English Version

Part I

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Schedule of Final Evaluation Mission (FINAL)

Italics is schedule of Japanese Member

5th April 2002

Date	Time	Time	Detail	Venue	Memo
6th Apr.		*Departure from Tokyo*			
7th Apr.		*Arrival in Kenya*		*J.K.I.A.*	
8th Apr.		*JICA Office (Japanese Team)*			
Mon		*Embassy of Japan(Japanese Team)*			
	15:00	Courtesy Visit to Permanent Secretary, Amb. Francis K. Muthaura			KET, JE, J, SOFEM-J
		Meet Chief Conservator of Forest			
		Meet Director KEFRI			
		Interview to CCF and Director KEFRI			KE, JE
9th Apr.	8:30	Leave for Kitui			
Tue		11:00	Arrival in Tiva Pilot Forest		KET, JE, D, SOFEM-J
		13:30	Lunch at KEFRI Kitui Centre		KET, JE, D, SOFEM-J
		15:00	Visit District Forest Office		KET, JE, D, SOFEM-J
		15:30	Presentation on SOFEM Activities	KEFRI Kitui	KET, JE, D, SOFEM
		16:00	Briefings on Evaluation Method and Schedule		KET, JE, D, SOFEM
		- -	Interview to Japanese Experts	KEFRI Kitui	KE, JE
10th Apr.		8:30	Leave for the fields		KET, JE, D, SOFEM-J
Wed		9:30	Visit Farmer (Extension 1) Mrs.Edith Kyenze	Chuluni	KET, JE, D, SOFEM-J
		~	Visit SFTP Model Farmer Mr.Robert Maluki Kitheka	Chuluni	KET, JE, D, SOFEM-J
		~	Visit Farmer (Extension 2) Mrs.Fridah Mutiambai	Chuluni	KET, JE, D, SOFEM-J
		13:00	Lunch	KEFRI Kitui	KET, JE, D, SOFEM-J
		14:30	Presentation of Farm Forest Establishment Evaluation	Tiva	KET, JE, D, SOFEM
			Interview to Japanese Experts		KE, JE
		18:30	Reception (Hosted by Japanese Side)	KEFRI Kitui	All staff of SOFEM
11th Apr.		8:30	Visit Farmer (On-Farm 1) Mr.David Ngonde	Mutomo	KET, JE, D, SOFEM-J
Thu		~	Visit Farmer (Extension 3) Mr.Joseph Kivelenge	Chuluni	KET, JE, D, SOFEM-J
		~	Visit Farmer (On-Farm 2) Mr.Batholomew Mutia	Chuluni	KET, JE, D, SOFEM-J
		13:30	Lunch	KEFRI Kitui	KET, JE, D, SOFEM-J
		14:30	Interview to FD DFO, DFEOs	FD Kitui	KE, JE
		16:00	Pre-discussion "Final Minutes"	KEFRI Kitui	KET, JE, D, SOFEM-J
12th Apr.		8:30	Study on Information Activities	KEFRI Kitui	KET, JE
Fri		10:00	Visit Farmer(Extension 4) Mr.Mutava Ndothya	Kabati	
		~	Visit Farmer(Extension 5) Mrs.Mary Kasyula	Central	
		12:30	Leave for Nairobi		
13th Apr. Sat		Documentation (If any)			
14th Apr. Sun		Documentation (If any)			
15th Apr.	9:00	*Discussion Japanese side*		*JICA Office*	
Mon	14:00	1st Discussion		FD HQ	All staff of SOFEM
16th Apr.	9:00	2nd Discussion		KEFRI HQ	All staff of SOFEM
Tue		(13:00 Reception (Hosted by Kenyan Side))			
17th Apr.	9:00	Making Final Minutes by Joint Evaluation Team		FD HQ	KE, JE
Wed	PM	*Visit ICRAF(Japanese Leader)*			JE
	PM	*Documentation*			
18th Apr.	12:00	Report to the Ministry (P.S.) and sign the minutes		M.E.N.R.	KET, JE, D, C, J, SOFEM-J
Thu	13:00	Reception (Hosted by Japanese Team)		Fair View Hotel	
		Report to JICA Office and EOJ (Japanese Team)			JE
	22:55	*Leave for Tokyo*			

KET	Kenyan Evaluation Member including Technical Advisors
KE	Kenyan Evaluation Member without Technical Advisors
JE	Japanese Evaluation Member
SOFEM	SOFEM Project Staff
SOFEM-J	SOFEM Japanese Staff
J	JICA Kenya Officials
D	Director KEFRI
C	CCF FD

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	~	Visit Farmer (Extension 2) Mrs.Fridah Mutiambai		Chuluni	KET, JE, D, SOFEM-J
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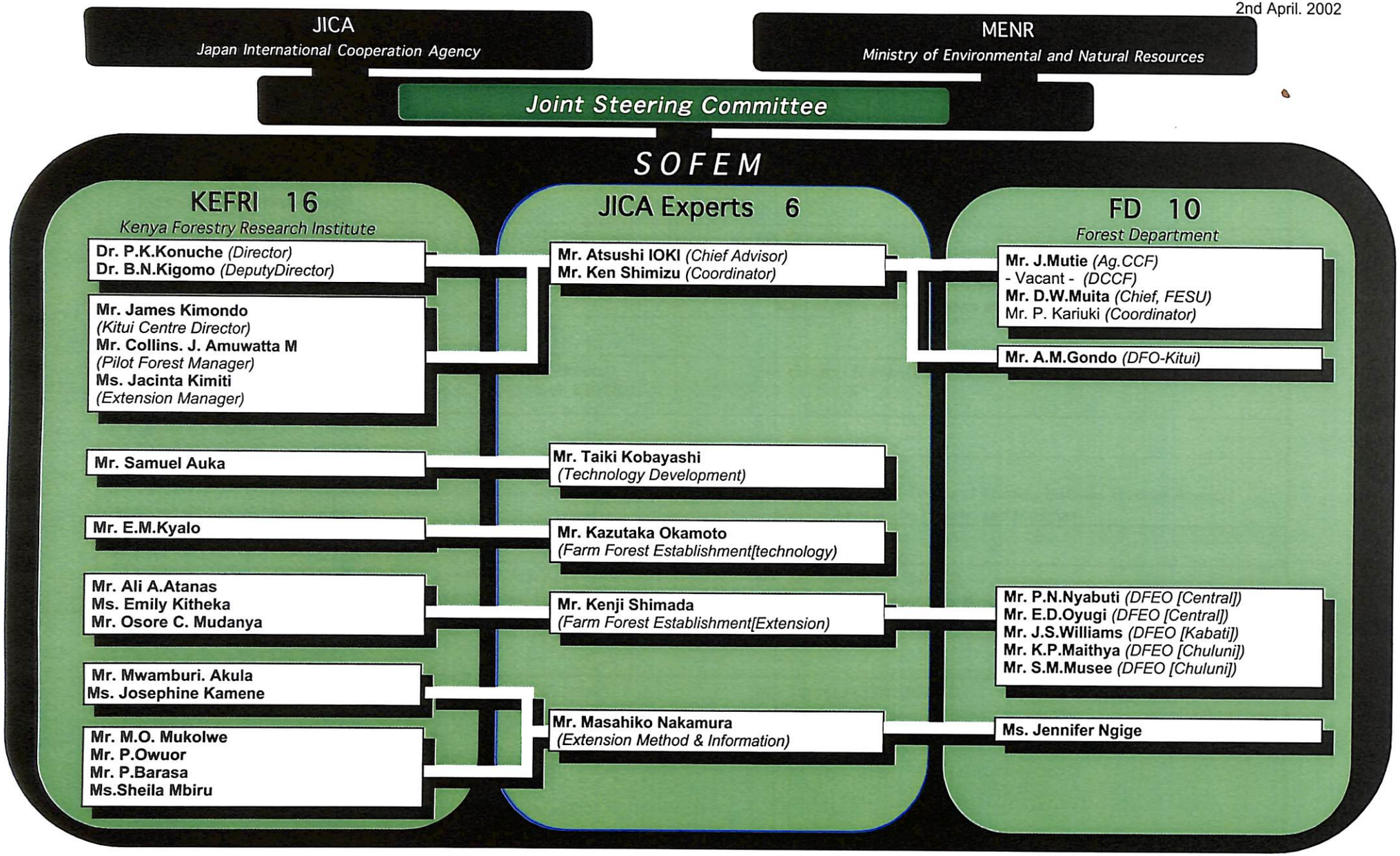
ORGANIZATION CHART OF THE PROJECT

SOFEM (Social Forestry Extension Model Development Project for Semi-arid Areas in Kenya)

2nd April. 2002



Members of Final Evaluation Team (Final)

SOFEM

8th April, 2002

FIELDS	KENYAN SIDE - 10 -	JAPANESE SIDE - 5 -
1. Leader		
	Dr. Ben. Chikamai National Coordinator, Dryland forestry, KEFRI	Mr. Hideki MIYAGAWA Director, Forestry and Natural Environment Department, JICA HQ
	Mr. D.K. Mbugua Deputy CCF(FE & P), Department of Forest	
2. Technology Development		
	Mr. James Kimondo(Technical Advisor) Centre Director, KEFRI Kitui, KEFRI	Mr. Osamu SHIMADA Section Chief for Planning, Management Division, National Forest Department, Forestry Agency, Min. of Agriculture, Forestry and Fisheries
3. Farm Forest Establishment		
	Ms. Jacinta Kimiti(Technical Advisor) Extension Manager, KEFRI Kitui, KEFRI	*Mr. Osamu SHIMADA(Serving concurrently above field)*
4. Extension Method		
	Ms. Jane F. Wamboi Forestry Extension Division, Department of Forest	Mr. Keiji IMAI Division Director, Technical Training Institute, Forestry Agency, Min. of Agriculture, Forestry and Fisheries
5. Planning Evaluation		
	Mr. P. Kariuki(Technical Advisor) Forestry Extension Division, FD(Project Coordinator)	Mr. Hiroyuki HASHIMOTO Forestry and Environment Division, Forestry and Natural Environment Department, JICA HQ
6. Participatory Evaluation		
	Mr. M.O. Mukolwe(Technical Advisor) Training Manager, KEFRI Mr. Ben Wandago Conservator Forests - in charge of project development Mr. J. K. Macharia National Programme Coordinator, FD Mr. M. Wanyiri District Forest Officer, Mwingi	Mr. Tsuneo KUWAHAWA Consulting Engineer, NIPPON GIKEN INC.

FD=Department of Forest KEFRI=Kenya Forestry Research Institute

SOFEM Tentative Evaluation Table

Date; 5 April 2002
Kenya Evaluation Team

Name	**The Social Forestry Extension Model Development Project for Semi-arid Areas in Kenya**
Cooperation Country	Kenya/Japan
Term	1997.11.26～2002.11.25 (5Yr)
R／D	1997.10.22
Section	Forestry Technical Extension
Implementation Agency	Kenya Forestry Research Institute Ministry of Environment and Natural Resources Forestry Department, Ministry of Environment and Natural Resources
Counter Agency	Agency of Forestry, JICA
Evaluation Team	Kenya Japan
Evaluation Date	
PDME	Attached

I. Project History and Background

1. Background	The cooperation between Kenya and Japan is started in 1985 as the Nursery Training Center for Social Forestry, preparatory phase. From 1988 we start the project type cooperation project named "the Social Forestry Training Project" and "the Social Forestry Training Project Phase II (SFTP II)", which had been forced on training and technical development In fields of nursery, afforestation and extension. Base on the output of the project, Japan and Kenya joint evaluation team agreed that further technical assistance Is needed to achieve the overall goal of the project namely, "Rural people In Kenya are equipped with appropriate tree planting and management skills". For this purpose It was mentioned that extension activities should be the core component of the proposed phase supported adaptive technological development. The team also recommended for future project as follow: A. Establishment of Integrated demonstration models B. Strengthening collaboration between relevant organizations C. Establishment of Innovative mechanism for extension D. Verification of development technologies and production of comprehensive technical package.
2. Procedure of making plan (1) Preliminary study (Preliminary study)	1997.8.17～1997.8.30(14days) Under the preliminary study based on the joint evaluation of the SFTP II, under matters were agreed; (1)Project Title; The Social Forestry Extension Model Development Project for Semi-arid Areas In Kenya" It was revised from "The Social forestry Research and Extension Project". (2)Term:1997.11.26～2002.11.25 (3)Implementing Organization: KEFRI, FD (4)Overall goal; The Inhabitants of semi-arid area In Kenyua are equipped with appropriate techniques to plant trees and manage them. (5)Project Purpose: A social forestry extension model Is developed through establishment of farm forests In semi-arid areas by local residents (6)Out put 1 practical techniques for planting and tending trees for establishment of farm forests are provided 2 Appropriate methods of establishing farm forests with Initiative of the local resident are developed. 3 Capability of extension agents Is Improved 4 Information on social forestry extension Is shared among the people and other related organizations. (7) Activity 1 to develop practical techniques for establishment of farm forests In semi-arid areas 2 To design, establish, monitor and evaluate model farm forests 3 To train extension agents and develop appropriate extension methods 4 To collect, synthesize and disseminate Information on social forestry extension (8)Project Area: Four Division of eight Division in Kitui District; One or two Priority are Is appointed by each Division.(not mentioned In the Minuets)

(2) Signing of R/D for Implementation	1997.11.22 Under the agreement of the Preliminary Study, R/D for Implementation of this 5-year project was signed among Tagami Minoru, JICA Resident Representative Kenya Office, Wamatu NjorogeVice Permanent Secretary, Ministry of Reserch, Technical Training and Technology, William P. Mayaka, Permanent Secretary, Ministry of Environment and Natural Resources and Simeon S. Lesrima Permanent Secretary, Ministry of Finance. And at same occasion, TSI(Tentative Schedule of Implementation) was signed.

