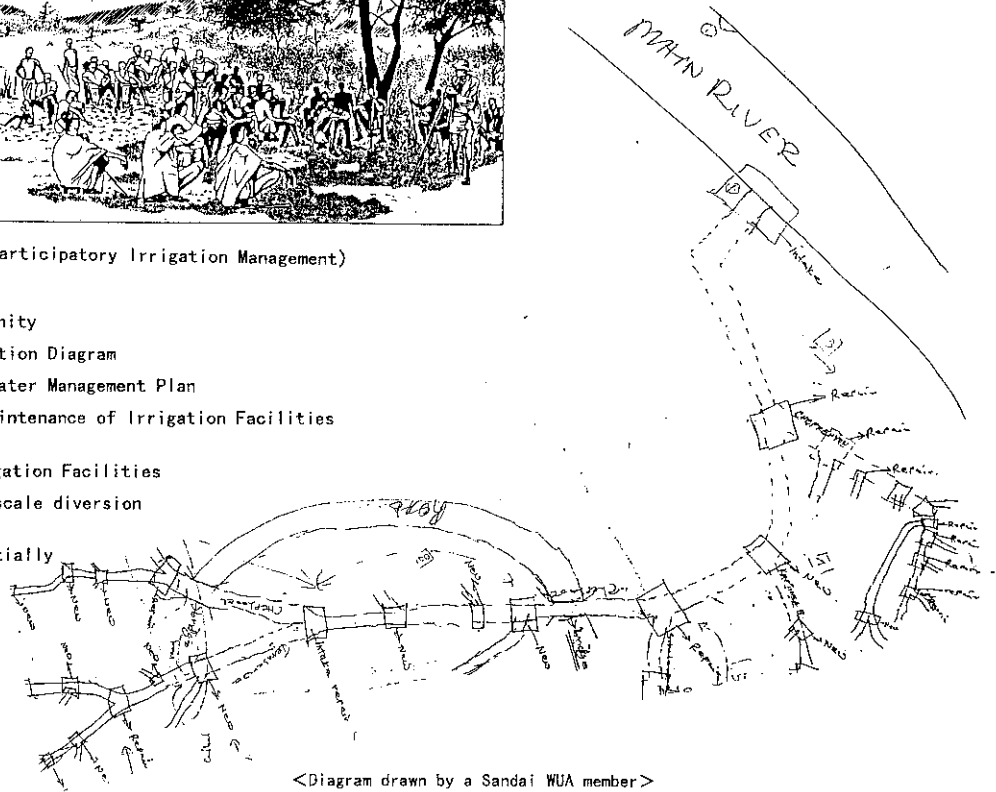
Figure I.1-4

Verification Project ④ Communal Resource Management (PIM+Livestock Improvement)



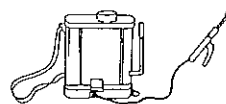
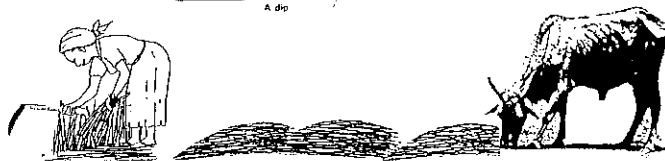
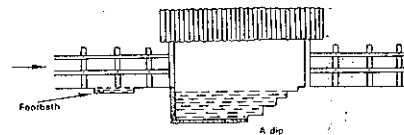
PIM (Participatory Irrigation Management)

1. Activities by community
  - Making of Irrigation Diagram
  - Formulation of Water Management Plan
  - Operation and Maintenance of Irrigation Facilities
2. Improvement of Irrigation Facilities
  - Construct small scale diversion boxes and gates
  - Lining canal partiallyly
3. Water saving agriculture
  - Land leveling
  - Introduce quality seeds



<Livestock Improvement>

- 1) Animal Health Control
  - Rehabilitate dip
  - Introduce sprayer
  - Reorganize dip community



- 2) Livestock Up-grading
  - Promote cross breeding System
  - Promote castrating system
  - Promote cut and carry system (utilize by-product of crops)

Figure I.1-5

Verification Project ⑤ Rehabilitation of Pan

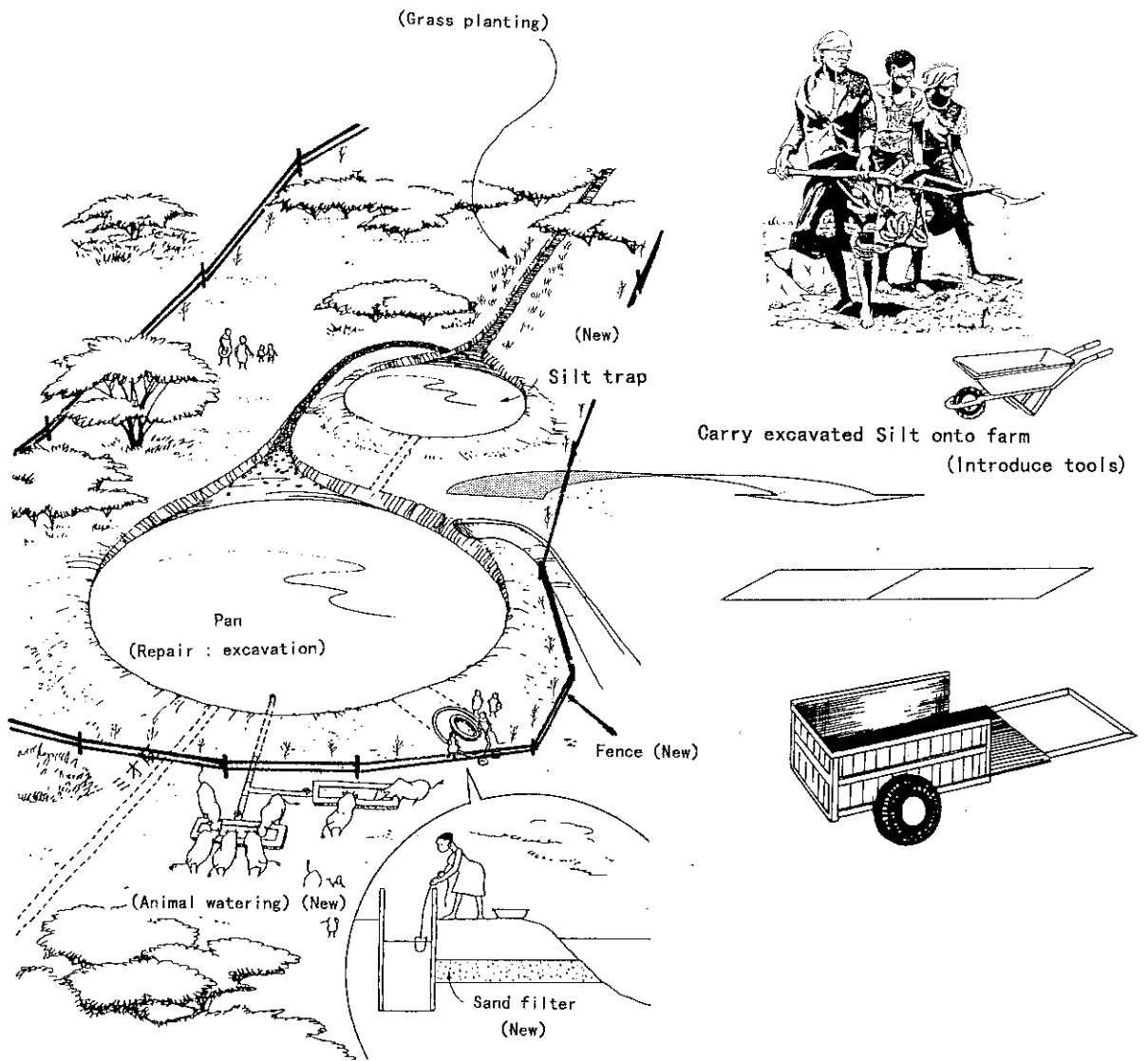


Figure I.1-6

Verification Project ⑥ Food Security (Livestock Improvement + Rain Water Harvesting)

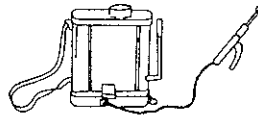
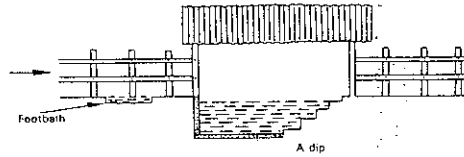
1. Livestock Improvement

1) Animal Health Control

- Rehabilitate dip
- Introduce sprayer
- Reorganize dip community

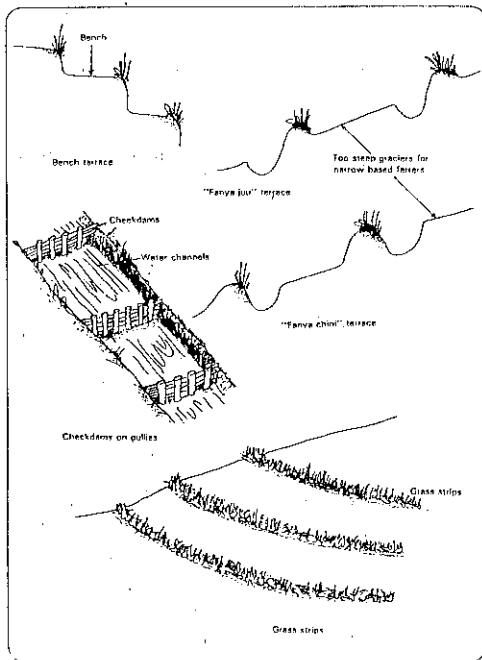
2) Livestock Up-grading

- Promote cross breeding System
- Promote castrating system
- Promote cut and carry system (utilize by-product of crops)



2. Rain Water Harvesting

- Construct small canal
- Construct terrace
- Construct silt trap
- Fencing
- Increase Millet, Sorghum



Structural Measures of Conservation

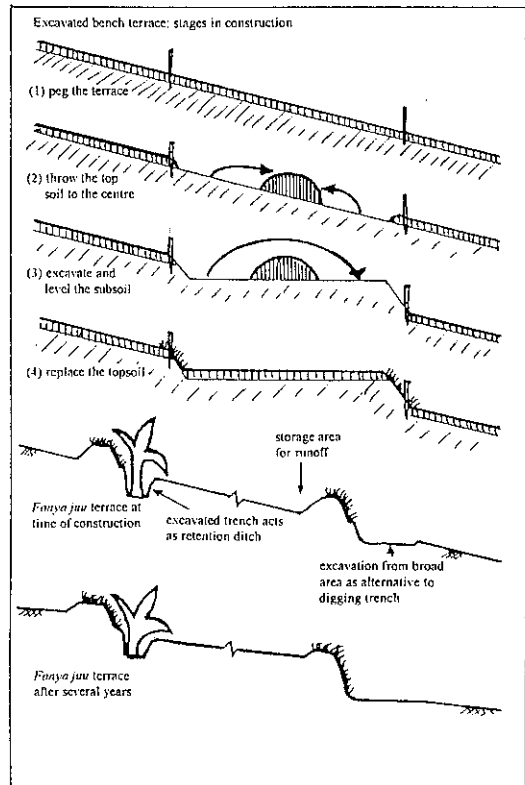


Figure I.1-7

Verification Project ⑦ Learning from Best Practices



Kerio Valley : SARDEP Project (Presentation on the Rural Water Supply Project by community members)



Kitui District : JICA Forestry Extension Model Development Project for Semi Arid in Kenya

Table I.1-1 Task Allocation of Verification Project

Component of Verification Projects: Strengthening of Marigat Health Center				
Work progress	Community	Local Consultants/NGOs	Relevant GOK Administrations	JICA
1. Preparation	<ul style="list-style-type: none"> <li>- Gathering together to discuss project</li> </ul>	<ul style="list-style-type: none"> <li>- Support in community mobilization</li> </ul>	<ul style="list-style-type: none"> <li>- Ministry of Health, Department of Vector Borne Diseases</li> <li>- Marigat sub-district hospital</li> </ul>	<ul style="list-style-type: none"> <li>- Equipment and reagent supply</li> </ul>
2. Implementation	<ul style="list-style-type: none"> <li>- Community health meeting</li> <li>- Activation of village health committee</li> </ul>	<ul style="list-style-type: none"> <li>- Support in community mobilization</li> </ul>	<ul style="list-style-type: none"> <li>- Bacteriological investigation of water resources (DVBD)</li> <li>- Epidemiological investigation for past outbreaks</li> <li>- Organization of appropriate message</li> <li>- Public relations</li> <li>- School health education (Ministry of education)</li> </ul>	<ul style="list-style-type: none"> <li>- Technical assistance</li> </ul>
3. Monitoring	<ul style="list-style-type: none"> <li>- Gathering together to discuss project</li> </ul>	<ul style="list-style-type: none"> <li>- Participatory monitoring procedure</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring impact of messages</li> </ul>	<ul style="list-style-type: none"> <li>- Technical assistance</li> </ul>
4. Evaluation	<ul style="list-style-type: none"> <li>- Discussing and agreeing on evaluation procedure</li> </ul>	<ul style="list-style-type: none"> <li>- Participatory evaluation procedure</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate change of hygiene practice</li> </ul>	<ul style="list-style-type: none"> <li>- Technical assistance</li> </ul>

Table I.1-2 Task Allocation of Verification Projects.