3.Imprimentation Process Planning	1998.5.7 ～ 5.15 (9days) At half years later of starting of cooperation, "monitoring and Evaluation Plan(Included PDM(Project Design Matrix) and PO(Plan of Operation) was agreed. In this chance, some parts of basic design/agreement was amended. (1) Development of technology on station should concentrate to - Priorities to practical technology which farmer use easily. -to base on last 12 years effort. -to concentrate to possible task by means of term, manpower and budget. (2) On farm trial will imperilment different farmer from who participate to establishing farm forest(the core farmer)r. (3) Activity/Out put "To train extension agents and develop appropriate extension methods" was excluded. (4) Project title was amended to "The Social Forestry Model Development Project In Semi-arid Area"
Mid term Evaluation	2000.4.8 ～ 2000.4.22 (15dats) At the chance of after the two and half years of starting of the Project, mid term evaluation was carried out jointly, and some Improvement and recommendation was agreed for a smooth achievement of the project porous. (1) PDM was not changed except some verifiable Indicator and Important assumption but some plan of operation at activity 2 was modified.

4. Particular matters on implementation (1) Modification of initial plan on implementation - Important Assumptions - Input - Activity - Output - Precondition - Verification	- May, 1998, the planning agreement excluded "To train extension agents and develop appropriate extension methods". - April, 2000, Mid term evaluation modified ; "Formulate strategic plan for promoting farm forest establishment by local resident' from "Formulate plan of farm forest establishment" ; "Establish farmer to farmer extension system" was added. ;"Improved demonstration plot In Tiva (Demo II)" become sub activity from one of sub activity. ; "Establish farm forest" Integrate from "Establish farm forest by extention agents" - June, 2001, the Joint Steering Committee meeting added ; Soil map of the Pilot Forest ; Develop a social forestry extension model
(2) Modification of Implementation system	In 1999.9, KEFRI and FD become Ministry of Environment and Natural Resources.
5.Rerated Project	JICA (1) 1985.11.～, 2Yr;The Nursery Training and Technical Development Project (Preparatory Phase) (2) 1987.11.～ 5Yr; The Social Forestry Training Project (SFTP I) (3) 1985, Nursery Training Center (Grant Aid)

	(4) 1992.11～, 5Yr The Social Forestry Training project Phase II (SFTP II) (5) 1994 年 Nursery Training Center phase II (Grant Aide) (6) 1995～1999 The Third country Training (7) 2000～2004 The Third Country Training Phase II Other ODA (1) ASALs tree plantation program (DANIDA/IFAD) (2) Master plan (FINNIDA) (3) Natural forestry management (EU/EDF/AFDB) (4) Training (GTZ) (5) Afforestation program (WFP) (6) Biodiversity Conservation (FO/GEF) (7) Agroforestry(ARIDSAK) (Bergen) (8) Ukanbani(3 district) farm forestry project(DFDP), 1997～2001preparatoryufhase、2001～2004 Implementation phase(Bergen) (9) 2000.4, Israel small Irigation agriculture (KIP), cooperate with SOFEM(R/D) NGO which activities are Agroforestry or Tree nursery. (1) Kenya Energy Non-Governmental Organization (2) Church of the Province of Kenya (3) Action AID (4) ICA, Small Scale Agriculture Village Development(Kitui); 2001～2004, JICA Development Partnership

II. Achievement of Plan

Narrative Summary	Indicator	Result (2002.4)	Assumption
Overall Goal The inhabitants of semi-arid areas in Kenya are equipped with appropriate techniques to plant trees and management them	'- Number of inhabitants who adopted more appropriate method of social forestry extension in semi-arid areas		Government policy to promote farm forestry does not change in the long run
Project Purpose A social forestry extension model for semi-arid areas is developed through establishment of farm forest by local residents	'- By March 2002, sustainable extension methods would have been established - By March 2002, over 300 farm forest would have been established	- By the Task Force, - +++ farmer forests will take part in the SOFEM process of farm forest establishment	- Need for tree products, social forestry techniques and extention services by farmers do not change. - Weather condition, such as rainfall, does not change drastically. -Adequate number of extension agents and their operation fund are timely provided
Out put			
Output1 Practical techniques for planting and tending trees for establishment of farm forest are provided	- By March 2002, above 19 technologies would have been developed based on original plan (On-station). - By March 2002, above 5 technologies would have been verified through On-farm stations based on original plan (on-farm) - By March 2002, above 13 technical report or manujal would have been made (On-station and On-farm)	- Above 19 technologies have been developed based on original plan (On-station) - Above 5 technologies have been verified through On-farm stations based on original plan (On-farm) - Above 13 technical reports or manuals have been made (On-station and On-farm)Accomplished as a plan - At the Social forestry Seminar, over 20 reports was presented by counterparts. - Over 5 technologies have been feed-backed and experimented.	
Output2 Appropriate methods of establishing farm forests and its extension are developed	- By march 2002, about 60 farmers shall take part in the process of farm forest establishment - As of March 2002, more than 70% of the farmers would have been satisfied with the extension methods in the above level 4 of 5 lank in term of; * technical kevel * cost-effectiveness etc. - As of march 2002, more than 90% of the extention agents evaluate the suitability of the extention methods in the above 4 0f 5 ranks evaluation in terms of ; * technical level * system of implementation etc.	-	

Narrative Summary	Indicator	Result (2002.4)	Assumption
Output3 Information on social forestry extension is shared by the people and other related organizations	- By March 2002, the following outcomes would have been expected for farmers, extention agents and the others. * Over 5,000 copies of the "News Letters distribution * Over 7,000 participants of mobile shows - As of march 2002, over 50 % of the people who have received the above information utilize it - As of March 2002 over 50% of the farmers disseminate the information they have received to others in some way	The following outcomes expected for farmers, extension agents and the others; - 5,000 copies of the News Letter - 7,000 participants of the mobile show - ++% of the person used it - ++% of the farmers disseminated	

Activities

1. Develop practical technique for establishment of farm forests in semi-arid areas
   1.1. Develop technology in the Pilot Forest
   1.2. Verify practical technologies by on-farm experiments
   1.3. Prepare technical manuals

2. Design, establish, monitor and evaluate farm forests, and build extension methods
   2.1. Establish farm forest in SFTP (II) target area
   2.2. Collect and analyze information concerning establishment of farm forest
   2.3. Formulate strategic plan for promoting farm forest establishment by local residents
   2.4. Establish farm forests
   2.5. Establish farmer to farmer extension system
   2.6. Improve demonstration plots in Tiva (DEMO Ⅱ)
   2.7. Feedback of technical knowledge of planting and tending into the technology development
   2.8. Intermediate evaluation
   2.9. Review of plan of farm forest establishment
   2.10. Final evaluation and compilation of the results of the activities

3. Collect, synthesize and disseminate information on social forestry extension
   3.1. Make preparations for information activities
   3.2. Hold regular meetings
   3.3. Collect and analyze of information from outside sources
   3.4. Collect of information accumulated through project activities
   3.5. Develop extension materials on establishment of farm forest for extension agents
   3.6. Disseminate information through publications and events
   3.7 Develop a social forestry extension model activity

Input by Japan

1, Expert
   6 long-term experts in the following fields
   - Chief Adviser
   - Technical Development
   - Farm Forest Establishment (technology)
   - Farm Forest Establishment (extension)
   - Extension method and information
   - 2-3 short term experts par year,

2, Training in Japan
   - 2-3 counterparts per year

3, Equipment

4, Sharing of running expenses
   - for plantation
   - for extension

Input by Kenya

1, Counterpart
   - Project Director
   - Project Manager
   - Project Coordinator
   - Counterparts
     PF Manager
     Extension manager
     Forest Ext. Officer
     Training Office
     Research Officer
   - Administrative staff
     Clarks
     Drivers & Labors
     Other supporting staff

2, Land & building

3, Running expenses for the implementation of the project

- Weather condition, such as rainfall, does not change drastically during the projec
- Cooperation By the farmers and related institutions are obtained
- Inputs form both sides are timely and adequately provided

Preconditions

- Outputs of former phases are utilized
- Residents' needs accord with the project purpose

Narrative Summary	Indicator	Result (2002.4)	Assumption
Output3 Information on social forestry extension is shared by the people and other related organizations	- By March 2002, the following outcomes would have been expected for farmers, extention agents and the others. * Over 5,000 copies of the "News Letters distribution * Over 7,000 participants of mobile shows - As of march 2002, over 50 % of the people who have received the above information utilize it - As of March 2002 over 50% of the farmers disseminate the information they have received to others in some way	The following outcomes expected for farmers, extension agents and the others; - 5,000 copies of the News Letter - 7,000 participants of the mobile show - ++% of the person used it - ++% of the farmers disseminated	

Activities	Input by Japan	
1. Develop practical technique for establishment of farm forests in semi-arid areas 1.1. Develop technology in the Pilot Forest 1.2. Verify practical technologies by on-farm experiments 1.3. Prepare technical manuals 2. Design, establish, monitor and evaluate farm forests, and build extension methods 2.1. Establish farm forest in SFTP (II) target area 2.2. Collect and analyze information concerning establishment of farm forest 2.3. Formulate strategic plan for promoting farm forest establishment by local residents 2.4. Establish farm forests 2.5. Establish farmer to farmer extension system 2.6. Improve demonstration plots in Tiva (DEMO II) 2.7. Feedback of technical knowledge of planting and tending into the technology development 2.8. Intermediate evaluation 2.9. Review of plan of farm forest establishment 2.10. Final evaluation and compilation of the results of the activities 3. Collect, synthesize and disseminate information on social forestry extension 3.1. Make preparations for information activities 3.2. Hold regular meetings 3.3. Collect and analyze of information from outside sources 3.4. Collect of information accumulated through project activities 3.5. Develop extension materials on establishment of farm forest for extension agents 3.6. Disseminate information through publications and events 3.7 Develop a social forestry extension model activity	1, Expert 6 long-term experts in the following fields - Chief Adviser - Technical Development - Farm Forest Establishment (technology) - Farm Forest Establishment (extension) - Extension method and information - 2-3 short term experts par year, 2, Training in Japan - 2-3 counterparts per year 3, Equipment 4, Sharing of running expenses - for plantation - for extension Input by Kenya 1, Counterpart - Project Director - Project Manager - Project Coordinator - Counterparts PF Manager Extension manager Forest Ext. Officer Training Office Research Officer - Administrative staff Clarks Drivers & Labors Other supporting staff 2, Land & building 3, Running expenses for the implementation of the project	- Weather condition, such as rainfall, does not change drastically during the projec - Cooperation By the farmers and related institutions are obtained - Inputs form both sides are timely and adequately provided **Preconditions** - Outputs of former phases are utilized - Residents' needs accord with the project purpose

Reference (Achievement of Plan)

Narrative Summary	Indicator	Result (2002.4)	Assumption
Overall Goal The inhabitants of semi-arid areas in Kenya are equipped with appropriate techniques to plant trees and management them	'- Number of inhabitants who adopted more appropriate method of social forestry extension in semi-arid areas		Government policy to promote farm forestry does not change in the long run
Project Purpose A social forestry extension model for semi-arid areas is developed through establishment of farm forest by local residents	'- By March 2002, sustainable extension methods should be developed	- Over 500 farmer forests will take part in the SOFEM process of farm forest establishment	-Adequate number of extension agents and their operation fund are timely provided
Out put Output1 Practical techniques for planting and tending trees for establishment of farm forest are provided	- By March 2002, over 300 farmers will use developed technology developed by feed-back from farmer through farmer to farmer.	Over 300 farmers around of core and on-farm will use the technology which are informed from SOFEM. - Above 19 technologies have been developed based on original plan (On-station) - Above 5 technologies have been verified through On-farm stations based on original plan (On-farm) - Above 13 technical reports or manuals have been made (On-station and On-farm)Accomplished as a plan - At the Social forestry Seminar, over 20 reports was presented by counterparts. - Over 5 technologies have been feed-backed and experimented.	
Output2 Appropriate methods of establishing farm forests and its extension are developed	By March 2001, about 60 farmers should take part in the process of farm forest establishment	More than 70% of the farmers should be satisfied with the extension methods in the above level 4 of 5 ranks evaluation in terms of; - Technical level - Cost- effectiveness etc. - More than 90% of the extension agents evaluate the suitability of the extension methods in the above level 4 of 5 ranks evaluation in terms of; - Technical level - System of implementation; - Select farmers and planting; 6 from 21 nominated farmers planting 11 SP 672 seedling in 98, 31 from 91 16 SP 2100 seedling in 99, 24 2100 seedling in 00, 15 in 01 by extension agent voluntary -Personal, group and village approach was corroborated -Periodical monitoring, training study tour, and farmer to farmer training was did - Cost share was corroborated - Demo II was approached over – persons.	
Output3 Appropriate methods of information dissemination for social forestry are developed Information on social forestry extension is shared by the people and other related organizations	Over ten information was interchanged between technical development and extention development, and farmers.	The following outcomes expected for farmers, extension agents and the others; - over 2,000 copies of technical manuals distribution - over 5,000 copies of the "News Letter" distribution - over 2,500 participants of mobile shows - over 150 participants of seminars - over 2,000 access to Home Page on web site during the period of Jan. 2002 to March 2002 - Over 10% of the farmers disseminate to other farmers the information they have received in some way	

Narrative Summary	Indicator	Result (2002.4)	Assumption
Activities 1. Develop practical technique for establishment of farm forests in semi-arid areas 1.1. Develop technology in the Pilot Forest 1.2. Verify practical technologies by on-farm experiments 1.3. Prepare technical manuals 2. Design, establish, monitor and evaluate farm forests, and build extension methods 2.1. Establish farm forest in SFTP (II) target area 2.2. Collect and analyze information concerning establishment of farm forest 2.3. Formulate strategic plan for promoting farm forest establishment by local residents 2.4. Establish farm forests 2.5. Establish farmer to farmer extension system 2.6. Improve demonstration plots in Tiva (DEMO II) 2.7. Feedback of technical knowledge of planting and tending into the technology development 2.8. Intermediate evaluation 2.9. Review of plan of farm forest establishment 2.10. Final evaluation and compilation of the results of the activities 3. Collect, synthesize and disseminate information on social forestry extension 3.1. Make preparations for information activities 3.2. Hold regular meetings 3.3. Collect and analyze of information from outside sources 3.4. Collect of information accumulated through project activities 3.5. Develop extension materials on establishment of farm forest for extension agents 3.6. Disseminate information through publications and events 3.7 Develop a social forestry extension model activity		Input by Japan Expert - Lon term; Some 17 in 6 section(Chief Adviser, coordinator, Technical Development, Establishment of Farm forest(Technique) , establishment of Farm forest(Extention0 and Extension method and Information) - Short term; Some 9(Forest resource survey(two), Tree water physiology (four), Forest management) Training - In Japan; 13 - Third country; 5(Thailand(Wid on village development), India(Agro forestry) Filipino(Proper Agro forestry Technology) Equipment Some; Operation budget Input by Kenya Counterpart Land Facilitation, office Operating budget	- Weather condition, such as rainfall, does not change drastically during the project - Cooperation By the farmers and related institutions are obtained Inputs form both sides are timely and adequately provided **Preconditions** - Outputs of former phases are utilized Residents' needs accord with the project purpose

III. Summery of evaluation

1. Efficiency

(1) Timing of Input <Japanese Side> - Expert Assignment - Procurement - Counterpart Training <Kenyan Side> - Land, Facility, Equipment - Counterpart Assignment - Local Cost	<Japanese side> - Basically 6 experts have been assigned all through the Project period and that has been appropriate number. The expert for information activities was not assigned for some months but it did not affect much on the progress. Short-term experts were also utilized according to the project progress and they contributed to the technical development. - Yearly operational costs for each fiscal year were; 1997: 7,700, 1998: 20,497, 1999: 21,232, 2000: 22,299, 2001: 31,549, 2002: 23,896 (plan), in 1,000 Yen. Although Japanese side has provided most part of running cost, which should have been shouldered by Kenyan side, it was an appropriate measure to operate the Project smoothly. - Yearly procurement costs were; 1998: 33,000, 1999: 8,666, 2000: 11,369, 2001: 9,348, 2002: 6,000 (plan), in 1,000 Yen. Mainly spare parts will be purchased on the last year to secure sustainability of the equipment use. Others are a vehicle, experimental equipments, PC, a generator, and books and they used to technology development and extension purposes. - As for counterparts training, 4 (1998)+ 3 (1999)+ 3 (2000)+ 3 (2001) =13 were sent to Japan, and 3 were sent to Thailand, India and Philippines. They were managers, division and section chiefs. It is evaluated that the training was highly effective as participants could learn valuable knowledge and techniques. <Kenyan Side> - In general, appropriate number of counterparts was assigned from KEFRI and FD since the beginning of the Project. - Inputs of SFTP (land, facility, equipment, etc.) have been used effectively. - Although Kenyan side could not secure the local cost, it did not hinder the project progress due to the financial support from Japanese side.
(2) Relationship between Input and Output (Quality & Quantity of Input and Output) <Japanese Side> - Expert Assignment - Procurement - Counterpart Training <Kenyan Side> - Land, Facility, Equipment - Counterpart Assignment - Local Cost	<Japanese Side> - 6 long-term experts were assigned for each field and generally they have achieved outputs as planned with technology transfer to their counterparts. Therefore the quality and number of Japanese experts were appropriate. - Short-term experts were assigned effectively and satisfied the project needs in quality and quantity. - It is evaluated that necessary equipments for project implementation were inputted in appropriate quantity but some PCs are old fashioned. - All participant of counterpart training has improved their knowledge, technology and responsibility, and appreciated the training because of its usefulness. Therefore counterpart training highly contributed the Project. <Kenyan Side> - Capable counterparts were secured, especially the ones since SFTP due to their willingness and technology absorption. Though there were reshuffling of personnel and absence of counterparts due to vacation, that did not influenced project progress much. - Information activities were hindered because of the dispersion of stations at FD, KEFRI Muguga and Kitui, inadequate communication measures among them, and communication gap between FD and KEFRI when they belonged to the different Ministries. But the situation was improved after 2 institutions affiliated with MENR and infrastructures were rearranged. - Both KEFRI and FD could not secure the enough budgets to operate the Project, and depended on the input from Japanese side. Especially it was difficult for FD to create outer financial source and counterpart budget for the project was not provided at the initial stage of the Project. But its budget has been provided since last year so steady financial support would be expected.
(3) Linkage with Other Projects/ Agencies	- SFTP had been implemented for more than 10 years. It made a foundation for the Project and contributes in many aspects. - Information exchange with other JICA projects/ experts, international agencies such as ICRAF, Israel, Belgium contributes effective information use and dissemination.
(4) Others	- As there are 2 implementing institutes dispersing 3 stations, efficiency of internal communication has been relatively low. Especially in information

	activities, that affected smooth technical transfer from a Japanese expert to counterparts, but it was eased as explained on (2).

2. Effectiveness

(1) Contribution of outputs to project purpose achievement	Accomplishment	Obstruction
Output1 Practical techniques for planting and tending trees for establishment of farm forest are provided	The Project has developed basic silviculture technology for farm forestry on Semi-arid area, which is been used and has been confirmed by over 76 farmers. Over 19 basic technologies were developed on station, and over 5 technologies were confirmed on farm. Over 13 technical manuals were published. The technologies are provide through the Farmer to Farmer method by silvicultural guideline, as a basic of social forestry model, in this meaning this output contribute directly to the project purpose, "A social forestry extension model for semi-arid areas is developed through establishment of farm forest by local residents".	No
Output2 Appropriate methods of establishing farm forests and its extension are developed	Over 70 farmers contributed to establishment of farm forestry and the Farmer to Farmer extension under the instruction of SOFEM. Over 70 % of farmers appreciated the silvicuture and extension technology. The neighbor farmers also have a willing of contribution to farm forestry. The extension technology was build up through farm forest establishment base on the technical development and farmer needs, and this out put is used farm forest management guideline as a basic of social forestry model, in this meaning this output contribute directly to the project purpose.	No
Output3 Information on social forestry extension is shared by the people and other related organizations	Exchange of between farmer and SOFEM and among Administration and stakeholders has been progressed and feedback system is developing through farmer to farmer and extension agent. Information was distributed like manual (20000), news letter (5000). In this meaning this output contribute directly to "Project Purpose, "A social forestry extension model for semi-arid areas is developed through establishment of farm forest by local residents".	No
(2) Contribution of activity to implementation of project out put	Accomplishment	Obstruction
Activity 1. Develop practical technique for establishment of farm forests in semi-arid areas	The technology developed on station is tried on farm. This output of trial is distributed by manual and examines practicality. The forests on farm has function of demonstration of stable forestry, and sorouding farmers is starting tree plantation. The assumtiopn like livestock harm, Tarmaite, Root rott was lead newu technology like Intercropping, Fodder tree. These practical technogy development get at output 1 directly.	
Activity 2. Design, establish, monitor and evaluate farm forests, and build extension methods	Farmers established farm forests, the extension methods like "Farmer to Farmer" have been tested, and surrounding farmers have participated the project through the cost sharing system. TA planned and supervised the establishment of farm forests. Farmers' interests were maximized on farm forests establishment since beginning. TA also supervised farmer's selection by his own idea. Through these practices, Activity 2 contributes the Output 2 directly.	FD's budget lack has constrained TA's extension activities.

Activity 3. Collect, synthesize and disseminate information on social forestry extension	Necessary information for Activity 2 were collected and arranged. Extension materials for farmers and TA were made, and they were distributed and disseminated through various media. Publicity was done on social forestry to enhance understanding and publication means for researchers were also provided. These disseminations are done through various means according to targets and information is shared with receivers. Therefore Activity 3 contributes the achievement of Output 3 in various aspects.	No

3. Relevance

(1) Relevance of Overall Goal - Consistency with beneficiary needs - Constancy with development policy	- The project purpose would be achieved by the end of the project because all of outputs would have been achieved and all indicators would be accomplished by then. - Output 1 would be achieved, as planned number of technological outcomes has been developed through the pilot farm experiments. - High satisfaction of farmers and extension agents learned though their experience shows the high achievement of farm forest establishment methods developed through practices in the field (Output 2). - Output 3 would be also evaluated as satisfactory due to the on-time progress of activities and accomplishment of indicators. All outputs are necessary component for the social forestry extension model. - As a result of the achievements noted above, the indicators for the project purpose, "By March 2002, sustainable extension methods should be developed." And "By March 2002, over 300 farm forest should be established." Would be accomplished.
(2) Relevance of Project Purpose - Consistency with Overall Goal - Constancy with the needs of implementing agencies	- Once the applicable model is developed for ASALs, it is expected that residents outside the target area use it and the overall goal will be achieved basing on the achievement of the project purpose. But a steady extension activity is necessary for the achievement of the overall goal. - Both FD and KEFRI recognize that the forestry technology and extension in ASALs are very important issue. Forestry policy designates that farm forest establishment should be initiated by residents, so both institutions are interested in the extension model development through farm forest establishment by residents. Therefore the project purpose accords with the needs of implementing institutes. - Farmers in the target area recognize that farm forest establishment contributes the creation of daily commodities and income generation, soil moisture increase and soil conservation. There is a high demand for tree planting among residents. Therefore the project purpose accords with the needs of beneficiaries.
(3) Relevance of Project Plan in Relationships among Overall Goal, Project Purpose, Outputs and Inputs	- The achievement of the overall goal requires the achievement of the project purpose and long-term steady extension activities in vast areas, so there is a gap in between. - Activity 1 has developed applicable technologies to achieve Output1, Activity 2 implements and verifies farm forest establishment, and Activity 3 collects and disseminates information concerned with social forestry including farm forest extension. The structure is planned appropriately. - The weight of the Project has been shifted, from basic experiments at the pilot forest to verification study at on-farm and farm forest establishment by farmers. That defined the flow of technology development and extension effectively.
(4) Irrelevant Factors (Beneficiaries' needs, Project Planning, Implementing Structures, Japanese Support Structures, etc.)	- Although the mid-term evaluation report says that the lack of local cost from Kenyan side is irrelevant and does not accord with the precondition "Inputs form both sides are timely and adequately provided", that did not hinder project progress due to the efforts of Kenyan and Japanese sides. But the relevance of project planning is questioned. - FD's involvement into the Project and budgetary provision were inadequate especially at the initial stage. But the harsh situation has been improved, as the importance of the Project participation has been understood. - As detailed PO sometimes constrained the flexible correspondences, there was not enough time especially for feedback and many things were left on Kenyan

	side. Although that is not a problem because KEFRI will be in charge for them, the system for easier revision of PO should have been institutionalized.
(5) Others (Consistency with Japanese aid policy)	- This project accord with the Japanese aid policy, which emphasizes sustainable development and environmental conservation.