Component of Verification Projects: Strengthening Marigat Youth Polytechnic

Work Progress	Community	Relevant GOK Administrations	Local Consultants/NGOs	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- Determine the problems facing the institution in a PCM workshop</li> <li>- Assist the management committee to restructure</li> <li>- Draw up a business focused plan of action</li> </ul>		<ul style="list-style-type: none"> <li>- Facilitate the management committee to establish the polytechnic through a PCM workshop</li> <li>- Assist management committee to draw up a business focused plan of action</li> </ul>	
2. Implementation Stage	<ul style="list-style-type: none"> <li>- Initiate and implement income generating projects</li> <li>- Design short-term courses (module)</li> <li>- Implementation of new training modules</li> </ul>		<ul style="list-style-type: none"> <li>- Design short-term courses (module)</li> </ul>	<ul style="list-style-type: none"> <li>- Equip polytechnic with appropriate equipment</li> <li>- Support new project on income generation</li> </ul>
3. Monitoring Stage	<ul style="list-style-type: none"> <li>- Monitoring of progress</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of progress</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of progress</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of progress</li> </ul>
4. Evaluation Stage	<ul style="list-style-type: none"> <li>- Evaluation of the project</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluation of the project</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluation of the project</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluation of the project</li> </ul>

Table I.1-3

**Task Allocation of Verification Projects****Components of Verification Projects: Environmental Conservation (Promotion of Improved Stove)**

<b>Work Progress</b>	<b>Community</b>	<b>Relevant Administrations</b>	<b>Local Consultants/NGOs</b>	<b>JICA</b>
1. Preparation Stage		<ul style="list-style-type: none"> <li>- Identify women who are the most suffering from firewood shortage.</li> <li>- Identify the women groups that are eager to introduce improved Jiko.</li> </ul>		<ul style="list-style-type: none"> <li>- Assist the relevant administration in doing the left.</li> <li>- Prepare a progress form to be filled by Local Consultants.</li> </ul>
2. Planning Stage	<ul style="list-style-type: none"> <li>- Organize women groups, composed of 3 to 5 members each</li> </ul>	<ul style="list-style-type: none"> <li>- Facilitate the set up of the women groups.</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare the progress report in a form given by JICA.</li> </ul>	<ul style="list-style-type: none"> <li>- Assist the relevant administration to facilitate the grouping.</li> </ul>
3. Implementation Stage	<ul style="list-style-type: none"> <li>- Chose the leader of the group.</li> <li>- Do study tour for seeing the real improved Jiko.</li> <li>- Collect money for buying the improved Jiko.</li> <li>- Construct the improved Jiko by merry-go-around.</li> <li>- Disseminate the Jiko to neighbors.</li> </ul>	<ul style="list-style-type: none"> <li>- Facilitate the selection of the leaders.</li> <li>- Give the opportunities of showing real improved Jiko to the leaders.</li> <li>- Avail the Jiko by using the money collected.</li> <li>- Disseminate the effective use of firewood, good cooking to reduce firewood, storing firewood during dry season, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Prepare the progress report in a form given by JICA.</li> </ul>	<ul style="list-style-type: none"> <li>- Avail the transportation to be required for taking the leaders to the area where improved Jiko is in use.</li> <li>- Avail the transportation for bringing the improved Jiko to the community.</li> <li>- Assist the relevant administration in doing the left.</li> </ul>
4. Monitoring Stage	<ul style="list-style-type: none"> <li>- Check the amount of firewood used under the improved Jiko.</li> <li>- Check the time to cook.</li> </ul>	<ul style="list-style-type: none"> <li>- Analyze the data collected by local consultants.</li> </ul>	<ul style="list-style-type: none"> <li>- Collect and summarize the data given by the Jiko users.</li> </ul>	<ul style="list-style-type: none"> <li>- Assist the relevant administration for analyzing the data.</li> </ul>
5. Evaluation Stage		<ul style="list-style-type: none"> <li>- Evaluate the impact of the improved Jiko together with JICA.</li> </ul>		<ul style="list-style-type: none"> <li>- Evaluate the impact of the improved Jiko and explore to disseminate the Jiko over the Study area.</li> </ul>



Table I.1-4 Task Allocation of Verification Projects

Component of Verification Project : Small-Scale Industry (Bee-Keeping)

Work Progress	Community	Relevant GOK Administrations	Local Consultants/NGOs	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- Take training course provided by NGOs.</li> <li>- Organize group(s) and elect committee members.</li> <li>- Contribute money to start business.</li> <li>- Take technical training course provided by the staff of National Beekeeping Station.</li> </ul>	<ul style="list-style-type: none"> <li>- Explain about the potential of honey business to the community and identify participants.</li> <li>- Supervise training and election of committee members.</li> <li>- Provide technical information.</li> </ul>	<ul style="list-style-type: none"> <li>- Provide training on leadership quality, gender, awareness building and marketing.</li> </ul>	<ul style="list-style-type: none"> <li>- Provide initial cost.</li> <li>- Prepare detail implementation plan.</li> <li>- Assist activities of GOK and NGO.</li> </ul>
2. Implementation Stage	<ul style="list-style-type: none"> <li>- Contribute labor to construct the building of honey refinery.</li> <li>- Refine and bottle honey.</li> <li>- Sell bottled honey.</li> </ul>	<ul style="list-style-type: none"> <li>- Provide technical information.</li> <li>- Assist to obtain and prepare a space to construct building.</li> </ul>	<ul style="list-style-type: none"> <li>- Supervise and assist the activities of committee members.</li> </ul>	<ul style="list-style-type: none"> <li>- Assist activities of relevant administrations.</li> </ul>
3. Monitoring Stage	<ul style="list-style-type: none"> <li>- Check the number of bottled honey produced and sold.</li> <li>- Check the benefit.</li> </ul>	<ul style="list-style-type: none"> <li>- Analyze the benefit from honey business.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitor the activities of committee members.</li> </ul>	<ul style="list-style-type: none"> <li>- Assist relevant administrations to analyze benefit.</li> </ul>
4. Evaluation Stage	<ul style="list-style-type: none"> <li>- Evaluate the activities of each committee members and other members.</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate the impact of honey project with JICA.</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate the activities of each committee members and other members.</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluate the impact of honey project and explore to apply this business to other areas.</li> </ul>

Table I.1-5 Task Allocation of Verification Project

Component of Verification Project: Participatory Irrigation Management Project (Sandai)

Work Progress	Community	Local Consultants/NGOs	Relevant GOK Administrations	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Explanation of purpose and organization of project and its task allocation to NGOs, GOK and JICA</li> <li>- Explanation and discussion about a number of unskilled labor with NGOs and GOK</li> <li>- Getting agreement for verification project with downstream and neighbor communities.</li> <li>- Plan making to strengthen water user's association</li> <li>- Decision of responsible person to a provision of unskilled labor, and an equipment and material keeper</li> <li>- Plan making of cost sharing and allocation</li> <li>- Plan making of annual work of community</li> </ul>	<ul style="list-style-type: none"> <li>- Traverse survey of canal system and target farmland</li> <li>- Plan making for implementation</li> <li>- Preparation of data collection</li> </ul>	<ul style="list-style-type: none"> <li>- Plan making for land use and cropping pattern</li> <li>- Design and making work schedule of implementation</li> <li>- Provision of a technical assistance to irrigation management to community</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of initial cost</li> <li>- Plan making of water management by using survey results</li> <li>- Discussion with community for cost sharing plan</li> <li>- Provision of study tour to preceding area and procurement tour</li> <li>- Technical assistance for GOK</li> </ul>
2. Implementation Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Strengthen of water user's association</li> <li>- Contribution of unskilled labor works</li> <li>- Hire a gate operator to divert water</li> <li>- Crop planting and better</li> </ul>	<ul style="list-style-type: none"> <li>- Supervision of implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Technical advice for implementation</li> <li>- Advice on water abstraction</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance for GOK</li> </ul>

Work Progress	Community	Local Consultants/NGOs	Relevant GOK Administrations	JICA
	fallow practice - Job simulation by actual responsible person			
3. Monitoring Stage	- Holding workshops - Check of O/M practice - Check of crop growth condition, production and irrigated water quantity - Check of account - Check of affecting condition at downstream and neighbor community	- data collection from community and confirmation of it - Record of monitoring results	- Technical advice to NGOs and community	- Assistance for GOK
4. Evaluation Stage	- Review for initial plan and re-allocation of each task and responsibility - Holding workshops	- Preparation of recommendation what can we learn from PIM in ASAL area through verification	- To record of monitoring results and to prepare recommendation what can we learn from PIM in ASAL area through verification	- Evaluation of the project and make recommendation of possibility for expansion of this kind of project to another Locations or ASAL areas.

Table I.1-6 Task Allocation of Verification Projects		Components of the Verification Project : Improvement of Irrigated Agriculture		
Work Progress	Community	Relevant Administrations	Local Consultants/NGOs	JICA
1 Preparation Stage	- Identification of three sample irrigation blocks(upper to down)	- Traverse survey of canals from main to tertiary canals	- Investigation on problems of water management - Indication of irrigation block on map - survey on on-farm irrigation facilities - Survey on plot boundary and topographic conditions(sample blocks) - Identification of irrigation improvement schemes - Survey on irrigation area by crop by season - Survey on farming practices and possible improvement - Improvement of agricultural supporting services	
2 Planning Stage	- Preparation of implementation plan and cost sharing plan - Plan preparation on on-farm irrigation facilities - Plan preparation on cropping pattern - Plan preparation on improvement of farming practices	- Holding PCM workshops - Evaluation of implementation plan - improvement of agricultural supporting services	- Preparation of technical planning report - Design of project facilities - Planning on precise land leveling	- Assistance to GOK administration for PCM - Assistance to GOK administration for designing
3 Implementation Stage	-Strengthening of Water User' Association - Improve ment of eater management by Water Users' Association and members - Improvement of on-farm irrigation facilities - Improvement of cropping pattern including introduction of high valued crops/varieties - Improvement of farming practices	- Improvement of structures from main to tertiary canals - Precise land leveling - Improvement of agricultural supporting services		
4. Monitoring Stage	- Operation and management of the project	- Holding PCM workshop	- Monitoring of the project	- Monitoring of the project
5. Evaluation Stage	- Operation and management of the project	- Evaluation of the project	- Evaluation of the project	- Evaluation of the project

Table I.1-7 Task Allocation of Verification Projects

Components of Verification Projects: Livestock Project

Work Progress	Community	Relevant GOK Administrations	Local Consultants/NGO's	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- All the community members discuss how they should cope with the matter and deepen their awareness.</li> <li>- To organize farmers association to improve existing systems and form a committee.</li> <li>- Allot a portion of the work each.</li> <li>- Selected community members trained at KARI, RRC, Perkerra, promote a better understanding.</li> <li>- Contribution works</li> </ul>	<ul style="list-style-type: none"> <li>- Assistant for community set-up and capacity building (MOARD)</li> <li>- Holding PCM workshops.</li> </ul>	<ul style="list-style-type: none"> <li>- Attend the PCM.</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance to GOK administration for planning</li> <li>- Assistance to GOK administration for PCM workshops.</li> </ul>
2. Implementation Stage	<ul style="list-style-type: none"> <li>- As the need arise expenses will be shared each association members.</li> <li>- Operation, management and maintenance of the project.</li> <li>- When time has come, hold a joint sale to their animals.</li> <li>- Maintenance of the project.</li> <li>- Record keeping of the project</li> <li>- Assist Evaluation Team</li> </ul>	<ul style="list-style-type: none"> <li>- Conduct of intensive training for the selected farmers. (KARI, RRC, Perkerra)</li> <li>- Design of project facilities</li> <li>- Make a selection advice for materials/equipment.</li> <li>- To provide expertise to animal project management.</li> <li>- Holding PCM workshops</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation and supervision including procurement of materials and equipment.</li> <li>- Monitoring of the project</li> <li>- Attend the PCM.</li> </ul>	<ul style="list-style-type: none"> <li>- Assistant to GOK administrations for designing and selection materials.</li> <li>- Monitoring of the project</li> <li>- Evaluation of the project</li> </ul>
3. Monitoring Stage				
4. Evaluation Stage				

Table I.1-8 Task Allocation of Verification Project  
 Component of Verification Project : Rehabilitation of Pan (Rugus)

Work Progress	Community	Local Consultants/NGOs	Relevant GOK Administrations	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Identification for a number of Pan users in each season</li> <li>- Decision of equipment store place and responsible person</li> </ul>	<ul style="list-style-type: none"> <li>- Explanation of rehabilitation method of Pan through primary school (capacity building).</li> <li>- Plan making for implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Investigation of catchment area where is proposed conservation for Pan</li> <li>- Design and making work schedule of rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of initial cost</li> </ul>
2. Implementation Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Contribution of unskilled labor works</li> <li>- Job simulation by actual responsible users for usual rehabilitation and exchange an opinion with NGOs and GOK (work shop)</li> </ul>	<ul style="list-style-type: none"> <li>- Supervision of rehabilitation</li> <li>- Opinion exchange with community and adjust usual rehabilitation work plan</li> </ul>	<ul style="list-style-type: none"> <li>- Technical advice for rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance for GOK</li> </ul>
3. Monitoring Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Check of participant person in each season</li> <li>- Check of water fetching and desilting frequency</li> <li>- Check of desilted silt quantity</li> <li>- Check of number and damage condition of equipment</li> <li>- Check of plant growth condition of fence</li> </ul>	<ul style="list-style-type: none"> <li>- data collection from community and confirmation of it</li> <li>- Record of monitoring results</li> </ul>	<ul style="list-style-type: none"> <li>- Technical advice to NGOs and community</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance for GOK</li> </ul>
4. Evaluation Stage	<ul style="list-style-type: none"> <li>- Holding workshops</li> <li>- Review for initial plan and re-allocation of each job and responsibility</li> </ul>	<ul style="list-style-type: none"> <li>- Preparation of recommendation what can we learn from rehabilitation of pan in ASAL area through verification</li> </ul>	<ul style="list-style-type: none"> <li>- To record of monitoring results and to prepare recommendation what can we learn from rehabilitation of pan in ASAL area through verification</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluation of the project and make recommendation of possibility for expansion of this kind of project to another Locations or ASAL areas.</li> </ul>

Table I.1-9 Task Allocation of Verification Projects

Components of Verification Projects: Community Organization

Work Progress	Community	Relevant Administration	Local Consultants/NGOs	JICA
1. Preparation Stage	<ul style="list-style-type: none"> <li>- Gathering together to discuss project</li> <li>- Discussing and agreeing on project guidelines, be laws</li> <li>- Registering with Department of Social services and complying with any other legal requirements</li> </ul>	<ul style="list-style-type: none"> <li>- Identify groups that will participate</li> <li>- Mobilize the groups and facilitate their deliberations</li> <li>- Provide guidelines in preparation of by-laws and facilitate registration of the groups</li> </ul>	<ul style="list-style-type: none"> <li>- Support in community mobilization</li> <li>- Group strengthening,</li> <li>- Baseline data-stimulate linkages with other support agencies</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance to GOK and community on workshop procedures</li> </ul>
2. Implementation Stage	<ul style="list-style-type: none"> <li>- Discussing project plan, targets and budgets</li> <li>- Agreeing who will supervise projects works and how</li> </ul>	<ul style="list-style-type: none"> <li>- Provide assistance in interpreting technical requirements</li> <li>- Facilitate understanding of quality control during implementation stage</li> </ul>	<ul style="list-style-type: none"> <li>- Group strengthening</li> <li>- Prepare participatory monitoring format</li> <li>- Group skills upgrading</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance in technical design and implementation</li> </ul>
3. Monitoring Stage	<ul style="list-style-type: none"> <li>- Reaching a consensus on how project will monitored</li> </ul>	<ul style="list-style-type: none"> <li>- Participate in formulating progress indicators alongside local consultants and JICA</li> <li>- Facilitate groups' understanding of participatory monitoring and evaluation</li> <li>- Analyze performance data collected by local consultants</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring data</li> <li>- Other project related data</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance in monitoring</li> </ul>
4. Evaluation Stage	<ul style="list-style-type: none"> <li>- Discussing and agreeing on evaluation procedures</li> </ul>	<ul style="list-style-type: none"> <li>- Assess impact of project interventions in conjunction with JICA</li> <li>- Facilitate participation evaluation</li> </ul>	<ul style="list-style-type: none"> <li>- Participatory evaluation procedures</li> <li>- Project review and re-planning</li> </ul>	<ul style="list-style-type: none"> <li>- Assistance in monitoring</li> </ul>

Table I.2-1 Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases at Marigat Health Centre

	2000												2001			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Monthly Rainfall																
Crop Planting			Maize													
Farming Labour Demand																
High																
Low																
School Term																
Activities of Verification Projects																
1. Marigat Health Center																
1.1 Laboratory equipment setup																
1.2 Water source investigation																
1.3 Epidemiological investigation																
1.4 School program development																
1.5 Public message development																
1.6 Operation of the project																



Table I.2-2 Strengthening of Marigat Youth Polytechnic

	Year													
	Month	1	2	3	4	5	6	7	8	9	10	11	12	2001
Monthly Rainfall														
Crop Planting			Maize						Water Melon					
Farming Labour Demand							Hony Harv.				Hony Harv.			
High														
Low														
School Term														
Activities of Verification Projects														
1. Strengthening of Marigat Youth Poly.														
1.1 Development of curriculum														
1.2 Training for making carts and tools														
1.3 Demonstration and selling the products														
1.4 Study tours to preceding areas														
2. Research for Blacksmith Development														
2.1 Research for present marketing conditions of tools														
2.2 Study on making new tools for agriculture and livestock														

Table I.2-3 Improved Stove + Small Scale Industry at Kampi ya Samaki

	Year													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
Monthly Rainfall	[Rainfall pattern: High in months 1-4, 8-10; Low in months 5-7, 11-12]													
Crop Planting	Maize (months 1-4), Water Melon (months 7-8), Honey Harv. (months 7-10)													
Farming Labour Demand	High (months 1-4, 8-10), Low (months 5-7, 11-12)													
School Term	[School term pattern: Active in months 1-4, 8-10; Break in months 5-7, 11-12]													
Activities of Verification Projects	[Project activities: 1. Improved Jiko (months 2-4), 2. Small Scale Industry (months 2-4), 3. Small Scale Industry (months 2-4)]													
1. Improved Jiko	[Sub-activities: 1.1 Demonstration of improved Jiko (month 2), 1.2 Identify and forming women group (month 2), 1.3 Study tour to preceding areas (month 3), 1.4 Collection of money for Jiko (month 3), 1.5 Purchasing the Jiko inner liner (month 4), 1.6 Construction of Jiko by Merry-go-around (month 4), 1.7 Promotion of firewood conservation practices (month 4), 1.8 Improved Jiko in use (months 2-4)]													
2. Small Scale Industry (Fish processing)	[Sub-activities: 2.1 Fry fish, (individual basis) (months 2-4)]													
3. Small Scale Industry (Bee Keeping)	[Sub-activities: 3.1 Mobilizing bee keeping groups (month 2), 3.2 Study tour to preceding areas just nearby (month 2), 3.3 Collection of money for bee keeping (month 3), 3.4 Material purchase (month 3), 3.5 Training and Setting up Hives (month 4), 3.6 In operation (months 2-4), 3.7 Harvesting (months 2-4), 3.8 Semi-refinery & Bottling (months 2-4), 3.9 Marketing (months 2-4)]													

**Table I.2-4** Communal Resource Management (Participatory Irrigation Management + Modernized Livestock Feeding at Sandai Irrigation Scheme)

Year Month	2000						2001																
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9		
Monthly Rainfall																							
Crop Planting																							
Farming Labour Demand																							
High																							
Low																							
School Term																							
Activities of Verification Projects																							
I. Participatory Irrigation Management																							
1.1 Assessment of present irrigation conditions																							
1.2 Review/preparation of group by-law																							
1.3 Preparation of rehabilitation plan																							
1.4 Election of management committee																							
1.5 Compilation of rehabilitation budget																							
1.6 Implementation of rehabilitation works																							
1.7 Routine operation and maintenance																							
1.8 Review of irrigation performance and budget approval																							
1.9 Study tours to preceding areas																							
2. On-farm Water Saved Irrigation (9 acres)																							
2.1 Identification of sample blocks and farmers																							
2.2 Preparation of on-farm water saved irrigation plan																							
2.3 Planning go cropping schedule																							
2.4 Planning of improved farming practices																							
2.5 Strengthening of water user's association																							
2.6 Implementation of land leveling																							
2.7 Operation of on-farm saved irrigation																							
3. Modernized Livestock Feeding																							
3.1 Identification of typical livestock farmers																							
3.2 Planning of modernized livestock feeding																							
3.3 Promotion of new breeding and production system																							
3.4 Promotion of new feeding system																							
3.5 Improvement of animal health system																							

Table I.2-5 Rehabilitation of Pan in Rugus

	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Monthly Rainfall															
Crop Planting			Maize												
Farming Labour Demand															
High															
Low															
School Term															
Activities of Verification Projects															
1. Rehabilitation of Pan															
1.1 Review of general conditions of pan															
1.2 Election of management committee															
1.3 Review/preparation of pan by-law															
1.4 Preparation of rehabilitation plan and budget															
1.5 Registration with Dept. of Social Services															
1.6 Implementation of rehabilitation															
1.7 Routine operation and maintenance															
1.8 Study tours to preceding areas															

Table I.2-6 Food Security in Arabal

	2000												2001				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
Monthly Rainfall																	
Crop Planting			Maize														
Farming Labour Demand																	
High																	
Low																	
School Term																	
Activities of Verification Projects																	
1. Modernized Livestock Feeding																	
1.1 Identification of typical livestock farmers																	
1.2 Planning of modernized livestock feeding																	
1.3 Promotion of new breeding and production system																	
1.4 Promotion of new feeding system																	
1.5 Improvement of animal health system																	
1.6 Study tours to preceding areas																	
2. Implementation of Rain Water Harvest																	
2.1 Identification of run-off catchment and rain water harvest areas																	
2.2 Preparation of rain water harvest plan																	
2.3 Planning of cropping schedule																	
2.4 Planning of improved farming practices																	
2.5 Implementation of run-off catchment facilities																	
2.6 Implementation of on-farm water saved irrigation																	
2.7 Crop production with rain water harvest																	
2.8 Study tours to preceding areas																	

Table I.2-7 Learning from Best Practices

Year	2000												2001		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Monthly Rainfall															
Crop Planting			Maize					Water Melon							
Farming Labour Demand							Hony Harv.			Hony Harv.					
High															
Low															
School Term															
Activities of Verification Projects															
1. Learning from Best Practices															
Semi-Arid Rural Development Program (SARDEP)															
1.1 Project in the Keiyo & Marakwet Division															
1.2 Samburu District Integrated Development Project															
1.3 Kiisui Forest Development Project															

Table I.3-1 Cost Estimation for Verification Projects

(Summary 1)

Items	Cost Allocation			Total
	JICA	GOK	Community	
Total Cost (Ksh portion)	Ksh 17,755,990	Ksh 921,000	Ksh 1,663,965	Ksh 20,340,955
Total Cost (Yen portion)	¥4,098,000	¥0	¥0	¥4,098,000
Ground Total (Ksh)	Ksh 20,672,000	Ksh 921,000	Ksh 1,664,000	Ksh 23,257,000
Ground Total (Yen)	¥29,053,000	¥1,294,000	¥2,339,000	¥32,686,000
1 Improved Stove + Small Scale Industry	Ksh 3,853,900	Ksh 75,000	Ksh 232,500	Ksh 4,161,400
	Ksh 3,854,000	Ksh 75,000	Ksh 233,000	Ksh 4,162,000
2 Health Center	Ksh 1,227,765	Ksh 240,000	Ksh 0	Ksh 1,467,765
	¥3,799,700	¥0	¥0	Ksh 3,799,700
	Ksh 3,931,000	Ksh 240,000	Ksh 0	Ksh 4,171,000
3 Strengthening of Marigat Youth Polytechnic	Ksh 2,871,534	Ksh 260,000	Ksh 18,625	Ksh 3,150,159
	¥99,100	¥0	¥0	Ksh 99,100
	Ksh 2,942,000	Ksh 260,000	Ksh 19,000	Ksh 3,221,000
4 Communal Resource Management	Ksh 4,797,928	Ksh 154,000	Ksh 1,220,450	Ksh 6,172,378
	¥99,600	¥0	¥0	Ksh 99,600
	Ksh 4,869,000	Ksh 154,000	Ksh 1,220,000	Ksh 6,243,000
5 Rehabilitation of Pan	Ksh 832,714	Ksh 64,000	Ksh 43,480	Ksh 940,194
	Ksh 833,000	Ksh 64,000	Ksh 43,000	Ksh 940,000
6 Food Security	Ksh 1,315,796	Ksh 128,000	Ksh 148,910	Ksh 1,592,706
	¥99,600	¥0	¥0	Ksh 99,600
	Ksh 1,387,000	Ksh 128,000	Ksh 149,000	Ksh 1,664,000
7 Field Visit to Observe On-going Projects	Ksh 2,856,354	Ksh 0	Ksh 0	Ksh 2,856,354
	Ksh 2,856,000	Ksh 0	Ksh 0	Ksh 2,856,000

Note: US\$ = 74 Ksh  
 = 104 Yen  
 Ksh = 1.4054 Yen

Table I.3-2 Cost Estimation for Verification Projects

(Summary 2)

Items		Ksh 20,340,955		Ksh 4,098,000				Total	Remarks
Q'ty	Unit	JICA	GOK	Community					
1	Improved Stove + Small Scale Industry			Ksh 3,853,900	Ksh 75,000	Ksh 232,500	Ksh 4,161,400		
1)	Introduction of Improved Jiko	1	Ls	Ksh 867,000	Ksh 0	Ksh 6,000	Ksh 873,000		
2)	Fish Processing (fish frying)	1	Ls	Ksh 0	Ksh 0	Ksh 7,000	Ksh 7,000		
3)	Honey Production and Marketing	1	Ls	Ksh 2,721,400	Ksh 0	Ksh 219,500	Ksh 2,940,900		
4)	Others	1	Ls	Ksh 265,500	Ksh 75,000	Ksh 0	Ksh 340,500		
2	Health center			Ksh 1,227,765	Ksh 240,000	Ksh 0	Ksh 1,467,765		
				¥3,799,700	¥0	¥0	¥3,799,700		
1)	Surveillance of Diseases (Ksh)	1	Ls	Ksh 453,000	Ksh 0	Ksh 0	Ksh 453,000		
	Surveillance of Diseases (Yen)	1	Ls	¥3,799,700	¥0	¥0	¥3,799,700		
2)	Support System	1	Ls	Ksh 30,000	Ksh 0	Ksh 0	Ksh 30,000		
3)	Information activity	1	Ls	Ksh 200,000	Ksh 0	Ksh 0	Ksh 200,000		
4)	Back up for Project and others	1	Ls	Ksh 544,765	Ksh 240,000	Ksh 0	Ksh 784,765		
3	Strengthening of Marigat Youth Polytechnic			Ksh 2,871,534	Ksh 260,000	Ksh 18,625	Ksh 3,150,159		
				¥99,100	¥0	¥0	¥99,100		
1)	Enhancement for Woodworker class	1	Ls	Ksh 2,234,800	Ksh 140,000	Ksh 0	Ksh 2,374,800		
2)	Introduction of small equipment	1	Ls	¥99,100	¥0	¥0	¥99,100		
3)	Construction work by trained people	1	Ls	Ksh 305,375	Ksh 0	Ksh 18,625	Ksh 324,000		
4)	Others	1	Ls	Ksh 331,359	Ksh 120,000	Ksh 0	Ksh 451,359		
4	Communal resource management			Ksh 4,797,928	Ksh 154,000	Ksh 1,220,450	Ksh 6,172,378		
				¥99,600	¥0	¥0	¥99,600		
1)	Participatory Irrigation Management	1	Ls	Ksh 3,758,600	Ksh 0	Ksh 1,090,200	Ksh 4,848,800	Community: Labor Work	
2)	Water saved Irrigated Agriculture	1	Ls	Ksh 69,300	Ksh 0	Ksh 61,290	Ksh 130,590		
3)	Modernized livestock feeding (Ksh)	1	Ls	Ksh 285,240	Ksh 0	Ksh 68,960	Ksh 354,200		
	Modernized livestock feeding (Yen)	1	Ls	¥99,600	¥0	¥0	¥99,600		
4)	Others	1	Ls	Ksh 684,788	Ksh 154,000	Ksh 0	Ksh 838,788		
5	Rehabilitation of Pan			Ksh 832,714	Ksh 64,000	Ksh 43,480	Ksh 940,194		
1)	Rehabilitation of Pan	1	Ls	Ksh 765,320	Ksh 0	Ksh 43,480	Ksh 808,800		
2)	Others	1	Ls	Ksh 67,394	Ksh 64,000	Ksh 0	Ksh 131,394		
6	Food Security			Ksh 1,315,796	Ksh 128,000	Ksh 148,910	Ksh 1,592,706		
				¥99,600	¥0	¥0	¥99,600		
1)	Animal breeding (Ksh)	1	Ls	Ksh 285,240	Ksh 0	Ksh 68,960	Ksh 354,200		
	Animal breeding (Yen)	1	Ls	¥99,600	¥0	¥0	¥99,600		
2)	Stabilization of Rainfed Agriculture	1	Ls	Ksh 897,550	Ksh 0	Ksh 79,950	Ksh 977,500		
3)	Others	1	Ls	Ksh 133,006	Ksh 128,000	Ksh 0	Ksh 261,006		
7	Field Visit to Observe Ongoing Project			Ksh 2,856,354	Ksh 0	Ksh 0	Ksh 2,856,354		
1)	Field visit to SARDEP	1	Ls	Ksh 381,515	Ksh 0	Ksh 0	Ksh 381,515		
2)	Field visit to Samburu	1	Ls	Ksh 1,180,750	Ksh 0	Ksh 0	Ksh 1,180,750		
3)	Field visit to Kitui	1	Ls	Ksh 1,034,420	Ksh 0	Ksh 0	Ksh 1,034,420		
4)	Other Train and Study	1	Ls	Ksh 259,669	Ksh 0	Ksh 0	Ksh 259,669		