4. Impact

(1) Direct Impact (Project Purpose Level)	- Through the information dissemination activities and seminars, local residents in the target area and extension agents in and out of the target area could learn what was the idea of social forestry, and the information was shared with researchers of other institutes. - Some residents started managing commercial forestry. - Activities like improved kitchen stoves and small scale nurseries improved women's participation for social forestry. - KEFRI found a way to get self help financial sources such as training courses, consultancy services, seed/ seedling sales and facility rental, and established its important position as a central research institute for social forestry in the East Africa.
(2) Indirect Impact (Over all goal Level)	- A new project is planned to alleviate poverty through the social forestry. - The overall goal will be achieved not within 5 years but in the long run if there is no drastic change of important assumptions and FD's extension function is strengthened. The gap between the overall goal and project purpose appears rather big, and so far there seems to be no achievement in the overall goal. - Trees for social forestry produce economical profits, which encourage residents' incentives for afforestation and upgrading of their daily life. - Although the social forestry is not noted on the discussed forestry act, the idea is included in some committees. It is expected that the social forestry appears on legislative articles. - Shifting cultivation and local forestry industry will be also improved in the long run and that influence natural environment and living standard of local people. - Economical effect of commercial forest establishment, efficient firewood use and their extension in ASALs is high, and effects of poverty alleviation and financial increase are also expected.
(3) Others	No

5. Sustainability

(1) Administrative Aspect (Policy, Staff Assignment, Collaboration with Other institutes, Management Capacity)	- As both the overall goal and project purpose accord with Kenyan forestry policy, it is expected that KEFRI and FD will receive political supports from the Kenyan government due to impeding circumstances of forest shrinkage and environment deterioration. - Through the structural change of the government on September 1999, both KEFRI and FD were under the umbrella of MENR. That mattterialized a strong tie between them and the basic structure of social forestry extension model would be maintained from technology development to extension with feedback from the field. - KEFRI has enough capacity to manage the Project and it is expected that KEFRI will continue experiments after the Project. And KEFRI has established its important position as a central research institute for social forestry in the East Africa. - Although FD does not have enough budget for the farm forestry extension at present, the awareness of the importance of natural environmental conservation will be the follow wind for the financial support to FD. But materialization of social forestry extension requires more legislative support. - All equipments will be utilized although service period of many of them have expired so spare parts will be provided at the end of the project. Their condition should be followed in the appropriate timing.
(2) Financial Aspect (Financial Source, Public Subsidy, Self-reliance Finance, etc.)	- Although Kenyan side has made an effort to provide operational cost, it is difficult to withdraw budgets due to financial constraints of the government. Improvement like the change of Forestry Act is on going but financial sustainability is one of most endangered aspect. - KEFRI has started the management of self-reliance financial sources such as training courses, consultancy services, seed/ seedling sales and facility rental. Those are expected to sustain the future activities. - In case of FD, it is difficult to create outer financial sources since FD is governmental institute, and beneficiaries, mainly farmers, can not shoulder material costs either. Finance increase of FD depends on the arrangement of legislative support. - Through the cost sharing extension method, it was found that initial cost provision for farmers should be considered although beneficiaries should shoulder it. - Interests of farm forest establishment has become higher and higher among farmers in and around the target area as income is generated through farm forest. Therefore sustainability of farm forest establishment is quite high.
(3) Technical Aspect (Technical Transfer, Equipment Maintenance, Technical Needs)	- Farmers outside target area would accept the developed techniques through the establishment of demonstration forest on each area because they also interested in practical and profitable technologies. - Counterparts have learned technologies steadily and TAs also learned enough techniques under the close supervision of KEFRI counterparts. It shows that technical transfer has been successfully completed and technical capacity of staffs has been improved. - The period of durability of donated equipment and machines has been over, so they need follow up.
(4) Others	No

IV. Conclusion and Recommendation

1. Conclusion	The relevance of the project is evaluated generally appropriate in terms of national policy and residents' needs. While the forest area has been rapidly decreased and deteriorated in the arid and semi-arid area, occupying more than 80 % of the national land, Kenyan government emphasizes afforestation from the environmental and industrial point of views, and the community based social forestry is one of the priorities in the forestry act being revised. Therefore the project is quite relevant to the national policy. Local residents expect the effect of social forestry in order to secure wooden resource for firewood, cattle feed and fruits, and to obtain cash income from sales of timber, charcoal, etc. And they know that forests are very important for soil conservation. The structure of the project was basically reasonable because the emphasis were sifted from technical development through in-field verification to dissemination activities. The changes of PDM and PO were also effective. Although the financial constraints of FD had been known, it is regrettable that any drastic countermeasures were not taken. And some project staff raised the inflexibility for the change of PDM and PO. From results of project's accomplishment and evaluation based on five criteria, it is evaluated that effectiveness is quite successful while efficiency, impact and relevance are fair, and sustainability has an inevitable obstacle. As the planned targets will be accomplished by the end of the project, the project will be terminated as scheduled. The progress of the project is on schedule and the project purpose and outputs will be achieved by the end of the project except for some experiments, which will be completed by KEFRI counterparts. Though the output of information dissemination activities was not clear due to the vagueness of target group, efficiency, especially in the said field, will be improved after refocusing of the target. It is evaluated that most impacts are positive especially to the implementing agencies and beneficiaries but there seems a long way to go to the overall goal from the present situation. The project purpose and overall goal accords with the national policy and residents' needs, while no countermeasures were taken for the financial constraints of FD. The financial constraints of the Kenyan government affect sustainability of the dissemination of a developed social forestry extension model.
2. Recommendation	(1) The target group should be made clear for the whole project and each information dissemination activity in order to measure the accomplishment of outputs appropriately. (2) Each field should produce a final report before the end of the project to finalize all the outputs and arrange them in a useful manner. Results of remaining experiments being carried out by KEFRI should be followed up and arranged the same. (3) The structure for the social forestry extension after the project should be considered concretely by the end of the project. Developed techniques should be compiled focusing on it. (4) The integrated model for social forestry extension should be finalized in a useful and understandable manner for extension agents and farmers. (5) Considering the endangered sustainability for social forestry extension due to the financial constraints of Kenyan government, a new project should be examined. Its status is planned as followings. 1) The overall goal should contribute to poverty alleviation. 2) The project purpose should promote both community level and individual level forestries through an organization such as the planned regional forest committee. 3) Project components shall be improvement/ development of industrial forestry technology and community development planning techniques, training for extension agents, and capacity improvement of information dissemination in Forestry Service. 4) The main counterpart is Forestry Service or Forestry Department, although

	close cooperation is necessary with KEFRI and other institutes, and agricultural development agencies as participation of a steering committee, etc. 5) Project office is stationed in Forestry Service or Forestry Department. 6) The project should have a function to propose political suggestion to the headquarter of FD. 7) Co-operating scheme like development survey and grant aide will be examined in same time. (6) Considering the enhancement of East Africa Forest conservation, Forestry Development and rural development through forest product industry and sustainable use of land, and the status of Kenya in these field, continues relationship should be build up based on series of projects and all of cooperation scheme should be considered. (7) It is very needed to prepare spear parts of equipment by the end of the project and follow up at adequate timing.
3. Lessons learned	(ア) PO prescribes details firmly but indicators in PDM were vague, so it was difficult for each expert to take appropriate measures corresponding to each process and result of activities. That delayed response to some techniques and methods, which might have been valuable, and some of them could not be verified due to time constraints. Therefore the PDM and PO should have flexible expressions, varieties of menu or a system to change their contents flexibly. (イ) A project should have a function to propose political suggestion to the top of implementing agencies in order to achieve the overall goal smoothly. (ウ) It was confirmed that forestry technology is transferred direct approach to farmer and management base demonstration is effectible way for expansion of forestry.

PDMe (Draft)

5th Apr. 2002 Final Evaluation Team

Project Name : The Social Forestry Extension Model Development Project for Semi-arid Areas in Kenya
Duration : 1997 Nov. 26 to 2002 Nob.25 (5 years)
Target Area : 4 Divisions (Kabati, Central, Chuluni, Mutomo) in Kitui District in Eastern Province
Target Group : Farmers involved with the Project in the Target Area

Narrative Summary	Indicators	Means of Verification	Important Assumptions
Overall Goal The inhabitants of semi-arid areas in Kenya are equipped with appropriate techniques to plant trees and management of them.	Number of inhabitants who adopted more appropriate method of social forestry extension in semi-arid areas	- Information from FD and KEFRI - Policy document of the government of Kenya	Government policy to promote farm forestry does not change in the long run.
Project Purpose A social forestry extension model for semi-arid areas is developed through establishment of farm forest by local residents.	- By March 2002, sustainable extension methods would have been developed. - By March 2002, over 300 farm forest would have been established.	Project document, FD and KEFRI document	- Need for tree products, social forestry techniques and extension services by farmers do not change. - Weather condition, such as rainfall, does not change drastically. - Adequate number of extension agents and their operation fund are timely provided.
Output1 Practical techniques for planting and tending trees for establishment of farm forest are provided.	- By March 2002, above 19 technologies would have been developed based on original plan (On-station). - By March 2002, above 5 technologies would have been verified through On-farm stations based on original plan (On-farm). - By March 2002, above 13 technical reports or manuals would have been made (On-station and On-farm).	- Project documents, FD and KEFRI document - Technical reports and manuals - Conducting interview with the Project staff of KEFRI and FD	Trained staffs and farmers continue to work on farm forests and its extension.
Output2 Appropriate methods of establishing farm forests and its extension are developed.	- By March 2001, about 60 farmers shall take part in the process of farm forest establishment. - As of March 2002, more than 70% of the farmers would have been satisfied with the extension methods in the above level 4 of 5 ranks evaluation in terms of; * Technical level * Cost- effectiveness etc. - As of March 2002, more than 90% of the extension agents evaluate the suitability of the extension methods in the above level 4 of 5 ranks evaluation in terms of; * Technical level * System of implementation etc.	- Project documents, FD and KEFRI document - Conducting interview with the Project staff of KEFRI and FD - Organizing workshop and conducting interview with the farmers - Organizing workshop and conducting interview with the extension agents	
Output3 Information on social forestry extension is shared by the people and other related organizations.	- By March 2002, the following outcomes would have been expected for farmers, extension agents and the others; * over 5,000 copies of the "News Letter" distribution * over 7,000 participants of mobile shows - As of March 2002, over 50% of the people who have received the above information utilize it. - As of March 2002, over 50% of the farmers disseminate the information they have received to others in some way.	- Project documents - FD and KEFRI document - Questionnaire to participants (sample survey)	
Activities 1. Develop practical technique for establishment of farm forests in semi-arid areas 1.1. Develop technology in the Pilot Forest 1.2. Verify practical technologies by on-farm experiments 1.3. Prepare technical manuals 2. Design, establish, monitor and evaluate farm forests, and build extension methods 2.1. Establish farm forest in SFTP (II) target area 2.2. Collect and analyze information concerning establishment of farm forest 2.3. Formulate strategic plan for promoting farm forest establishment by local residents 2.4. Establish farm forests 2.5. Establish farmer to farmer extension system 2.6. Improve demonstration plots in Tiva (DEMO II) 2.7. Feedback of technical knowledge of planting and tending into the technology development 2.8. Intermediate evaluation 2.9. Review of plan of farm forest establishment 2.10. Final evaluation and compilation of the results of the activities 3. Collect, synthesize and disseminate information on social forestry extension 3.1. Make preparations for information activities 3.2. Hold regular meetings 3.3. Collect and analyze of information from outside sources 3.4. Collection of information accumulated through project activities 3.5. Develop extension materials on establishment of farm forest for extension agents 3.6. Disseminate information through publications and events 3.7 Develop a social forestry extension model	Inputs Japanese Side 1. Experts 6 long-term experts in the following fields - Chief Advisor - Coordinator - Technology Development - Farm Forest Establishment (technology) - Farm Forest Establishment (extension) - Extension method and information 2 - 3 short-term experts per year 2. Training in Japan 2 - 3 counterparts per year 3. Equipment 4. Sharing of running expenses - for plantation - for extension	Kenyan Side 1. Counterparts and staff - Project Director - Project Manager - Project Coordinator - Counterparts PF Manager Extension Manager Forest Ext. Officer Information Officer - Administrative staff Clerks Drivers & Laborers Other supporting staff 2. Land & buildings 3. Running expenses for the implementation of the project	- Weather condition, such as rainfall, does not change drastically during the project. - Cooperation By the farmers and related institutions are obtained. - Inputs form both sides are timely and adequately provided. **Preconditions** - Outputs of former phases are utilized. - Residents' needs accord with the project purpose.