Table I.3-3 Cost Estimation for Verification Projects

Project: Improved Stove + Small Scale Industry at Kampi ya Samaki

Ksh 4,161,400

Items	Q'ty	Unit	Unit Price	Cost Allocation			Remarks
				JICA	GOK	Community	
1-1 Introduction of Improved Jiko							
1) Material (inner ring of the Jiko)	20	Nos	Ksh 150			Ksh 3,000	
2) Other materials	20	Sets	Ksh 150			Ksh 3,000	
3) 4WD for organizing the Community	16	days	Ksh 17,000	Ksh 272,000			(5groups x 3days + 1day)
4) 4WD for study tour to preceding area	11	days	Ksh 17,000	Ksh 187,000			(20pers./4pers. X 2times + 1day)
5) 4WD for purchasing the material	7	days	Ksh 17,000	Ksh 119,000			(20pers./4pers. +2day)
6) 4WD for dissemination of effective use	17	day	Ksh 17,000	Ksh 289,000			(3day x 5gruop +2day)
Sub-total				Ksh 867,000	Ksh 0	Ksh 6,000	
1-2 Fish Processing (fish frying)							
1) Fry pan for fish frying	5	Nos	Ksh 1,400				
Sub-total				Ksh 0	Ksh 0	Ksh 7,000	
1-3 Honey Production and Marketing							
1) Bee Hive	20	Nos	Ksh 900			Ksh 18,000	
2) Other Material for Hive(smoker, gloves, etc)	20	Nos	Ksh 1,000			Ksh 20,000	
3) Refining material (straining cloth, bag, etc)	20	Sets	Ksh 450			Ksh 9,000	
4) Honey jars	500	Nos	Ksh 15			Ksh 7,500	
5) Label for Honey jar	500	Nos	Ksh 15			Ksh 7,500	
6) Multi-purpose building	70	m2	Ksh 22,500	Ksh 1,417,500			Masonry, Community: 10%
7) 4WD for mobilizing the women group	17	days	Ksh 17,000	Ksh 289,000			(5group x 3day + 2day)
8) 4WD for purchasing equipment	17	days	Ksh 17,000	Ksh 289,000			(5group x 3day+2day)
9) 4WD for study tour for preceding area	22	days	Ksh 17,000	Ksh 374,000			(5group x 4day +2day)
10) Trainer's transportation from NBKS(*1)	17	days	Ksh 17,000	Ksh 289,000			(5days/week X 3week+2days)
11) Perdiem and lodging for trainer	17	days	Ksh 3,500	Ksh 59,500			
12) Training book published by NBKS(*1)	2	Nos	Ksh 1,700	Ksh 3,400			
Sub-total				Ksh 2,721,400	Ksh 0	Ksh 219,500	
1-4 Others							
1) Miscellaneous	1	Ls	5%	Ksh 85,645			5% of above all items' cost (Ksh) excluding 4DW rental costs
2) Contingency	1	Ls	10%	Ksh 179,855			10% of above all items' cost (Ksh) excluding 4DW rental costs
3) Perdiem for counterpart	75	days	Ksh 1,000		Ksh 75,000		1 month(Jiko), 1.5 month(Honey)
Sub-total				Ksh 265,500	Ksh 75,000	Ksh 0	
Grand total				Ksh 3,853,900	Ksh 75,000	Ksh 232,500	

(\*1); NBKS: National Bee Keeping Station

Table I.3-4 Cost Estimation for Verification Projects

Project: Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases

Ksh 1,467,765

Ksh 3,799,700

Items	Q'ty	Unit	Unit Price	Cost Allocation			Remarks
				JICA	GOK	Community	
2-1 Surveillance of Diseases							
1) Binocular Microscope	2	Nos	¥355,000	¥710,000			220V, 20V30W Lamp
2) Binocular Dissecting Microscope	1	Nos	¥205,000	¥205,000			
3) Dissecting Kit	2	Nos	¥70,000	¥140,000			
4) Identification Kits	2	Ls	¥140,000	¥280,000			
5) Autoclave	1	Nos	¥850,000	¥850,000			Medium Size
6) Test tubes for Centrifuge	100	Nos	Ksh 980	Ksh 98,000			
7) Test tubes for Blood Grouping	100	Nos	Ksh 980	Ksh 98,000			
8) Manual Cell Counter	2	Nos	¥5,000	¥10,000			
9) Oil immersion for Microscope	5	Lit	¥33,000	¥165,000			
10) Glycerin	10	Lit	¥4,000	Ksh 40,000			
11) Giemsa Powder for staining	500	gram	¥600	¥300,000			
12) Formaldehyde	10	Lit	¥1,900	¥19,000			
13) Slide glass for Microscope	20	Doz.	¥10,500	¥210,000			
14) Cover slip for Microscope	30	Doz.	¥6,750	¥202,500			
15) Beaker 500ml	10	Nos	¥900	¥9,000			
16) Beaker 100ml	10	Nos	¥420	¥4,200			
17) Measuring Cylinder 1,000ml (gls)	10	Nos	¥15,000	¥150,000			
18) Measuring Cylinder 500ml (gls)	10	Nos	¥7,000	¥70,000			
19) Measuring Cylinder 100ml(pls)	10	Nos	¥6,000	¥60,000			
20) Measuring Cylinder 10ml(pls)	10	Nos	¥1,700	¥17,000			
21) Holo pipette (large)	5	Nos	¥5,000	¥25,000			
22) Holo pipette (medium)	5	Nos	¥4,000	¥20,000			
23) Holo pipette (small)	5	Nos	¥2,500	¥12,500			
24) Mess pipette	5	Nos	¥1,000	¥5,000			
25) Rubber ball for pipette	5	Nos	¥2,100	¥10,500			
26) Glass pipe	10	m	¥2,500	¥25,000			
27) Polyethylene Pots	1,000	Nos	¥120	¥120,000			
28) Universal Bottle	300	Nos	¥300	¥90,000			
30) Rubber glove	100	Nos	¥500	¥50,000			
31) Electric refrigerator	1	Nos	Ksh 157,000	Ksh 157,000			medium size
32) Rehabilitation for Drafting system	1	Nos	Ksh 100,000	Ksh 100,000			
Sub-total (Yen)				¥3,799,700	¥0		
Sub-total (Ksh)				Ksh 453,000	Ksh 0		
2-2 Support System							
1) Handy disinfection sprayer (18L)	2	Nos	Ksh 15,000	Ksh 30,000			
Sub-total				Ksh 30,000	Ksh 0		
2-3 Information activity							
1) Information bills	1	Ls	Ksh 200,000	Ksh 200,000			
Sub-total				Ksh 200,000	Ksh 0		
2-4 Back up for Project and others							
1) Motor bike (175cc)	1	Nos	Ksh 380,000	Ksh 380,000			
2) Fuel for motor bike	1	Ls	Ksh 120,000	Ksh 120,000			1000Ksh/day x 120days
3) Miscellaneous	1	Ls	5K	Ksh 53,150			5% of above all items' cost (Ksh)
4) Contingency	1	Ls	10K	Ksh 111,615			10% of above all items' cost (Ksh)
5) Perdiem for counterpart	120	days	Ksh 1,000	Ksh 120,000			5 x 12month x 2staffs
Sub-total				Ksh 544,765	Ksh 240,000		
Ground total				Ksh 1,227,765	Ksh 240,000		
Ground total				¥3,799,700	¥0		

Table I.3-5 Cost Estimation for Verification Projects

Project: Strengthening Marigat Youth Polytechnic

		Ksh 3,150,159		Ksh 100		Ksh 100			
Items				Cost Allocation				Remarks	
Enhancement for Woodworker class	Q'ty	Unit	Unit Price	JICA	GOK	Community			
3-1	Enhancement for Woodworker class								
1)	Saws	5	Sets	Ksh 7,200	Ksh 36,000		4 types		
2)	Chisels	5	Sets	Ksh 53,000	Ksh 265,000		12 types		
3)	Planes	5	Sets	Ksh 44,500	Ksh 222,500		7 types		
4)	Gimlets, augers	5	Sets	Ksh 15,600	Ksh 78,000		6 types		
5)	Rulers	5	Sets	Ksh 7,500	Ksh 37,500		5 types		
6)	Hammers	5	Sets	Ksh 23,000	Ksh 115,000		9 types (Steel, wood)		
7)	Rasps and files	5	Sets	Ksh 14,000	Ksh 70,000		5 types		
8)	Vises and shackle vices	3	Sets	Ksh 110,000	Ksh 330,000		7 types		
9)	Small equipment	1	Ls	20%	Ksh 230,800		20% of above all items' cost		
10)	Electrical equipment	2	Sets	Ksh 100,000	Ksh 200,000		Dram cord, drill etc		
11)	4WD for purchasing the material	6	days	Ksh 17,000	Ksh 102,000		(2day x2time +2day)		
12)	4WD for study tour	16	days	Ksh 17,000	Ksh 272,000		(3dayx12pers/5pers x 2time+2d)		
13)	Trainer's transportation	8	days	Ksh 17,000	Ksh 136,000		2days x 4time		
14)	Perdiem and lodging for trainer	80	days	Ksh 3,500	Ksh 140,000	Ksh 140,000	20days/M x 4months		
	Sub-total				Ksh 2,234,800	Ksh 140,000	Ksh 0		
3-2	Introduction of small equipment								
1)	Sickles and grindstones	2	Sets	¥2,300	¥4,600		From Japan		
2)	Portable grass chopper	2	Nos	¥9,500	¥19,000		From Japan		
3)	Hoes	2	Sets	¥25,000	¥50,000		From Japan, 3 types		
4)	Wooden rack for carrying	3	Nos	¥8,500	¥25,500		From Japan		
	Sub-total				¥99,100	¥0	¥0		
3-3	Construction work by trained people								
1)	shovels	60	Nos	Ksh 500	Ksh 22,500		Community: 25%		
2)	Hammers (woody)	80	Nos	Ksh 400	Ksh 24,000		Community: 25%		
3)	Sieves	10	Nos	Ksh 1,250	Ksh 9,375		Community: 25%		
4)	wheelbarrow	25	Nos	Ksh 2,500	Ksh 62,500		shovel 60/6=10		
5)	4WD for purchasing equipment	11	Nos	Ksh 17,000	Ksh 187,000		(3day x 3time +2day)		
	Sub-total				Ksh 305,375	Ksh 0	Ksh 18,625		
3-3	Others								
1)	Miscellaneous	1	Ls	5%	Ksh 106,890		5% of above all items' cost (Ksh) excluding 4DW rental costs		
2)	Contingency	1	Ls	10%	Ksh 224,469		10% of above all items' cost (Ksh) excluding 4DW rental		
3)	Perdiem for counterpart	120	days	Ksh 1,000		Ksh 120,000			
	Sub-total				Ksh 331,359	Ksh 120,000	Ksh 0		
	Ground Total (Ksh)				Ksh 2,871,534	Ksh 260,000	Ksh 18,625		
	Ground Total (Yen)				¥99,100	¥0	¥0		

Table I.3-6 Cost Estimation for Verification Projects

Project: Communal Resource Management (Participatory Irrigation Management + Modernized Livestock Feeding) at Sandai Irrigation Scheme

		¥99,600									
		Ksh 5,968,378									
4-1	Participatory Irrigation Management	Items	Q'ty	Unit	Unit Price	Cost Allocation			Remarks		
						JICA	GOK	Community			
	1)	Field Survey	1	Ls	Ksh 520,800	Ksh 520,800					
	2)	Division box with gate	1	Ls	Ksh 500,000	Ksh 350,000					
	3)	Concrete lining at Main Canal	300	m	Ksh 9,800	Ksh 2,058,000			Ksh 150,000	Community: 30%	
	4)	Other concrete structures	1	Ls	Ksh 144,000	Ksh 100,800			Ksh 882,000	Community: 30%	
	5)	Equipment for concrete mixing	1	Ls	Ksh 50,000	Ksh 35,000			Ksh 43,200	Community: 30%	
	6)	Other equipment	1	Ls	Ksh 20,000	Ksh 14,000			Ksh 15,000	Community: 30%	
	7)	4WD for purchasing equipment	22	days	Ksh 17,000	Ksh 261,800				(4day x 5time +2day)	
	8)	4WD for study tour to preceding area	18	days	Ksh 17,000	Ksh 214,200				(4day x 20pers./5pers + 2day)	
		Sub-total				Ksh 3,554,600	0	Ksh 1,090,200			
4-2		Water saved Irrigated Agriculture									
	1)	Land Leveling	9	acres	Ksh 8,500	Ksh 53,550			Ksh 22,950	Community: 30%	
	2)	Ripping	9	acres	Ksh 1,000	Ksh 6,300			Ksh 2,700	Community: 30%	
	3)	Harrowing	9	acres	Ksh 1,500	Ksh 9,450			Ksh 4,050	Community: 30%	
	4)	Seeds	9	acres	Ksh 1,000				Ksh 9,000		
	5)	Fertilizer	9	acres	Ksh 2,160				Ksh 19,440		
	6)	Pesticide	9	acres	Ksh 350				Ksh 3,150		
		Sub-total				Ksh 69,300	0	Ksh 61,290			
4-3		Livestock improvement									
	1)	Buck	5	Nos	Ksh 5,000	Ksh 17,500			Ksh 7,500	Community: 30%	
	2)	Castrator	2	Nos	Ksh 8,000	Ksh 11,200			Ksh 4,800	Community: 30%	
	3)	Sickles and grindstones	2	Nos	¥2,300	¥4,600				From Japan	
	4)	Portable grass chopper	10	Nos	¥9,500	¥95,000				From Japan	
	5)	Ear notcher	5	Nos	Ksh 3,000	Ksh 10,500			Ksh 4,500	Community: 30%	
	6)	Handy disinfection sprayer (18L)	2	Nos	Ksh 15,000	Ksh 21,000			Ksh 9,000	Community: 30%	
	7)	Engine motor pump	1	Nos	Ksh 47,200	Ksh 33,040			Ksh 14,160	Community: 30%	
	8)	Net for Tsetse fly	10	Nos	Ksh 8,000	Ksh 56,000			Ksh 24,000	Community: 30%	
	9)	4WD for purchasing the equipment	8	days	Ksh 17,000	Ksh 136,000				(3day x 2time +2day)	
	10)	Rehabilitation of Dip	1	Ls	Ksh 5,000				Ksh 5,000		
		Sub-total (Ksh)				Ksh 285,240	Ksh 0	Ksh 68,960			
		Sub-total (Yen)				¥99,600					
4-4		Others									
	1)	Miscellaneous	1	Ls	5%	Ksh 220,900				5% of above all items' cost (Ksh) excluding 4DW rental costs	
	2)	Contingency	1	Ls	10%	Ksh 463,889				10% of above all items' cost (Ksh) excluding 4DW rental costs	
	3)	Perdiem for counterpart	154	days	1,000		Ksh 154,000			21 x 2M+4 x 13M+4 x 15M	
		Sub-total				Ksh 684,788	Ksh 154,000	Ksh 0			
		Grand total (Ksh)				Ksh 4,593,928	Ksh 154,000	Ksh 1,220,450			
		Grand total (Yen)				¥99,600					