Revised plan of operations for activitiy 1 (June 2001)

Output (1) : Practical techniques for planting and tending trees for establishment of farm forest are provided.

(3rd Revised, June 2001)

Activities	Targets/Indicators	Schedule	Responsible persons in the project	Inputs	Remarks
		1998 I II III IV / 1999 I II III IV / 2000 I II III IV / 2001 I II III IV / 2002 I II III IV			
1.Develop practical technique for establishment of farm forest in semi-arid areas					
1. 1 Develop technology in the Pilot Forest					
1.1.1 Development of basic tree planting technologies					
1.1.1.1 Seeds germination	Melia volkensii, Terminalia brownii		Muok,Kyalo,Okamoto	labour,consumable,fuel,tools	
1.1.1.2 Root system	root pattern and drought tolerant		Kyalo,Muok,Okamoto	labour,consumable,fuel,tools	
1.1.1.3 Insect/disease control	Degree of damage comparison		Kyalo,Muok,Okamoto	labour,consumable	
1.1.1.4 Response to challenges in on-farm and extension	Mulching and Intercropping experiments		Auka,Muok,Mihara	labour,consumable,fuel,tools,seed	
	Establish plot on melia planting methods		Auka,Muok,Mihara	labour,consumable,fuel,tools	
	Soil map of pilot forest		Jacinta,Kyalo,soil technician,Auka,Muok,Mihara,Okamoto	labour,consumable,short term expert	new activity
1.1.2 Verification of intensive planting management					
1.1.2.1 Water catchment	optimum type, size/growth, erosion		Auka,Muok,Mihara	labour	
1.1.2.2 Mulching	necessity of mulching/ growth		Auka,Muok,Mihara	labour	
1.1.2.3 Weeding	optimum frequency/growth, survival		Auka,Muok,Mihara	labour	
	clear weeding, slash/growth, survival		Auka,Muok,Mihara	labour	
1.1.2.4 Water regime					
1.1.2.4.1 Soil moisture	1ha/treatment-soil moisture relations/growth		Auka,Muok,Mihara	labour,machine,fuel,seeding,short term expert	
1.1.2.4.2 Sun heat shield effect and mulching	0.3ha/effect of mulching/growth		Auka,Muok,Mihara	labour,machine,fuel,seeding,short term expert	
1.1.2.4.3 Water stress	pruning-water stress relations/correlation		Auka,Muok,Mihara	labour,machine,fuel,seeding,short term expert	
1.1.2.4.4 Evapo-transpiration	water consumption/sap flow		Auka,Muok,Mihara	labour,machine,fuel,seeding,short term expert	
1.1.3. Verification of planting technology					
1.1.3.1 Monitoring of existing spacing plot	optimum spacing/growth, survival		Auka,Muok,Mihara	labour,consumable	
1.1.3.2 Study pruning of existing plot	effect of pruning/growth, survival		Auka,Muok,Mihara	labour,consumable	
1.1.3.3 Study thinning of existing plot	effect of thinning/growth, die-back		Auka,Muok,Mihara	labour,consumable	
1.1.3.4 Study coppicing of existing plot	coppicing ability /no. of coppices		Auka,Muok,Mihara	labour,consumable	
1.1.4 Establishment of Wildfruits demonstration orchard	trials on 20 spp./growth, marketability using grafting, cutting and mycorrhiza		Auka,Muok,Kyalo,Mihara Okamoto	labour,machine,fuel,seeding,consumable	
1.1.5 Suporting activity of technology development					
1.1.5.1 Weather monitoring data	weather data		Kyalo,Auka,Muok,Okamoto,Mihara	labour,tools,monitoring	
1.1.5.2 Collection of references	references/no. of references		Auka,Kyalo,Mihara,Okamoto	labour,machine,fuel,consumable	
1.1.5.3 Management of experimental plot and road network	road management, experimental plot management		Auka,Muok,Mihara	labour,machine,fuel,consumable	
1.1.5.4 Seed collection, production and supply of seedling	necessary no. /no. of seedlings		Kyalo,Okamoto	labour,fuel,seed,purchsse,tools,material	production of seedling continued
	necessary weight/ weight of seed collected				
1.1.5.5 Management of Tiva arboretum	no. of spp./weight of seed supplied		Kyalo,Okamoto	labour,consumable,fuel,tools	completed
1.1.5.6 Protection of human and animal damage	1000 ha./ decrease of damage/ number of damages		Auka,Kyalo,Mihara,Okamoto	equipment,fuel,labour,consumable	
1.1.5.7 Study on cost analysis	work efficiency table/table		Auka,Kyalo,Muok,Mihara,Okamoto	labour,consumable	

Note :1.1st quarter is January to March, 2nd quarter is April to June, 3rd quarter is July to September and 4th quarter is October to December.
The project commenced on 26th November 1997.
2. First name in the row is the sctivity leader.

Revised plan of operations for activity 1 (June 2001))

Output (1) : Practical techniques for planting and tending trees for establishment of farm forest are provided.

(3rd Revised, June 2001)

Activities	Targets/Indicators	Schedule 1998 I II III IV	1999 I II III IV	2000 I II III IV	2001 I II III IV	2002 I II III IV	Responsible persons in the project	Input	Remarks
1.2 Verify practical technologies by on-farm experiments									
1.2.1 Farmers selection									
1.2.1.1 Collection of physical and weather condition data.	stratification of area/map						Kyalo,Muok,Okamoto	vehicle, fuel, tools	
1.2.1.2 Selection of representative farmers	No. of selected farmers						Kyalo,Muok,Okamoto	vehicle, fuel, tools, stationary	
1.2.1.3 Technology workshop for selected farmers	No. of workshops						Kyalo,Muok,Okamoto	vehicle, fuel, tools, stationary	
1.2.2 Verification of the technologies developed in the pilot forest									
1.2.2.1 Water harvesting (Micro-catchment)	Appropriate structure/type of structure						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.2.2 Site preparation	Appropriare method/no. of method						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.2.3 Hole size	Optimum size/no.of hole sizes						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.2.4 Weeding (complete, slashing, spot)	Weeding method/growth and survival						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.2.5 Prunning	Optimum prunning height/diferrent prunning level						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.2.6 Experiments to respond to feedback from farm forest	Number of technology retested						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	New activity
1.2.3 Introduction of new technology	Same farmers in 1.2.1								
1.2.3.1 Fruit trees	Adaptability/ farmer acceptance						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.3.2 Fodder	Adaptability/ management						Kyalo,Muok,Okamoto	labour, consumable, fuel, tools, vehicle, seedings	
1.2.4 Weather Monitoring and soil sampling	1 rain gauge per selected farmer sample soil on each selected farm						Kyalo,Muok,Adhaya,Okamoto	monitoring tools, labour, fuel soil collection tools, soil analysis equipment	
1.3 Prepare technical manuals									
1.3.1 Data collection and management	Collect, summarize and file data from all exp. plots and some farm forest						Muok,Kyalo,Auka, Segawa,Okamoto,Mihara	transportation, stationary, labour computer	
1.3.2 Data analysis	All collected data						Muok,Kyalo,Auka, Segawa,Okamoto,Mihara	stationary	
1.3.3 Preparation of manuals	Draft and prepare manual for publication/ 3 manuals.						Muok,Kyalo,Auka Segawa,Okamoto,Mihara	stationary	

Note : 1.1st quarter is January to March, 2nd quarter is April to June, 3rd quarter is July to September and 4th quarter is October to December.
The project commenced on 26th November 1997.
2. First name in the row is the activity leader.

Reviced plan of operations for activity 2 (June 2001)

Output (2) : Appropriate methods of establishing farm forests are developed

(3rd Reviced, June 2001)

Activities	Targets/Indicators	Schedule 1998 I	II	III	IV	1999 I	II	III	IV	2000 I	II	III	IV	2001 I	II	III	IV	2002 I	II	III	IV	Responsible persons in the project	Inputs	Remarks
2 Design, establish, monitor and evaluate farm forest																								
2.1 Establish farm forests in SFTP (II) target area																								
2.1.1 Select target farmers	Number of selected target farmers																					Ali, Emily,DFEOs,Yamauchi	transport, stationery, allowance, labour	
2.1.2 Conduct profile survey on selected targets	Number of target farm profiles																					Ali, Emily, DFEOs, Hiro	transport, stationery, allowance, labour	
2.1.3 Design target farm forests	Number of designed farm forests																					Muok,Kyalo,DFEOs, Hayashi, Hiro,Yamauchi	transport, stationery, allowance, labour	
2.1.4 Establish farm forests	Number of established farm forests																					Ali, Emily,Kyalo,DFEOs, Hiro,Hayashi	transport, stationery, allowance, labour, seedling.	
2.1.5 Monitor the establishment of farm forests	Number of times monitored / reports																					DFEOs,Ali,Emily,Muok,Kyalo,Osore Shimada, Okamoto	transport, stationery, allowance, labour	
2.1.6 Record keeping	Number of records																					DFEOs, Ali, Emily, Muok, Kyalo Shimada, Okamoto	Stationery.	
2.2 Collect and analyze information concerning establishment of farm forest																								
2.2.1 Review of SFTP (II) extension approaches	Crucial points for tree planting by farmers report																					Emily, Ali, Rateng,Yamauchi	Stationery	
2.2.2 Conduct general conditions survey in target areas	General conditions report of the target areas																					Muok, Ali,Emily Yamauchi, Hayashi	transport, stationery, consultancy	
2.2.3 Conduct forest resource survey	Forest resource inventory report																					Muok,Segawa, Okamoto	Survey instrument, transport,Short term expert	
2.2.4 Conduct survey for general condition of individual farmers in target areas	Criteria for selecting target farmers/ Socio-economic survey report																					Muok, Kamene,DFEOs, Hiro	transport consultancy	
2.3 Formulate strategic plan for promoting farm forest establishment by local residents																								
2.3.1 Set up guideline for farm forest establishment	Guideline for farm forest establishment																					Nyambati, Muok, other team members. Hiro	Stationery	
2.3.2 Identify appropriate approach for target farmer selection	SOFEM's approach for farmer selection (Village app, Group app and Individual app)																					Ali, Emily, DFEOs, Hiro	Stationery	
2.3.3 Select target areas	Number of target areas																					All team members	Stationery	
2.3.4 Conduct and monitor seeds/seedlings information syster	No. of people shared seed/seedling information																					Ali, DFEOs,Emily Shimada	Stationery	
2.3.5 Conduct and monitor cost sharing system	Number of local residents participated																					Emily, DFEOs, Shimada	Stationery	

Note : 1. 1st quarter is January to March, 2nd quarter is April to June, 3rd quarter is July to September and 4th quarter is October to December. The project commenced on 26th November 1997.