Table I.3-7 Cost Estimation for Verification Projects

Project: Rehabilitation of Pan in Rugus									
Ksh 940,194									
Items	Q'ty	Unit	Unit Price	Cost Allocation			Remarks		
				JICA	GOK	Community			
5-1 Rehabilitation of Pan									
1) Shovel and hoe	20	Set	Ksh 2,000	Ksh 36,000		Ksh 4,000	Community: 10%		
2) Wheelbarrow	10	Nos	Ksh 2,500	Ksh 22,500		Ksh 2,500	Community: 10%		
3) Post for fence	1,000	Nos	Ksh 40	Ksh 36,000		Ksh 4,000	Community: 10%		
4) Steel wire and barbed wire	16	reels	Ksh 4,500	Ksh 64,800		Ksh 7,200	Community: 10%		
5) Equipment (cutter, hammer etc)	5	set	Ksh 1,000	Ksh 4,500		Ksh 500	Community: 10%		
6) Bucket	4	Nos	Ksh 450	Ksh 1,620		Ksh 180	Community: 10%		
7) rope	1	Ls	Ksh 1,000	Ksh 900		Ksh 100	Community: 10%		
8) Nursery tree for fence	1	Ls	Ksh 250,000	Ksh 225,000		Ksh 25,000	Community: 10%		
9) 4WD for purchasing equipment	11	days	Ksh 17,000	Ksh 187,000			(3day x 3time +2day)		
10) 4WD for study tour to preceding area	11	days	Ksh 17,000	Ksh 187,000			(3day x 3time +2day)		
Sub-total				Ksh 765,320		Ksh 0	Ksh 43,480		
5-2 Others									
1) Miscellaneous	1	Ls	5%	Ksh 21,740				5% of above all items' cost.(Ksh) excluding 4WD rental costs	
2) Contingency	1	Ls	10%	Ksh 45,654				10% of above all items' cost.(Ksh) excluding 4WD rental costs	
3) Perdiem for counterpart	64	days	1,000		Ksh 64,000			12days + 4days x 13M	
Sub-total				Ksh 67,394		Ksh 64,000	Ksh 0		
Ground total				Ksh 832,714		Ksh 64,000	Ksh 43,480		

Table I.3.8 Cost Estimation for Verification Projects

Project: Food Security in Arabal		Ksh 1,592,706							¥99,600	
Items	Q'ty	Unit	Unit Price	JICA	GOK	Community	Remarks			
6-1 Animal improvement										
1) Bucks	5	Nos	Ksh 5,000	Ksh 17,500		Ksh 7,500	Community: 30%			
2) Castrator	2	Nos	Ksh 8,000	Ksh 11,200		Ksh 4,800	Community: 30%			
3) Sickles and Grindstone	2	sets	¥2,300	¥4,600			From Japan			
4) Portable grass chopper	10	Nos	¥9,500	¥95,000			From Japan			
5) Ear notcher	5	Nos	Ksh 3,000	Ksh 10,500		Ksh 4,500	Community: 30%			
6) Handy disinfection sprayer (18L)	2	Nos	Ksh 15,000	Ksh 21,000		Ksh 9,000	Community: 30%			
7) Engine motor pump	1	Nos	Ksh 47,200	Ksh 33,040		Ksh 14,160	Community: 30%			
8) Net for Tsetse fly	10	Nos	Ksh 8,000	Ksh 56,000		Ksh 24,000	Community: 30%			
9) 4WD for purchasing the equipment	8	days	Ksh 17,000	Ksh 136,000			(3day x 2time + 2day)			
10) Rehabilitation for Dip	1	Ls	Ksh 5,000		Ksh 0	Ksh 5,000	Community: 100%			
Sub-total (Ksh)				Ksh 285,240	Ksh 0	Ksh 68,960				
Sub-total (Yen)				¥99,600	¥0	¥0				
6-2 Stabilization of Rainfed Agriculture										
1) Field Survey	1	Ls	282,000	Ksh 282,000						
2) Terracing	35	hr	Ksh 3,500	Ksh 110,250		Ksh 12,250	7hr x 5days, Community: 10%			
3) Silt trap by stone	2100	m	Ksh 65	Ksh 122,850		Ksh 13,650	Community: 10%			
4) Silt trap by tree	2100	m	Ksh 55	Ksh 103,950		Ksh 11,550	Community: 10%			
5) Seeds	10	acre	Ksh 1,000			Ksh 10,000				
6) Fertilizer	10	acre	Ksh 800			Ksh 8,000				
7) Fuel for Machine	1	Ls	Ksh 45,000	Ksh 40,500		Ksh 4,500	Community: 10%			
8) 4WD for study tour to preceding area	14	day	Ksh 17,000	Ksh 238,000			(4day x 15pers/5pers + 2day)			
9) Small equipment for O/M	10	set	Ksh 2,000			Ksh 20,000				
Sub-total				Ksh 897,550	Ksh 0	Ksh 79,950				
6-3 Others										
1) Miscellaneous	1	Ls	5%	Ksh 42,905			5% of above all items' cost(Ksh)			
2) Contingency	1	Ls	10%	Ksh 90,101			10% of above all items' cost(ksh)			
3) Perdiem for counterpart	128	days	1,000		Ksh 128,000		(12+4 x 13M) x 2staffs			
Sub-total				Ksh 133,006	Ksh 128,000	Ksh 0				
Ground total (Ksh)				Ksh 1,315,796	Ksh 128,000	Ksh 148,910				
Ground total (Yen)				¥99,600	¥0	¥0				

Table I.3-9 Cost Estimation for Verification Projects

Project: Field Visits to observe On-going Projects									
Ksh 2,856,000									
Items	Q'ty	Unit	Unit Price	Cost Allocation			Remarks		
				JICA	GOK	Community			
7-1 Field visit to SARDEP									
1) Transportation (micro bus)	9	days	Ksh 28,500	Ksh 256,500			4cars X 1day, 1cars X 5days		
2) Lodging	20	Nos	Ksh 2,000	Ksh 40,000			5person X 4days		
3) meals	60	sets	Ksh 500	Ksh 30,000			35person+5person X 5days		
4) Perdiem for resource person	10	days	Ksh 1,000	Ksh 10,000			2person X 5days		
5) Preparatory activities	1	Ls	10%	Ksh 33,650			10% of above all items' cost		
6) Contingency	1	Ls	10%	Ksh 11,365			20% of above all items' cost		
<b>Sub-total (Ksh)</b>				<b>Ksh 381,515</b>		<b>Ksh 0</b>	<b>(Ksh) excluding transportation</b>		
7-2 Field visit to Samburu									
1) Transportation (micro bus)	23	days	Ksh 28,500	Ksh 655,500			4cars X 4days, 1cars X 7days		
2) Lodging	135	Nos	Ksh 2,000	Ksh 270,000			35pers. X 3dy, 5pers. X 6dy		
3) meals	175	sets	Ksh 500	Ksh 87,500			35pers X 4dy, 5pers. X 7dy		
4) Perdiem for resource person	17	days	Ksh 1,000	Ksh 17,000			2pers X 5dy, 1pers. X 7dy		
5) Preparatory activities	1	Ls	10%	Ksh 103,000			10% of above all items' cost		
6) Contingency	1	Ls	10%	Ksh 47,750			20% of above all items' cost		
<b>Sub-total (Ksh)</b>				<b>Ksh 1,180,750</b>		<b>Ksh 0</b>	<b>(Ksh) excluding transportation</b>		
7-3 Field visit to Kitui									
1) Transportation (micro bus)	20	days	Ksh 28,500	Ksh 570,000			5cars X 4days		
2) Lodging	120	Nos	Ksh 2,000	Ksh 240,000			40person X 3days		
3) meals	160	sets	Ksh 500	Ksh 80,000			40person X 4days		
4) Perdiem for resource person	12	days	Ksh 1,000	Ksh 12,000			3person X 4days		
5) Preparatory activities	1	Ls	10%	Ksh 90,200			10% of above all items' cost		
6) Contingency	1	Ls	10%	Ksh 42,220			20% of above all items' cost		
<b>Sub-total</b>				<b>Ksh 1,034,420</b>		<b>Ksh 0</b>	<b>(Ksh) excluding transportation</b>		
7-4 Other Train and Study									
1) Trains and Studies	1	Ls	10%	Ksh 259,669			Ksh 0		
<b>Sub-total</b>				<b>Ksh 259,669</b>			<b>Ksh 0</b>		
<b>Ground total (Ksh)</b>				<b>Ksh 2,856,000</b>		<b>Ksh 0</b>			

## **I. Project Evaluation**

### **I.1 Project Impacts of the Verification Projects**

The impacts of each verification project are assumed as follows;

(1) Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases

- People will get knowledge on the mechanism of the disease infection in the area
- People can get informed before the outbreak of diseases
- People can practice measures to prevent the infection of diseases
- After all the disease for human and animals will decrease

(2) Strengthening of Marigat Youth Polytechnic

- Students get skill and job opportunities
- Number of students at the Polytechnic will increase

(3) Improved Stove + Small Scale Industry (Bee-keeping and Fish Processing)

- Amount of firewood will be decreased
- Labor for fetching firewood will be eased
- Income of the people will increase by the small-scale industry

(4) Communal Resource Management (PIM + Livestock Improvement)

- Equitable water distribution will be attained by the effective water management
- Cropping intensity will be increased by the efficient water use
- Crop yield will increase by the efficient water use, quality seeds and so on
- Milk and meat production will increase by the livestock improvement
- Market prices of animals will be raised by the livestock improvement

(5) Rehabilitation of Pan

- Labor for fetching water will be eased
- Water borne disease will decrease
- Crop yield in the rain-fed farmland will increase

(6) Food Security (Livestock Improvement + Rain Water Harvesting)

- Milk and meat production will increase by the livestock improvement
- Market prices of animals will be raised by the livestock improvement
- Crop yield in the rain-fed farmland will increase

(7) Learning from Best Practices

- Government officers and community members will be enlightened for Participatory Rural Development



## I.2 Financial and Economic Analyses

Financial and Economic Analyses were conducted to the verification projects whose effects are tangible, namely Improved Jiko + Small-scale Industry in Salabani, Communal Resource Management in Sandai, and Food Security in Arabal. Firstly expected income increase by a household was estimated and the possibility of cost sharing was examined. Secondly Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) were calculated for the analyses. These FIRR and EIRR of the projects will be compared with the base interest rate and opportunity cost in Kenya. The base interest rate is applied with 13.4 percent, the annual average 90-day treasury rates from September 1998 to August 1999. The opportunity cost is considered as eight percent. Although these rates are regarded as the criteria of feasibility of the projects in terms of economy, the appraisal of the projects should include the viewpoints of poverty alleviation, gender aspect, social conflict management, and environmental conservation.

Standard Conversion Factor (SCF) of 0.923 was adopted to calculate economic prices for domestic goods. For the import/export goods such as maize, fertilizer, the economic prices were calculated according to the projected prices by the World Bank. Shadow exchange rate of unskilled labor was estimated at 0.5. To calculate project costs on economic price, the SCF and shadow exchange rate were applied.

### U.2.1 Household Budget

In the three locations, the income increase is expected by the realization of the projects. The expected income increase by a household and the comparison with the cost shared by a household are summarized as follows.

#### A Household Income Analysis

Location	Input	Income w/o project (Ksh)	Income w/ project (Ksh)	Difference (Ksh)	Cost shared (Ksh/year) (*)
Salabani	1Jiko, 1KTBH	4,597	5,831	1,234	784
Sandai	1 acre farm	9,425	14,201	4,776	2,177
	10.5 female goatss	17,955	36,855	18,900	7,241
Arabal	1 acre farm	-134	4,914	5,048	7,995
	16 female goats	27,360	56,160	28,800	11,034

Note: (\*) Cost shared is the one in the initial year.

Among them, the component of rainfed agriculture at Food Security project in Arabal shows high burden for people. A household will take more than a year to recover the cost contributed from their benefit. There might be, however, interest among people to secure the source of food. So in total, the projects in Arabal, the remote area from the town, would still be proposed. Or the

cost shared by the other stakeholder can be raised since the project is also considered to be effective for environmental conservation, rather more public interest. Also in the course of the verification project, the distribution of cost sharing should be reviewed.

## 1.2.2 Cost-benefit analysis

### 1) Improved Jiko + Small-scale Industry

#### a) Benefit

The benefit of the project is increase of net profit by the income generating activities. The reduction of labor for fetching firewood will become tangible by engaging to the income generating activities. The benefit is calculated as follows;

	Bee-keeping Gross Income	Fish Processing Cost*
Without Project	28,000 Ksh/20 hives	22,500 Ksh/20 Jiko
With Project	60,000 Ksh/20 hives	11,250 Ksh/20 Jiko
Benefit	32,000 Ksh/20 hives	11,250 Ksh/20 Jiko

Note: \* Cost is for firewood purchasing

#### b) Project Cost

Total Project cost is 4,161,400 Ksh. However for the evaluation the cost for study tour and training was eliminated since it is an extra cost only for the verification projects. The financial cost and economic cost for the evaluation are therefore estimated at 395,514 Ksh and 355,166 Ksh respectively.

#### c) IRR

Based on the duration of the community building, the IRRs were calculated with 30 years flow period. FIRR and EIRR for the project are calculated at 5.0 percent and 5.3 percent respectively. The rates are both below the criteria. However introduction of Jiko will conserve natural resource and the women's labor will be spared for getting income, which is freer to use for women than men. Therefore taking into consideration the impacts on environment and gender issue, the project will still be significant.

### 2) Communal Resource Management

#### a) Benefit

The benefit of the project is increase of net profit on crop production and on livestock improvement. By the PIM activities, Crop yields are expected to increase about 50 percent in maize. By the livestock (goat) improvement, increase of breeding cycle up to 20 percent, decrease of mortality rate up to 20 percent, shortening of growth period up to 20 percent, and the rise of price up to 30 percent will be expected.

Net Profit	Crop production	Livestock (goat)
Without Project	23,834 Ksh/ha	1,710 Ksh/year
With Project	35,504 Ksh/ha	3,510 Ksh/year
Benefit	11,670 Ksh/ha	1,800 Ksh/year

#### b) Project Cost

Total Project cost is 6,243,016 Ksh (6,172,378Ksh + 99,600¥, 1Ksh = 1.41¥). However for the evaluation the cost for study tour was eliminated since it is an extra cost only for the verification projects. Also for the verification project, the component of water-saved agriculture will be implemented in only 3.6 ha (nine acres) as pilot area and the diversion work will be implemented in one-sixth of the area, while other irrigation work such as lining canal covers whole irrigation area of 240 ha (600 acres). Therefore to estimate economic impact, it is supposed that the water-saved agriculture and diversion work be implemented in the whole area. Under the assumption, financial cost and economic cost for the evaluation are estimated at 16,251,907 Ksh and 14,767,182 Ksh respectively.

#### c) IRR

Based on the duration of the irrigation work, the IRRs were calculated with 30 years flow period. FIRR and EIRR for the project are calculated at 9.8 percent and 15.0 percent respectively. IRRs are break-downed as follows;

	FIRR (%)	EIRR (%)
Crop production	9.2	14.6
Livestock improvement	31.8	30.0
Total	9.8	15.0

The IRRs for livestock improvement are calculated at quite high rates. The EIRR over the opportunity cost may suggest that the project will be significant in terms of economy.

### 3) Food Security

#### a) Benefit

The benefit of the project is same as Communal Resource Management, but the increase of crop production can be expected about 100 percent due to the present severe condition. The benefit basis is as follows;

Net Profit	Crop production	Livestock (goat)
Without Project	-349 Ksh/ha	1,710 Ksh/year
With Project	12,286 Ksh/ha	3,510 Ksh/year
Benefit	12,635 Ksh/ha	1,800 Ksh/year

#### b) Project Cost

Total Project cost is 1,663,344 Ksh (1,592,706Ksh + 99,600¥, 1Ksh = 1.41¥). However for the evaluation the cost for study tour was eliminated since it is an extra cost for only the verification

projects. The financial cost and economic cost for the evaluation are 1,548,260 Ksh and 1,364,966 Ksh respectively.

c) IRR

Based on the duration of the community building, the IRRs were calculated with 30 years flow period. FIRR and EIRR for the project are calculated at 9.5 percent and 10.6 percent respectively. IRRs are break-downed as follows:

	FIRR (%)	EIRR (%)
Rainfed Agriculture	0.4	2.3
Livestock improvement	31.8	30.0
Total	9.5	10.6

The result of very low IRRs for rainfed agriculture is due to the limited area available to install the water harvest techniques leading to comparatively quite high cost. Although the result of IRRs indicates the inadequacy of the project economically, the techniques of rain water harvest will lead soil conservation which will bring a better future for people to live in the area. Hence in terms of environment, the project should still be taken into consideration its implementation as far as the beneficiaries have interest in it.

Table I.4-1 Summary of Financial and Economic Price

(Unit: Ksh)				
Item	Unit	Financial Price	Economic Price	Remark
Maize	kg	13	11	Table U.1-2
Bean	kg	45	42	Fin.*SCF
Finger Millet	kg	33	30	Fin.*SCF
Sorghum	kg	38	35	Fin.*SCF
Groundnuts	kg	50	14	Table U.1-3
Kale	kg	23	21	Fin.*SCF
Onion	kg	27	25	Fin.*SCF
Watermelon	kg	15	14	Fin.*SCF
Maize seed	kg	91	84	Fin.*SCF
Bean seed	kg	55	51	Fin.*SCF
Finger Millet seed	kg	30	28	Fin.*SCF
Sorghum seed	kg	35	32	Fin.*SCF
Groundnuts seed	kg	60	55	Fin.*SCF
Kale seed	kg	23	21	Fin.*SCF
Onion seed	kg	2,350	2,169	Fin.*SCF
Watermelon seed	kg	500	462	Fin.*SCF
Fertilizer				
Diammonium Phosphate (DAP)	kg	30	16	Table U.1-4
Sulphate Ammonia (SA)	kg	14	6	Table U.1-5
Pesticide (Daspond)	lit.	650	600	Fin.*SCF
Tractor renting				
Ploughing	ha	3,500	3,231	Fin.*SCF
Harrowing	ha	1,400	1,292	Fin.*SCF
Ridging	ha	1,400	1,292	Fin.*SCF
Labor (unskilled)	hr	7	3.5	1)
Cattle (adult)	head	10,500	9,692	Fin.*SCF
Goat (adult)	head	900	831	Fin.*SCF

Note: SCF = 0.923

1) Shadow rate of 0.5 is applied (Referred to "The Study on Community-based Smallholder Irrigation Development Project" by JICA)

Table I.4-2 Economic Price of Maize

1. World Bank Projected Price to the year 2010 for Maize (US\$/ton in 1990 price)	96.2
2. Adjusted to 1999 price (103.56%) (US\$/ton)	99.6
3. World market equivalent (quality adjustment 90%) (US\$/ton)	90
4. Freight and insurance (US\$/ton)	40
5. CIF Monbasa (US\$/ton)	130
6. Unloading and port handling (US\$/ton)	9
7. Value at Kenya border (US\$/ton)	139
8. Converted to Ksh (US\$1=73.40Ksh)	10,173
9. Domestic handling and transport cost (to Marigat)*	1,200
10. Wholesale price in Marigat (Ksh/ton)	11,373
11. Transport to/from farm (Ksh/ton)**	615
12. Farmgate price (Ksh/ton)	10,758
13. Farmgate price (Ksh/kg)	11

Source: World Bank Global Commodity Markets October 1999, and JICA Study team  
Note: \* 1300Ksh\*SCF, \*\* 666Ksh\*SCF

Table I.4-3 Economic Price of Groundnuts

1. World Bank Projected Price to the year 2010 for Maize (US\$/ton in 1990 price)	133.2
2. Adjusted to 1999 price (103.56%) (US\$/ton)	137.9
3. Freight and insurance (US\$/ton)	40
4. CIF Monbasa (US\$/ton)	178
5. Unloading and port handling (US\$/ton)	9
6. Value at Kenya border (US\$/ton)	187
7. Converted to Ksh (US\$1=73.40Ksh)	13,719
8. Domestic handling and transport cost (to Marigat)*	1,200
9. Wholesale price in Marigat (Ksh/ton)	14,919
10. Transport to/from farm (Ksh/ton)**	615
11. Farmgate price (Ksh/ton)	14,304
12. Farmgate price (Ksh/kg)	14

Source: World Bank Global Commodity Markets October 1999, and JICA Study team  
Note: \* 1300Ksh\*SCF, \*\* 666Ksh\*SCF

Figure I.1-1

**Verification Project ① Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases**

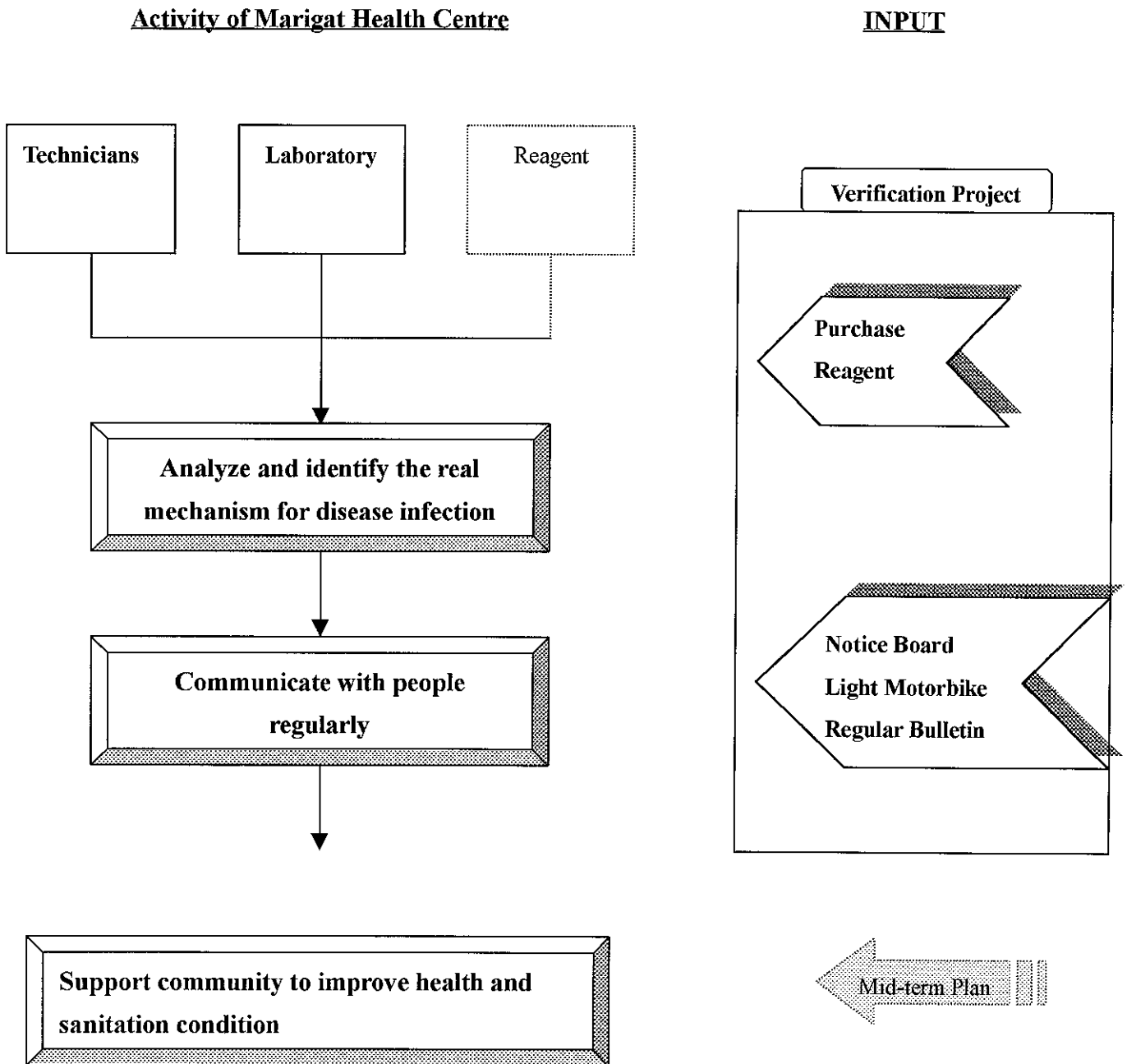
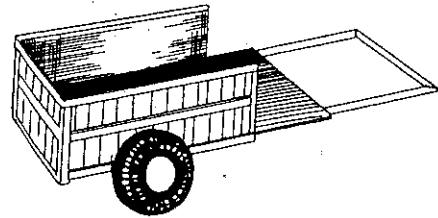
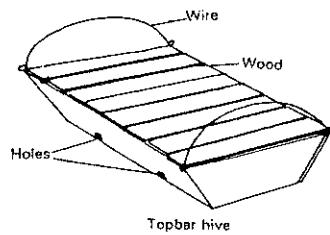


Figure I.1-2

## Verification Project ② Strengthening of Marigat Youth Polytechnic

1. New Items for the Woodworking Course at Marigat Youth Polytechnic (Making of KTBH, Cart)
2. Invitation of Trainer
3. Supply of Equipment
4. Schooling
5. Demonstration of Tools Made by the School
6. Organize People to try to use cart and provide KTBH to bee-keeping group



Demand of KTBH will be expected to increase by the Development Plan  
Cart will be utilized in the community activities

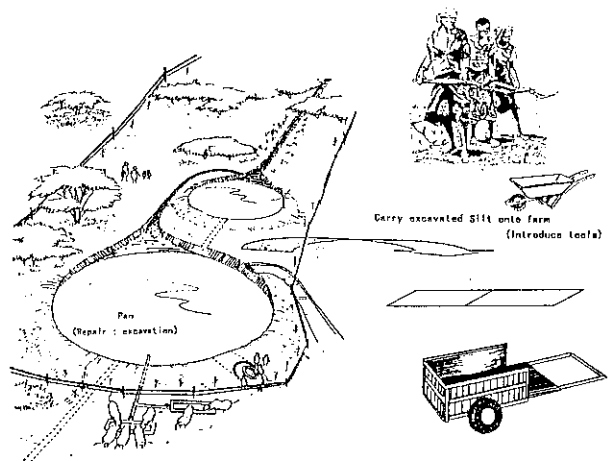
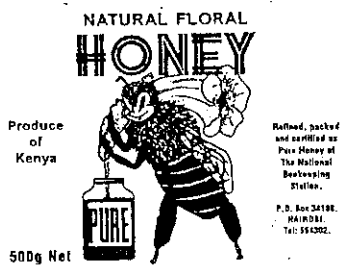
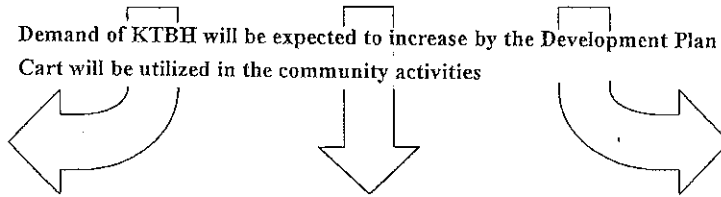


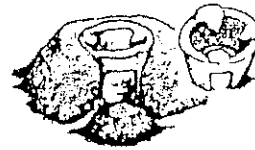


Figure I.1-3

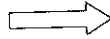
Verification Project ③ Improved Stove + Small Scale Industry  
(Bee-keeping, Fish Processing)



Traditional Stove



Improved Jiko



*Increase of heat efficiency* → *Forest conservation*  
*Saving of firewood*  
*Saving of labor for fetching* → *Shifting of labor*  
*firewood by women* → *into small scale industry*



<Bee-keeping>

Construction of refinery → Sell crude honey to Nakuru, Nairobi

Marketing → Packaging improvement (Whisky bottle → Special container), Advertisement (designing label, etc.)