2. First name in the row is the Activity Leader

Reviced plan of operations for activity 2 (June 2001)

Output (2) : Appropriate methods of establishing farm forests are developed

(3rd Reviced, June 2001)

Activities	Targets/Indicators	Schedule	Responsible persons in the project	Inputs	Remarks
		1998 I II III IV / 1999 I II III IV / 2000 I II III IV / 2001 I II III IV / 2002 I II III IV			
2.4 Establish farm forests					
2.4.1 Train extension agents					
2.4.1.1 Implement training courses	Number of TAs trained		Kamene,Rateng,DFEOs, Nyambati, Osore, Hiro, Yamauchi, Hayashi	training expenses	
2.4.1.2 Implement OJT through establishment of farm forests	Number of TAs trained		DFEOs,Ali,Emily, Kimiti,Osore Shimada, Okamoto	bicycles, motorbike	
2.4.2 Select target farmers	Number of selected target farmers		DFEOs,Ali,Emily,Kimiti,Osore Shimada,Okamoto,	transport, stationery	
2.4.3 Train target farmers	Number of target farmers trained		DFEOs, Kimiti, Osore, Shimada, Okamoto	training expenses	
2.4.4 Conduct profile survey on selected targets	Number of target farm profiles		DFEOs,Ali,Emily,Kimiti,Osore, Shimada	transport, stationery, allowance	
2.4.5. Design target farm forests	Number of designed farm forests		DFEOs,Ali,Emily,Kimiti,Osore Shimada	transport, stationery, allowance	
2.4.6 Establish farm forests	Number of established farm forests		DFEOs,Ali,Emily,Kimiti,Osore, Shimada	transport, seedlings, labour,	
2.4.7 Monitor the establishment of farm forests	Number of times monitored / reports		DFEOs,Ali,Emily,Kimiti,Osore, Shimada	transport, allowance	
2.4.8 Record keeping	Number of records		DFEOs,Ali,Emily,Kimiti,Osore,	stationery	
2.5 Establish farmer to farmer extension system					
2.5.1 Prepare programme for farmer to farmer extension	Concept paper		Ali, DFEOs Hiro	stationery	
2.5.2 Conduct and monitor farmer to farmer extension programme	Number of farmers trained		Ali, Emily, DFEOs, Osore Shimada	transport, stationery, allowance	
2.6 Improve demonstration plots in Tiva (DEMO II)					
2.6.1 Develop and demonstrate practical farm forestry related technologies	Number of technologies demonstrated		Osore, Kimiti, other team member Shimada	Labour, seeds & Seedlings, tools	
2.6.2 Conduct and monitor OJT programme	Number of people trained		Osore,Kimiti, other team member Shimada	transport, stationery, allowance	
2.7 Feedback of technical knowledge of planting and tending into the technology development	Report including identified gaps		Kimiti, Ali,Emily,Osore Shimada	stationery	
2.8 Mid-term evaluation	Mid-term evaluation report		Muok, Nyambati Hiro,Yamauchi,Hayashi	transport, stationery, allowance	
2.9 Review of plan of farm forest establishment	Revised plan		Muok, Nyambati Hiro,Yamauchi,Hayashi	stationery	
2.10 Final evaluation and compilation of the result of the activities	Final evaluation report		Muok,Kimiti Shimada,Okamoto	transport, stationery	

Note : 1. 1st quarter is January to March, 2nd quarter April to June, 3rd quarter July to September and 4th quarter October to December. The project commenced on 26th November 1997.

2. First name in the row is the Activity Leader

Reviced plan of operations for activity 3 (June 2001)

Output (3): Information on social forestry extension is shared by the people and other related organizations

(3rd Reviced, June 2001)

Activities	Targets/Indicators	Schedule	Responsible persons in the project	Inputs	Remarks
		1998 I II III IV / 1999 I II III IV / 2000 I II III IV / 2001 I II III IV / 2002 I II III IV			
3. Collect,synthesize and disseminate of information on Social forestry extension					
3.1 Make preparations for information activities					
3.1.1 Clarify information flow on social forestry extension	Report on information flow		Ngatia,Barasa	Stationery, Transport	
3.1.2 Preparation of guideline for information activities	Information management guideline		Owuor,Ngige, Segawa	Stationery, Transport	
3.2 Hold regular meetings	Number of meetings held		Mbaya, Owuor, Ngige	Transport,Stationery,allowance	
3.3 Collect and analyze information from outside sources					
3.3.1 Collect publications and make catalogue	Number of abstracts from publication		Kimiti, Baraza, Mbiru, Shimada	Cost of purchasing publications, computers transport,room/cabinets	
3.3.2 Exchange information with concerned institutions	Report of information exchanged		Mwamburi, Shimada	Computer,transport stationery,E-mail/internet	
3.3.3 Collect and analyze successful cases of established farm forests	Number of case studies		Kimiti, Kamene	Transport,stationery	
3.4 Collection of information accumulated through project activities					
3.4.1 Keep record of project activities	Number of reports on project activities		Mwamburi,DFO,DFEO, Ioki	Stationery	
3.4.2 Collect information from farmers or extension agents	Number of farmer/ extension agents contacted		Mwamburi, DFEO, Shimada	Stationery	
3.5 Develop extension materials for extension agents	Number of extension materials developed		Ngige, Mbiru, Mwamburi, Shimizu	Computer Stationery	
3.6 Disseminate information through publications and events					
3.6.1 Publish project newsletter	Number of newsletters		Barasa, Mbiru, Ioki	Computer,stationery	
3.6.2 Disseminate information through other media	Number of articles published/documentaries compiled		Mbiru, Ngige, Baraza	Stationer, mailing cost	
3.6.3 Hold seminar on social forestry	Number of seminars held Number of papers presented		Mukolwe, Owuor, Mwamburi, Ngige, Shimizu, Ioki	Seminar expenses AV equipment	
3.6.4 Implement mobile show	Number of shows Number of attendance		Mwamburi, DFEO, Shimada	vehicle,travel cost stationery	
3.7 Development Extension Motel			Mbaya, Mukolwe, Kimondo, Segawa, Shimizu	Transport, Stationary, allowance	New P.O.

Note: 1st quarter is January to March, 2nd quarter is April to June, 3rd quarter is July to September and 4th quarter is October to December.

The project commenced on 26th November 1997

Status and Prospects of Sustainable Forestry Extension in ASALs:

Way Forward for Sustainable Extension in Kenya

Final Extension Task Force Report

SOCIAL FORESTRY EXTENSION MODEL DEVELOPMENT PROJECT

(SOFEM)

March 2002

Table of Content 2

NOTE: Above document underlined are omitted in this version

1 Introduction

1.1 Background Information

The origins of the Extension Task Force (ETF) can be traced to meetings held between the Project Team and the Chief Conservator of Forests (CCF) on 10 June 2001, which had been preceded by two brainstorming sessions on 23 May 2001 and 15 June 2001. It was felt that as the project period for the Social Forestry Extension Model Development Project (SOFEM) draws to an end, it was necessary that the future of the extension activities initiated by the project and the putting together of the model should be looked into as a handing over strategy.

ETF was thus constituted to look into the issues pertaining to forestry extension not only in Kitui but also in other areas. The SOFEM Project Implementation Committee (PIC) with the approval of the Joint Steering Committee (JSC) drew the terms of reference (Mandate) for the ETF as follows:

1. Identify and evaluate strengths and weaknesses of past and present forestry extension process in Kenya.
2. Identify opportunities for extension process development in Kenya.
3. Identify stakeholders, their roles and responsibilities in the extension process.
4. Propose options for appropriate extension process that are community driven and self-sustaining.
5. Review and recommend a framework for the Social forestry extension model.
6. Other relevant issues/policy recommendations.

In order to identify the forestry extension activities in the ASALs, ETF developed and conducted an information gathering survey in both public and private institutions. Questionnaires were administered to 25 different institutions. This report, presents the responses, opportunities and recommends/suggests potential action plan(s) for consideration. ETF acknowledges input from the short-term expert s, assistance in the compiling the first Draft Interim Report.

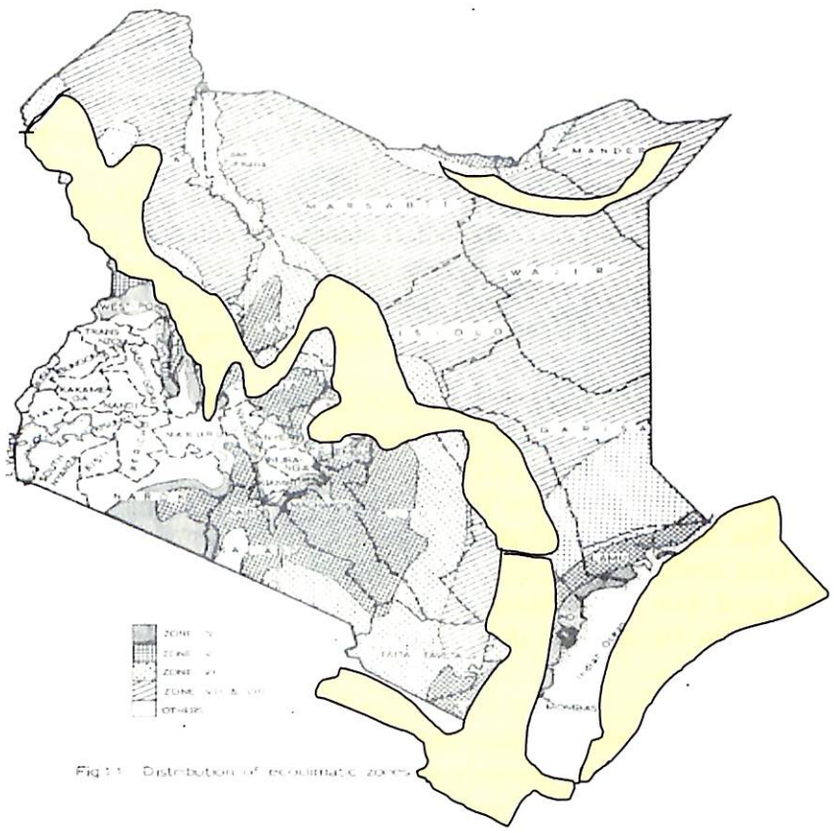
1.2 General Information and Need for Environmental Conservation and Vegetative Recovery in ASALs

Arid and semi-arid lands (ASALs) comprise all areas with rainfall of less than 250 to 1000 mm per annum. They are classified into four categories according to Thornthwaite moisture index ratio of precipitation to potential evapotranspiration (P/PET), namely, hyper arid <0.05, arid 0.05-0.20, semi-arid 0.21-0.50 and dry sub-humid 0.51-0.65. Approximately 473,000 km^2 (88%) of the land in Kenya is in arid and semi arid areas (KEFRI 1992).

ASALs are endowed with important woody resources for socio-economic development of Kenya. ASALs provide a home for about 7.5 million Kenyans and 54% of the country s livestock population. However, 30 —50% of the people have no guarantee of household food security even under normal and favourable weather conditions. ASALs also support tourism industry, as 90% of Kenya s gazetted national parks and game reserves are located. They provide a habitat for 65% of Kenya s wildlife, thus contributing significantly in generating foreign exchange. The woody resources found in ASALs are important for production of firewood, charcoal, wood carving, poles forage, medicinal plants for local health care needs, a wide range of non-timber products and for environmental conservation (Gatheru and Shaw 1998).

[2] **Eastern Province:** Moyale, Marasbit, Isiolo, Tharaka, Mbeere, Kitui, Makueni, Machakos. **North Eastern Province:** Wajir, Garissa, Mandera. **Coast Province:** Tana-River, Kilifi, Taita-Taveta, Kwale, Malindi. **Rift Valley Province:** Kajiado, Narok, Baringo, West Pokot, Turkana, Marakwet, Laikipia, Samburu.

In Kenya, the ASALs receive low and erratic rainfall and prone to cyclic episodes of drought, flood, famine, diseases and inadequate production activities. In ASALs, about 35 tonnes ha^{-1} is lost annually. Water scarcity is therefore a major factor limiting plant growth. Although some of



Kenya's permanent and longest rivers traverse the ASALs landscape served by a series of seasonal rivers. However, most of the water is lost partly due to denuded river basins. The degradation presents a threat to wildlife habitat, ecological balance and to rural livelihoods. Consequently, the long-term negative impacts resulting from high incidences of food insecurity, soil erosion and salinity, water scarcity, overexploitation of the woody resources, overgrazing, termite problem, ethnic conflicts, inadequate infrastructure and social services are critical challenges facing forestry development in ASALs.

The growing human population due to migration from the high and medium potential areas to the ASALs has increased pressure mainly for settled agriculture, accompanied by growth in livestock size without substantial change in the production system itself, leading to serious land degradation. The degradation has further been aggravated by use of inappropriate technologies to the ASAL environment, demand for firewood, increasing demand for productive employment, which has been met by charcoal and wood production to the detriment of the vegetation cover.

Forestry development is no longer seen as a sectoral issue, but is a component of an integrated national effort aimed at raising the living standards, creating employment, producing goods and services for the economy while at the same time contributing to environmental protection. Resources allocation to ASALs for the development in most sectors including forestry is not only low but also declining. In the forestry sector, management planning and resource allocation have

largely been devoted for the development of plantation forests and the protection of indigenous forests in the medium and high potential areas.

Government policy on the development of the ASALs has slowly evolved from no action to deliberate efforts in developing the ASAL and their integration to the national economy. The earliest effort dates back to 1953 under the African Land Development board (ALDEV) which was set up by the colonial government to deal with problems of the ASAL such as livestock pests, diseases and other activities such as soil erosion, vegetation and water management. Little was however, achieved as coercion was used in enforcing compliance.

Other policy instruments have been Sessional Paper No.1 of 1968 and the National Development Plan of 1989-1993, which gave due recognition to the economic potentials of the ASALs while at the same time acknowledging that some of the poorest people live in the ASALs. In 1989, a Ministry to specifically deal with the problems of the ASALs (Ministry of Reclamation and Development of Arid, Semi-arid and Wastelands —MRDASW) was created.