Training for leaders, accountant, honey making

<Fish Processing>

Improved Jiko ( Fry fish ) → Saving of firewood → Cost reduction

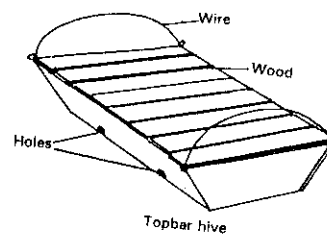
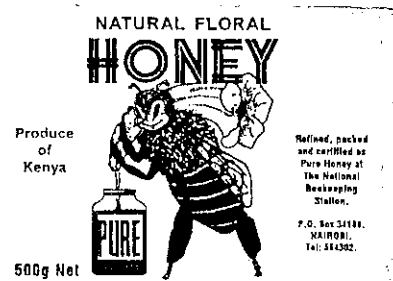


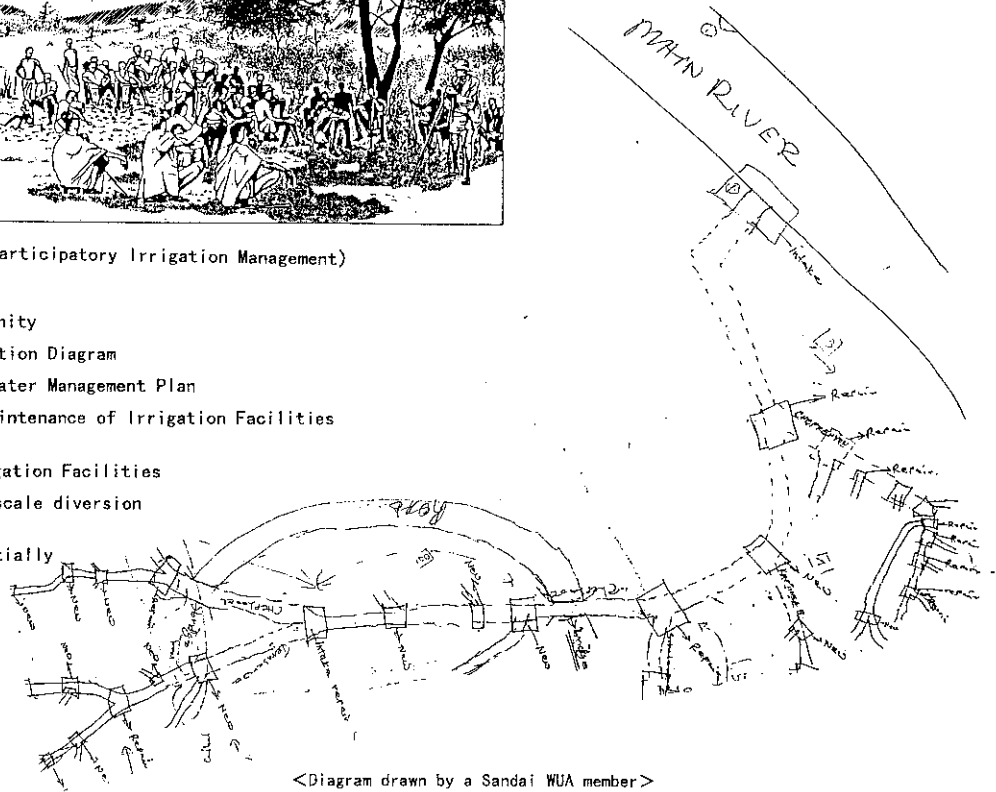
Figure I.1-4

Verification Project ④ Communal Resource Management (PIM+Livestock Improvement)



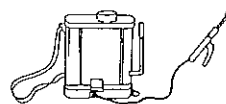
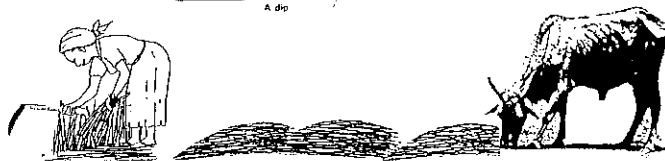
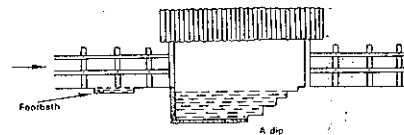
PIM (Participatory Irrigation Management)

1. Activities by community
  - Making of Irrigation Diagram
  - Formulation of Water Management Plan
  - Operation and Maintenance of Irrigation Facilities
2. Improvement of Irrigation Facilities
  - Construct small scale diversion boxes and gates
  - Lining canal partially
3. Water saving agriculture
  - Land leveling
  - Introduce quality seeds



<Livestock Improvement>

- 1) Animal Health Control
  - Rehabilitate dip
  - Introduce sprayer
  - Reorganize dip community



- 2) Livestock Up-grading
  - Promote cross breeding System
  - Promote castrating system
  - Promote cut and carry system (utilize by-product of crops)

Figure I.1-5

Verification Project ⑤ Rehabilitation of Pan

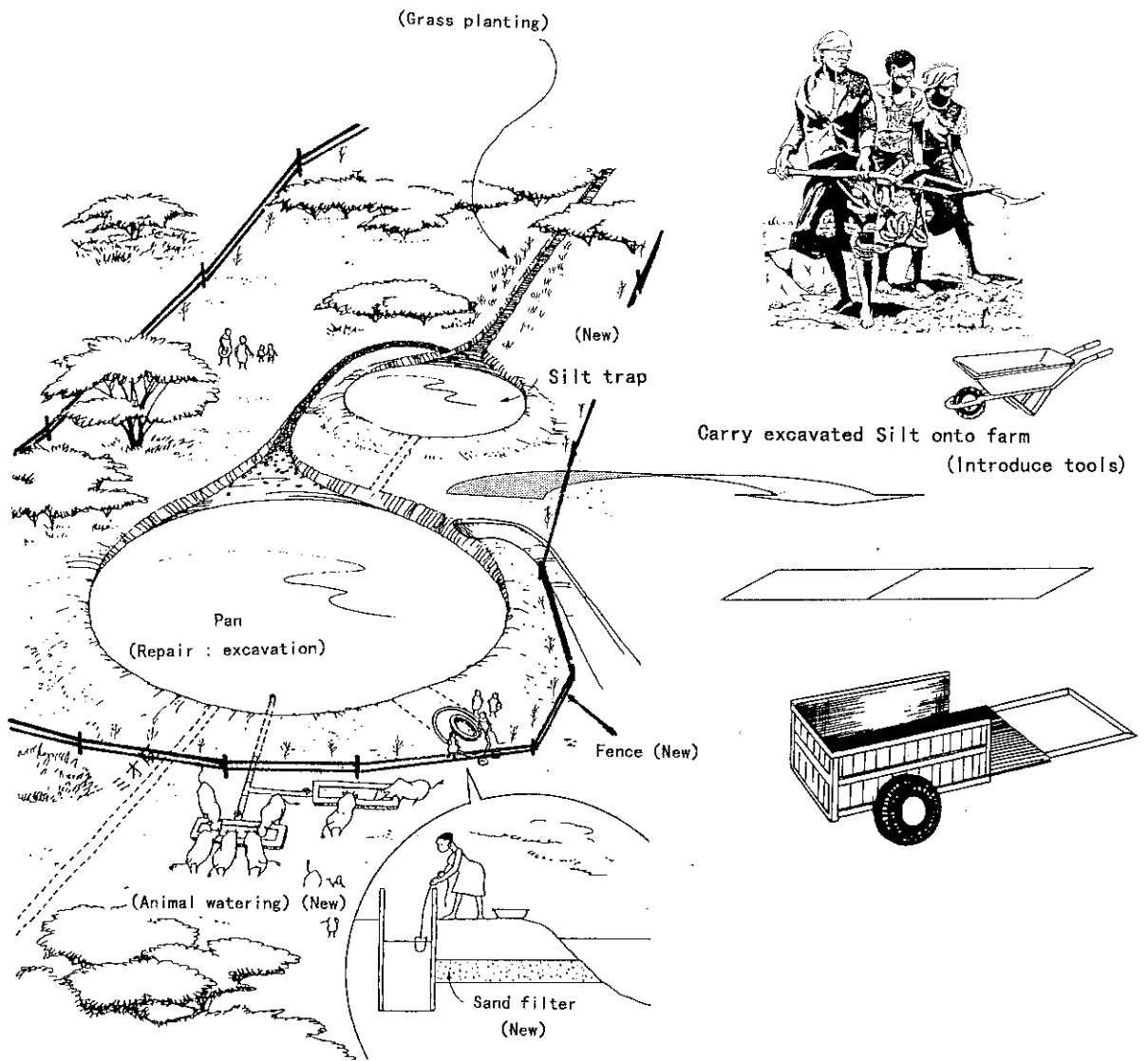


Figure I.1-6

Verification Project ⑥ Food Security (Livestock Improvement + Rain Water Harvesting)

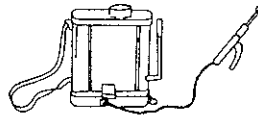
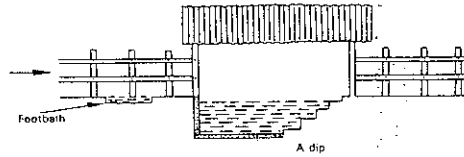
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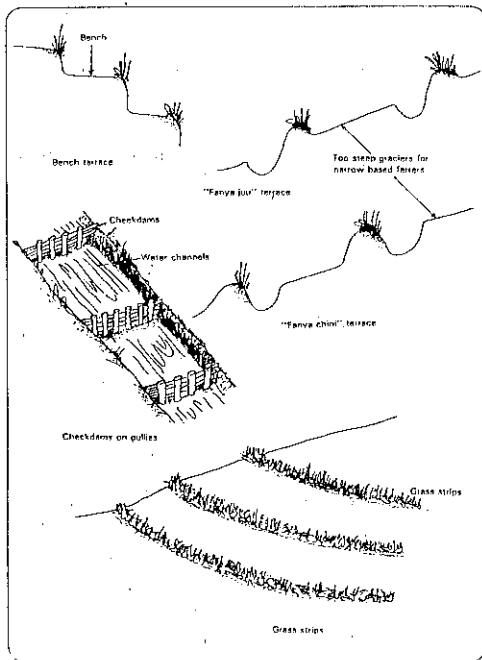
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2. Rain Water Harvesting

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- Construct silt trap
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Structural Measures of Conservation

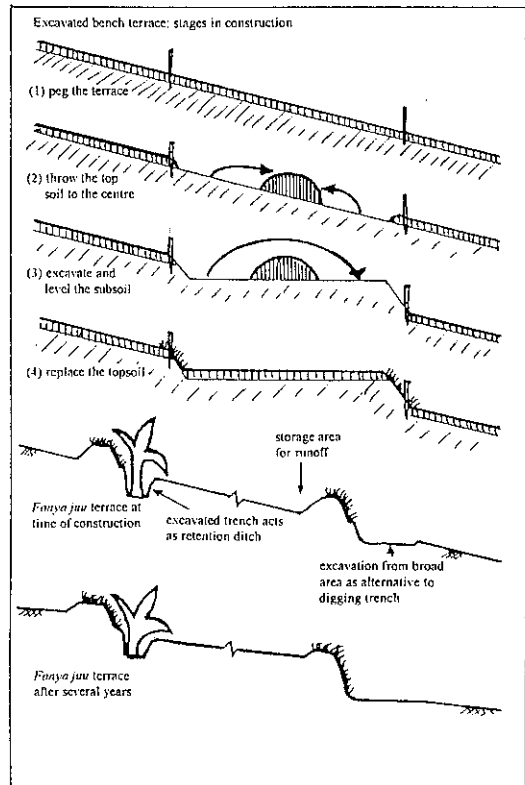


Figure I.1-7

Verification Project ⑦ Learning from Best Practices



Kerio Valley : SARDEP Project (Presentation on the Rural Water Supply Project by community members)



Kitui District : JICA Forestry Extension Model Development Project for Semi Arid in Kenya

Figure I.1-1

**Verification Project ① Surveillance, Information and Support System Improvement of Epidemic and Endemic Diseases**

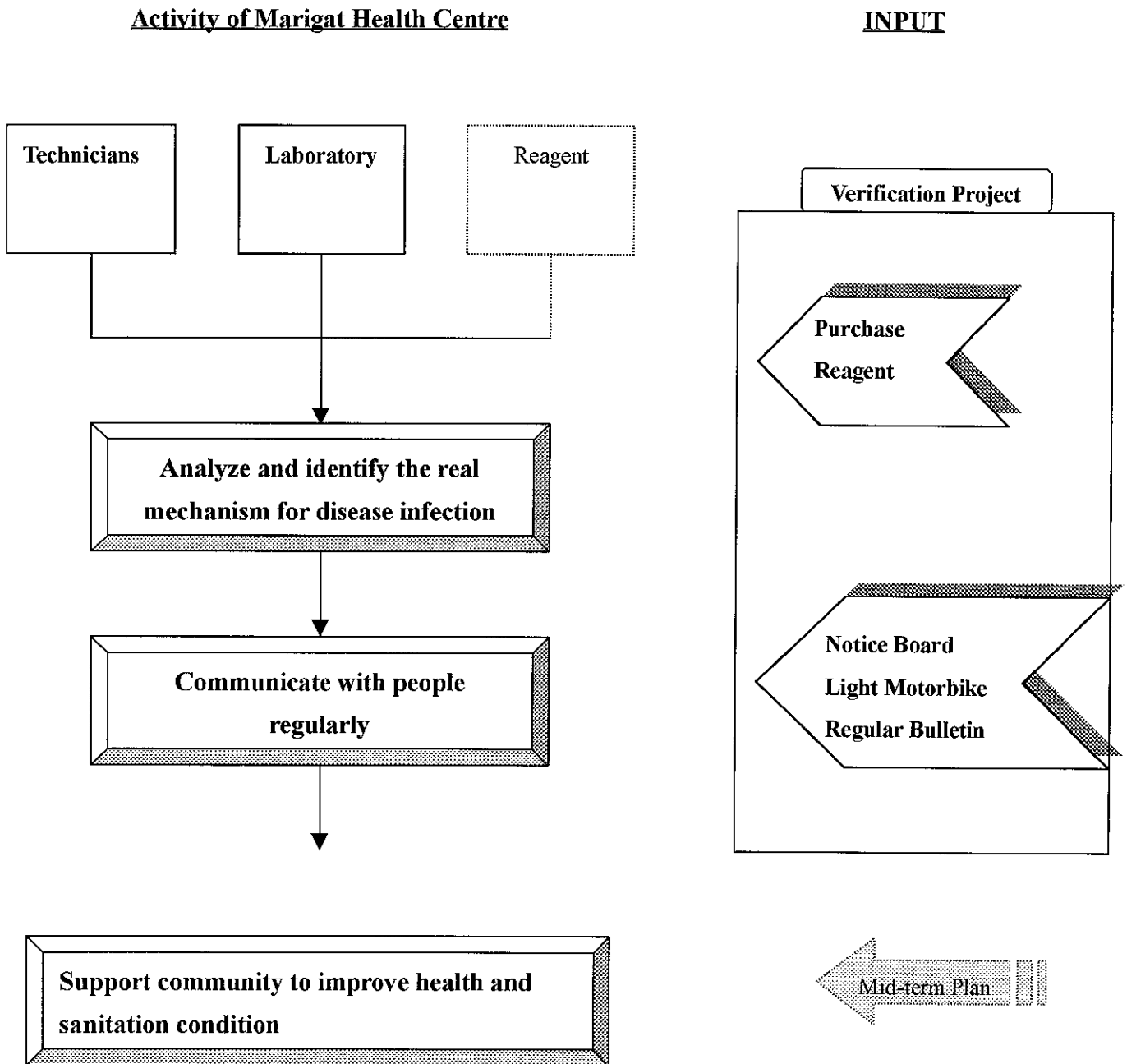
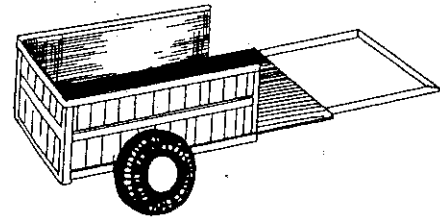
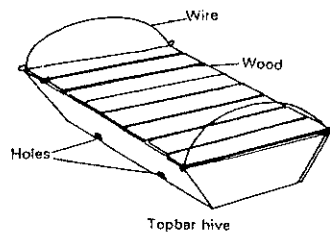