More recently, the Forests Bill 2000 and the Kenya Forest Development Policy 2000 have been developed with a view to focusing on the development of forest of Kenya. The later, expounds the contribution of farm forestry as an essential part of a diversified farm production, providing both subsistence and income while contributing to soil and water conservation. The Bill also support the involvement of the local communities in the creation of private and farm forests and their participation in the management of forests. The Policy pronouncement goes further to state that poverty reduction and the promotion of equity is possible not only from intensified farm production, but also through the development of small scale forest based industries, which create employment opportunities in the rural areas.

It is undeniable that institutions involved in environmental and natural resources in Kenya are many. There are separate ministries (Ministry of Environment and Natural resources, Ministry of Agriculture and Rural Development, Ministry of Energy, Office of the President), government departments (Department of Culture and Social Services, Water Resources), corporations, commissions, research and academic institutions (universities, colleges, KEFRI, Kenya Agricultural Research Institute (KARI), Kenya Wildlife Service (KWS) and National Museums of Kenya (NMK), development authorities (Kerio Valley Development Authority - KVDA, Tana and Athi River development Authority –TARDA, Coast Development Authority -CDA and Lake Basin Development Authority –LBDA), local agencies (Forest Action Network), international and bilateral agencies (ICRAF, ICIPE, JICA, GTZ among others).

The importance of the ASALs woody resources in contributing to the sustainable rural livelihoods cannot be overemphasized. Challenges facing ASALs forestry development are many but they can be resolved. However, it is necessary that the Forests Bill 2000 is enacted and operationalised so that the development of the forestry sector in ASALs becomes better organized for the benefit of its inhabitants.

2. Situation Analysis

2.1 Present Situation of Forest Resources in ASALs

Approximately 88% of the land in Kenya is arid and semi arid. They are fragile ecosystems that are difficult to rehabilitate once interfered with. Generally, the natural woody resources in ASALs are poorly managed and exploited as common property. Due to the past low population in ASALs,

there was the safety that the woody resources would be available for the inhabitants in perpetuity. However, with the growing population due to improved living conditions and immigration from the high potential areas, the rate of tree harvesting cannot match the rate of natural growth of the woody resources. As a result, there is a net loss of the forest resources in the ASALs.

Past woody surveys by public and private institution estimated that there were about 15.2 m^3 ha^{-1} of woody biomass in the ASALs. The surveys also revealed that there is an increasing volume of tree resources on the farms as compared to the public land. This is attributed to the improvement in tree management practiced by the individuals as compared to the community where no one takes responsibility in managing woody resources. Although on average, the annual increase is about 0.23 m^3 ha^{-1}, the projected demand for wood in ASALs is already in excess of the supply (Table 1).

Table 1. Projected supply and demand for wood in ASALs (000 m^3)

Year	1995	2000	2005	2010	2015	2020
Sustainable wood supply	11,886	11,961	12,042	12,127	12,214	12,303
Wood demand	10,530	12,656	14,637	16,742	18,887	21,063
Surplus	1,336	**-695**	**-2,595**	**-4,615**	**-6,673**	**-8,760**

Source: The Kenya Forestry Master Plan (1994).

It is commonly recognised that the local population in the ASALs is engaged in the following agricultural activities: livestock, crop, vegetable and fruit production, beekeeping and charcoal burning. It is widely recognised that farmers express more on socio-economic and agriculture related problems and priorities than forestry related problems. This is because farmers tend to think and seek short-term or immediate solutions. However, for long-term environmental or water resource conservation, forestry is the major component, and its priority is not low as ranked by farmers.

Therefore, there is urgent need for appropriate tree planting and management interventions to reverse this negative trend. The participation of the local communities and improved tree management on the farms is necessary for any success in reversing the negative trends in woody resources in the ASALs.

2.2 Problem and Need Analysis

Arising from the questionnaire analysis to establish the status and prospects for sustainable forest extension services, a variety of problems and needs were identified. Seven broad categories identified include finance and supplies, technical development, socio-economic, biophysical (rainfall, soil fertility, pests and diseases), information (awareness, knowledge, skills), institutional capacity (human resources) and policy and legislative issues relating to FD, KEFRI, SOFEM, local communities and farmers in ASALs and other stakeholders (including other public institutions and non-governmental organisations). The specific details, which are presented in Tables 2 to 6, can be considered as baseline information for development of a sustainable future forest extension service.

2.3 Strengths and Opportunities for Sustainable Forest Extension Development

From the questionnaire analysis to establish the status and prospects for sustainable forest extension services, a variety of strengths and opportunities were identified, which could provide solutions to the problems and needs for enhancement of sustainable forest extension system. The specific details are presented in Tables 2 to 6. As a way forward,

there is need to harmonise the approach to the management of the forest resources in the ASALs, so that the many players work for a common goal.

Table 2. Forest Department

Weaknesses	Strength/Opportunities
Forest Department ***Institutional problems*** ♦ Forest Extension Service Branch (FESB) is in charge of extension services. There are 75 professionals, 400 technical staff (Divisional Forest Extension Officers - DFEOs), and 1200 subordinate staff, who include Extension workers. Although FD has managed to deploy Diploma level officers to Divisional level, most of the Frontline Extension workers (FEW) at the location level are experienced workers who have been promoted from subordinate cadre and are a product of on-the-job training. There are 184 FEWs in 23 ASAL districts in Kenya[2]. The ideal situation would be to have forestry certificate holders in-charge of the frontline extension services. ♦ Inadequate forest extension infrastructure, which needs upgrading of offices, demonstration nurseries and related equipment in many divisions. ♦ High administrative costs (about 81.3% of total budget is personnel expenses in the fiscal year 2001/2002), and inadequate financial resources for project execution. ♦ Bureaucratic and hierarchical structure, thus slow administrative procedures. ♦ Forest extension services have been the monopoly of the public sector. However, collaboration with private sectors has not been vigorous. ♦ Inadequate budget allocation for extension services and exchequer problems makes it difficult to incur expenditure. ♦ Limited technical information on ASALs. ♦ Low prioritisation of forestry extension services under the existing institutional and funding arrangements. ♦ FD executes forest extension projects jointly with bilateral assistance, including Finland, Denmark, Belgium and Japan among others. ♦ Technical competence is available in the department, although it should be enhanced from time to time. ***Forest Extension Service Workers problems*** ♦ Low salary level for frontline extension workers. ♦ Limited opportunity for promotion and lack of motivation for their work. ♦ Inadequate technical skills in extension due to limited academic background, e.g. communication and extension skills. ♦ Inadequate facilitation, especially transportation, due to low budgetary allocation. ♦ Inadequate training opportunities. ♦ Limited resources for effective extension services.	**Forest Department** ♦ Forest Department (FD) has a work force of 6,281 persons. It is in charge of nationwide forest extension services. The extension staff is widely distributed in a well-established network in all administrative divisions. ♦ There has been tremendous improvement in the planning of forestry extension activities under the Medium Term Expenditure Framework (MTEF) process. For example, the operations and maintenance budget of FD increased from Kshs. 57,940,200 in the year 2000/2001 to Kshs. 91,645,020 for the financial year 2001/2002, thus an increase of 58%. ♦ The funds for extension related activities, has also increased from Kshs. 27,563,220 in the financial year 2000/2001 to Kshs. 38,915,334 in the 2001/2002, an increase of 41%. ♦ It is a requirement for all foresters at the divisional level to undertake baseline surveys, which will assist in better planning from the local community level. ♦ A restructured FD under the ongoing civil service reform programme will have forest extension as its core function. ♦ The Kenya Forestry Development Policy 2000 provides greatly for the support of forest extension. ♦ Within the FD, there is a full acceptance that the bulk of supply of forestry/tree products will have to be sourced from elsewhere (farms) other than from the dwindling forest areas. ♦ There is a high level of enthusiasm from the private sector regarding the involvement of key stakeholders in supporting forestry activities. ♦ Existence of functional Memorandum of Understanding (MOU) with other GOK departments that is in the natural resources sector.

Table 3. KEFRI

Weaknesses	Strength/Opportunities
KEFRI ♦ Inadequate training opportunity for scientists and technical staff in technology transfer. ♦ Slow pace of intra and inter-institutional collaboration and teamwork initiatives to facilitate/promote efficiency and effectiveness in providing solutions to research and extension problems. ♦ Delay in implementation of the Kenya Forestry Development Policy 2000 and the Forests Bill 2000 has affected potential support from willing donors and development. ♦ Budgetary constraints to meet the increasing demand for research and development (including extension services). ♦ Inadequate information flow and access to scientific and extension literature. ♦ Inadequate infrastructure for research and development in other KEFRI Regional Forestry Research Centres to provide a base for extension activities except in Muguga, Kitui and Maseno. ♦ Personnel costs still accounts for about 80% of total budget while operational costs accounts for 20%. However, efforts are being made to increase operational costs to about 40% of the total budget.	*KEFRI* ♦ The KEFRI s entire work force is 1,325 persons, comprising professionals, technical, administrative and support staff. ♦ Main contribution to forest extension is technology development and information dissemination through seminars and training, courses. ♦ Pilot grassroots extension services are provided in collaboration with FD and Kenya Agricultural Research Institute (KARI). ♦ GOK Budget for information dissemination operation is about Kshs. 1.2 million per annum. ♦ Consistent attempts to develop and enhance mechanisms for collaboration for example, through Memorandum of Understanding (MOU) and Agreements within and between different forest-related organisations and individuals. ♦ Enhance awareness among development partners, private sector (institutions) and individuals to seek joint solutions to forest-related problems of mutual interest and priority. ♦ A critical mass of a good mix of research and development expertise in several disciplines. ♦ Good opportunities for providing specific training needs to both technical and scientific staff through development partners and from internally generated income. ♦ High parliamentary rating for accountability and transparency of its financial management. ♦ Restructuring and staff rationalization to accommodate multidisciplinary approach in research and development. ♦ Farm forestry and Dryland forestry activities ranks high in KEFRI s research and development agenda. ♦ Enhance awareness among development partners, private sector (institutions) and individuals to seek joint solutions to forest-related problems of mutual interest and priority. ♦ A critical mass of scientists with expertise in several research and development disciplines. ♦ Opportunities exist to use the available facilities to facilitate flow of information and linkages at grassroots, technical and professional level. ♦ High possibilities of giving parliamentary consent to the proposed Kenya Forestry Development Policy 2000 and Forests Bill 2000. ♦ Opportunities for income generation and consultancy services to complement constrained budgetary allocation. ♦ Government funding to KEFRI accounts for 90% of its budget and 10% from donors, an indication of governments increasing commitment to the role of forestry research development.

Table 4. Local communities and farmers

Weaknesses	Strength/Opportunities
Farmers problems related to the forestry, agriculture, livestock and water resources ♦ No tree nurseries. ♦ Poor management of existing tree resources due to inadequate knowledge of tree management. ♦ Ungazetted hills leading to deforestation and inadequate water conservation measures. ♦ Indiscriminate tree felling on steep slopes hence land degradation. ♦ No proper agroforestry system due to inadequate knowledge and information. ♦ Inadequate information of the role of trees in environmental conservation. ♦ Unchecked system of tree exploitation in communally owned land. ♦ No woodlots on the farms hence inadequate tree resources. ♦ No ornamental and shade trees in most homesteads. ♦ Inadequate skills on tree/fruit planting and management. ♦ Inadequate knowledge on appropriate wood utilisation. ♦ Inadequate extension services. ♦ Destruction of young trees by livestock, especially after harvesting of the food crops when livestock is left loose to feed on the stovers. ♦ Termite menace. ♦ High incidences of pests and diseases attack on tree/fruit and crops. ♦ Long distances to fuelwood sources. ♦ Unreliable rainfall leading to low crop yield and productivity. ♦ High incidences of soil erosion due to fragile soils and inadequate soil conservation measures. ♦ Poor marketing strategies for farm products. ♦ Inadequate transportation to access market places. ♦ Inadequate knowledge on pasture management. ♦ Overgrazing and denuded lands. ♦ Inadequate knowledge on bee keeping. ♦ Communal land tenure system. ♦ Water scarcity for domestic, farming, and livestock. ♦ Unreliable rainfall and drought. ♦ High evapotranspiration rate. ♦ Inadequate knowledge on water harvesting and utilisation. ♦ Deforestation of water catchments. ♦ Migration of people to the marginal lands and increasing population in the ASALs. ♦ Inadequate knowledge on improved fallow.	♦ There is plenty of land for the establishment of farm forests if adequate technologies markets for products are developed. ♦ Households can provide adequate labour for the farm forestry activities. ♦ Rural livelihoods of the communities are closely linked to the use of wood biomass for a wide variety of uses hence their potential willingness to engage in tree planting and management. The indigenous knowledge and experience of the local communities should be harnessed for good results. ♦ There is great potential for farm forests in cushioning farmers' earnings during bad years. ♦ The communities and the private sector are willing to embrace extension activities due to sensitisation over the years.