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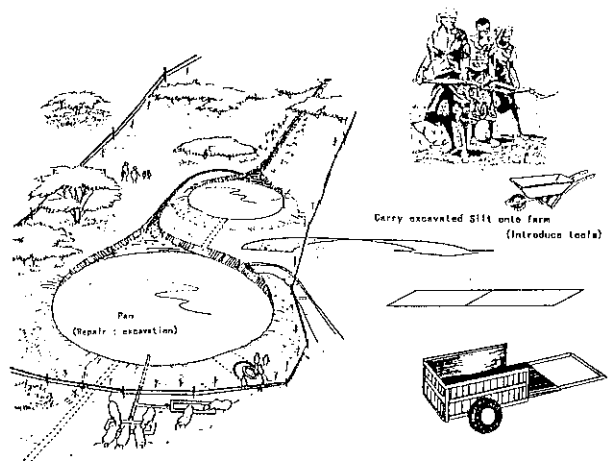
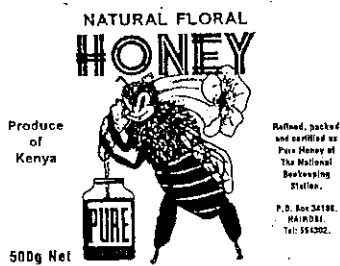
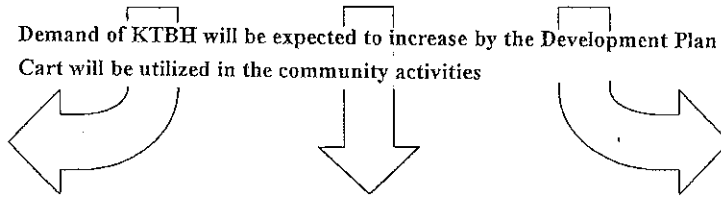
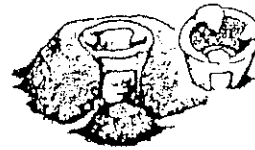


Figure I.1-3

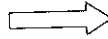
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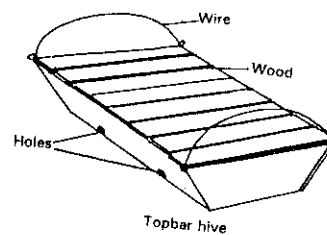
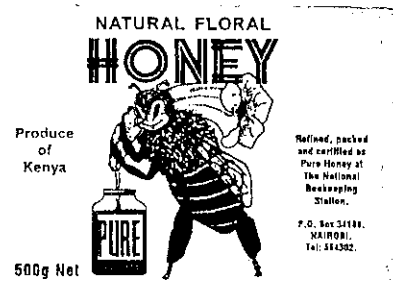




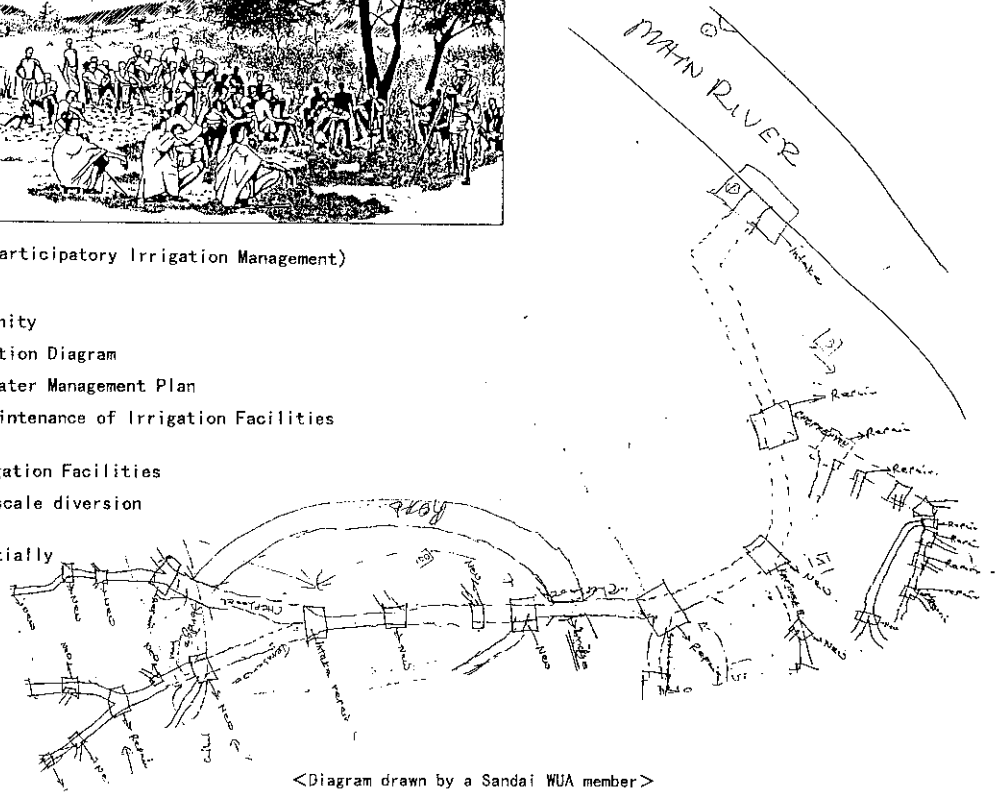
Figure I.1-4

Verification Project ④ Communal Resource Management (PIM+Livestock Improvement)



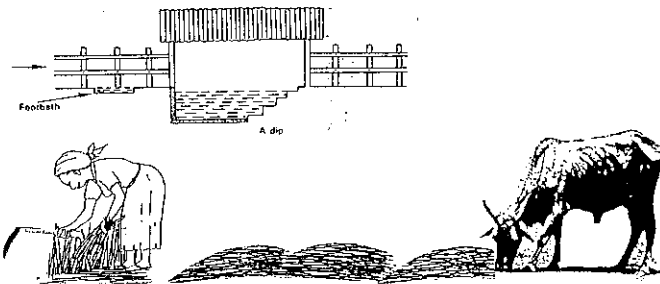
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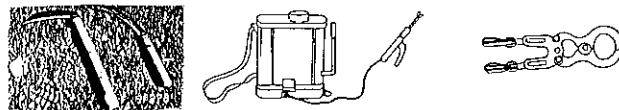


Figure I.1-5

Verification Project ⑤ Rehabilitation of Pan

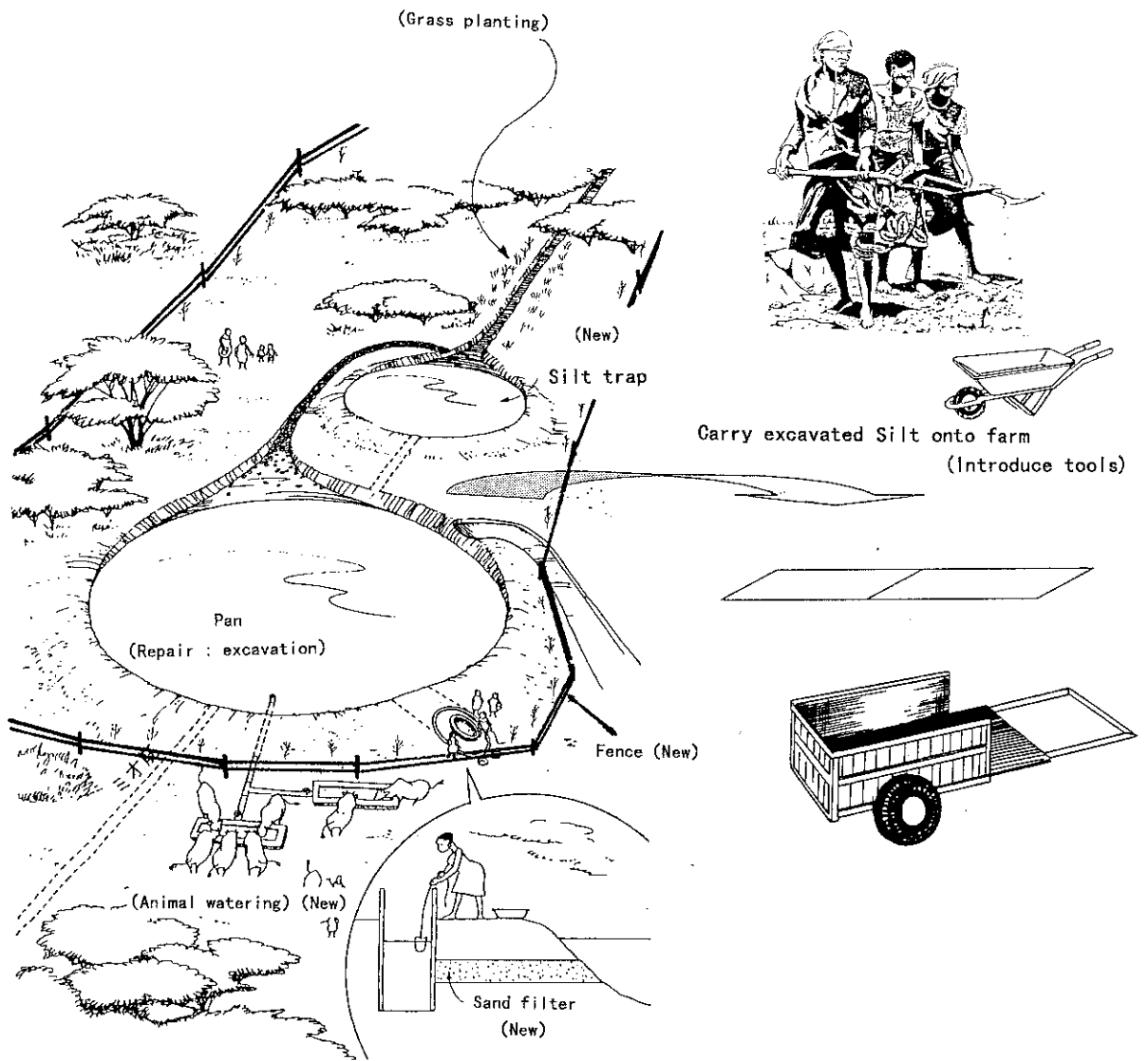


Figure I.1-6

Verification Project ⑥ Food Security (Livestock Improvement + Rain Water Harvesting)

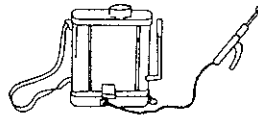
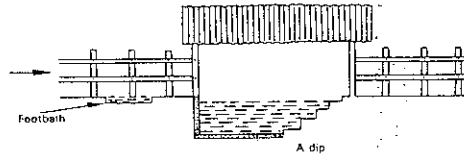
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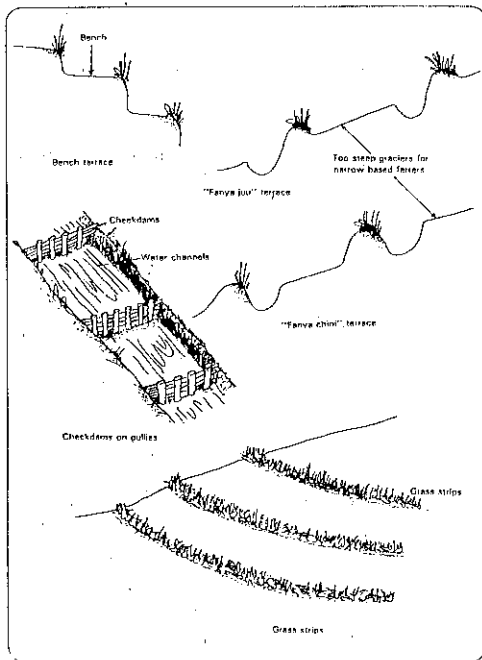
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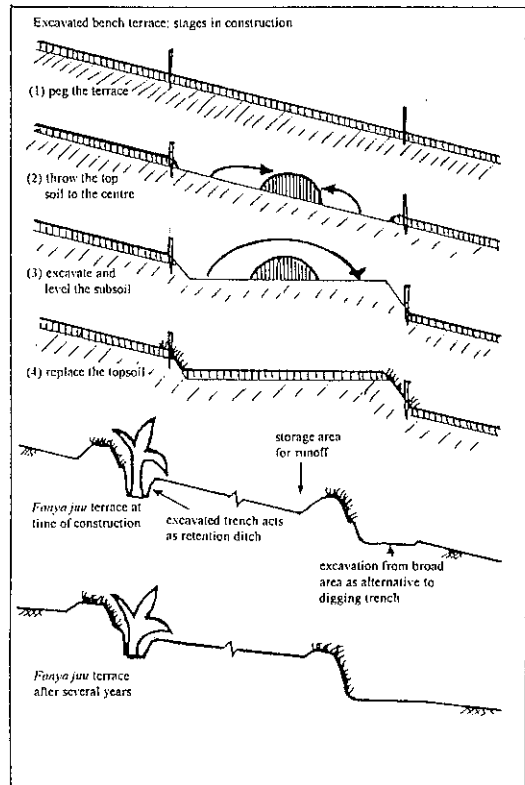


Figure I.1-7

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