Table 5. SOFEM Project

Weaknesses	Strengths/Opportunities
SOFEM Project ♦ Inadequate consultation and lack of proper focus on initiating some activities, e.g. mobile show and cost sharing. ♦ Lack of proper evaluation mechanism for specific activities, e.g. Demonstration plot at Tiva. ♦ Inadequate integration of project activities due to planning. ♦ Inadequate documentation of some activities, thus hindering effective monitoring and evaluation as well occasioning duplication, e.g. on-farm and on-station site conditions at plantation establishment. ♦ Budget for the project was no reflected in GOK funding process.	***SOFEM Project*** ♦ The impact of SFTP and SOFEM activities are evident. ♦ At the pilot scale, SOFEM has developed practical policies, technologies and approaches for ASALs forestry extension. This potential can be expanded to benefit other ASAL areas.

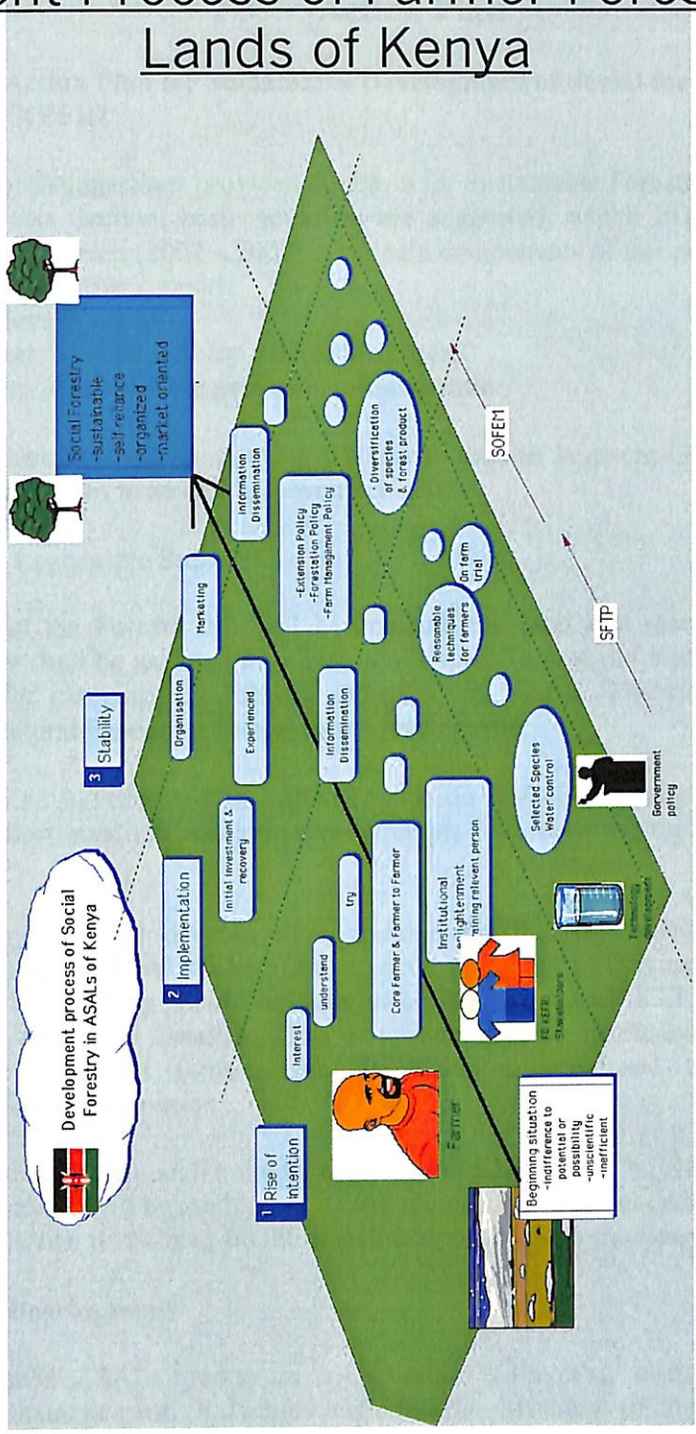
Table 6. Other stakeholders

Weaknesses	Strengths/Opportunities
Other Stakeholders	***Other Stakeholders***
Public Sector	***Public Sector***
The public sector institutions include Ministry of Agriculture and Rural Development, Ministry of Energy, Permanent Presidential Commission on Soil and Water Conservation (see Annex 1). ♦ Inadequate staffing. ♦ The same farmers participate in many other projects with different approaches, and this results in confusion. ♦ Farmer dependency on donor assistance. ♦ Poor logistical support. ♦ Limited funding. ♦ Duplication of organisational arrangements, type of services (efforts), and implementation. ♦ Inadequate stakeholder involvement. ♦ Top-down approach and supply-driven planning and implementation. ♦ Donor driven management, donor dependency, and less initiative by the state agencies, due to limited budgetary allocation of resources for extension work. ♦ Weak monitoring and evaluation systems. ♦ Lack of transparency and accountability of operation. ♦ Poor supervision at the field level. ♦ Inadequate knowledge on production, processing and marketing information for farm forestry products.	♦ Working closely with farmers as an integrated team approach even in monitoring. ♦ Utilise existing infrastructure to cover large areas. ♦ Participatory approach at all levels. ♦ Introduction of appropriate technology. ♦ Coordination of all players in the various sectors working with farmers. ♦ Ability to collaborate with others. ♦ Prioritising farmers short-term and long-term needs. ♦ Capacity building through training. ♦ Use of print and electronic media. ♦ There exists potential for the involvement of the private sector companies (tobacco industry) and other state corporations for contract tree growing with the farmers for the production of specific products. ♦ The private sector entrepreneurs can be guided by FD to venture on micro-financing of tree growing by farmers. ♦ There exist other key public institutions and with alternative strengths, e.g. Ministry of Agriculture and Rural Development, whose collaboration should be enlisted for successful forestry extension in ASALs.
Extension Projects ♦ Limited involvement of local people to enhance their initiative, ownership, and contribution. ♦ Inadequate sustainability of the traditional public extension system, in terms of financial, methodological, and institutional support. ♦ Lack of in-depth understanding of the dynamics of household socio-economic issues.	***Non-Timber Forest Products (NTFP) Industry*** ♦ There exists great potential in the raising of living standards of the people in the ASALs through the harnessing of earnings from NTFP. However, the trade in these products has been hampered by lack of information on the levels of production, processing infrastructure and marketing.
Non-governmental organisations (NGOs) ♦ Limited and overworked staff in some sections. ♦ Lack of clear institutional policy in some sectors. ♦ Endeavour to respond to all requests. ♦ Declining financial resources and low community awareness on local fund raising. ♦ Reduced donor responses in funding requests. ♦ Poor follow up of the project ♦ Dependence on unpredictable and unfavorable weather fluctuations. ♦ Interruptions from other crash programmes.	***Non-governmental organisations (NGOs)*** ♦ Flexible links between internal departments. ♦ Senior managements commitment and support. ♦ Participatory management approach. ♦ Experience with donors, and their support and good will. ♦ Proper financial management and reporting. ♦ Quick mobilisation of donor funds. ♦ Diversification of donors. ♦ Participation of NGOs in the development of the extension process can greatly be improved if the extent of collaboration can be harnessed.

2-4 Recommendations

1. The importance of participatory approach through community involvement in forestry extension cannot be overemphasized. Therefore, community involvement is a prerequisite to any demand-driven forestry extension services.
2. Mechanism/measures to sustain the good relations between the government and the people from conflict to harmonisation through social forestry and farm forestry concepts should be strengthened. For example, the farmer to farmer approach, policies and management guidelines.
3. Appropriate policies and technologies developed to promote sustainable forestry activities in the ASALs should be publicised and used. For example, demonstration plot, seed pre-treatment and germination techniques, private seedlings production, tree development and management, energy conservation and water harvesting and utilization.
4. Capacity building, for example, on the job training, group dynamics, technical training, and seminars are an integral component in the technical development of any community based forestry activities. Therefore, a self-evaluating capacity building should be in-built in the activity of the extension process to ensure sustainability. The recommended capacity building areas include:
   - Technology for on farm tree production and management.
   - Efficient technology for processing of tree products in collaboration with the cottage industry.
   - Incentives for tree growing and processing and improved marketing.
   - Effective way for community forest management and sustainable land use plan making through participation.
   - Intensified forest extension.
5. The status of SOFEM project as a trial extension activity (Process I —Enlightenment and Trial) in ASALs should be expanded from initiation and enhancement of awareness to implementation, given the success of its first stage. Forest extension should be considered as a long-term development strategy for ASALs. A new project proposal should ensure that Social forestry development process transforms into a model comprising three stages, namely: Process I —Enlightenment and Trial; Process II —Implementation and Process III —Expansion and Stability as presented in figure 1.
6. FD and other stakeholders should provide support to measures to accelerate enactment of the Forests Bill 2000 and ratification of the Kenya Forestry Development Policy 2000.
7. FD should negotiate for more funding for forest extension in ASALs through the Mid term expenditure framework (MTEF) process and inclusion of SOFEM in the forward budget.
8. Collaboration, especially at the grassroots level should be strengthened between FD, KEFRI, MoARD and other stakeholders. The development of an integrated extension system is a prerequisite for success in this area.
9. Appropriate action plans should be developed to address the above recommendations.

Development Process of Farmer Forestry in Dry Lands of Kenya



2.5 Action Plan

2.5.1 Mid-term Action Plan for Sustainable Development of Social forestry Implemented by FD and KEFRI

The recommendations/suggestions provided direction for Sustainable Forestry Extension Services in the ASALs. In this Section, basic activities are suggested, which FD and KEFRI should implement in the next 5 years (2002 – 2007). The main components of this action plan include:

1. Policy and legislative support.
2. Technical development.
3. Enhancement of social forestry extension system.
4. Development of sustainable extension infrastructure

.

A project proposal should be prepared along this line to request Japanese Government assistance after SOFEM project comes to an end in November 2002.

2.5.2 Policy and Legislative Support

It is anticipated that the Forests Bill will be enacted into land and that the Kenya Forestry Development Policy shall be gazetted into Sessional Paper. This would highly improve the legal and policy basis for carrying out forestry extension in Kenya. Therefore, the Ministry of Environment and Natural Resources should take a leading role.

Chapter 4 of the Kenya Forestry Masterplan (1994) on dryland forestry should be the main reference for any short, medium and long-term attempts in developing the forestry resources in the ASALs.

It is also necessary that FD develop a programme for the implementation of sustainable private/farm forestry in the ASALs. Therefore, capacity building of FD is a priority and should be the starting point. The training should be done in collaboration with KEFRI and at the Kenya Forestry training College in Londiani. The Divisional Forest Extension Officers (DFEOs), extension workers and lead farmers should receive a structured training to enhance implementation of forestry extension.

Muguga will become the national training centre, while Kitui will be the regional centre. In addition, one more centre will be established or strengthened as regional centre. It is expected that KEFRI should strengthen its training facilities and manpower under the cooperation with FD.

2.5.3 Technical Development

KEFRI will undertake ASALs studies in collaboration with other institutions implementing forestry resources management. Examples include FD, Ministry of Agriculture and Rural Development (MoARD) and selected farmers. The results would be used for enhancing, sustaining and evaluating extension policy, technology development and management of the ASALs.

Main study areas will include:

1. Technology for on-farm tree production and management (including water management).
2. Efficient technology for processing of tree products in collaboration with the cottage

industry.
3. Incentives for tree growing, processing and improved marketing infrastructure.
4. Effective way of community forest management and sustainable land use plan making through participation.
5. Intensified farm forestry through agroforestry.

2.5.4 Enhancement of Social Forestry Extension System

FD will assist in establishing working groups for enhancement of social forestry extension system. The groups will establish Target areas and Zones in Kitui District, Rift Valley and other selected areas. The groups will establish Extension Action Plans by Zone, and implement an Extension guideline for intensified activities. Target area under the recommendation of the Task Force and guided by a Forest Planning Officer, will use SOFEM Silviculture guideline, Farm forest management guideline and Social forestry extension guideline to advise the extension worker and leading farmers. The guidelines should be distributed and basic tasks assigned.

With farmer-to-farmer approach and on-station/on-farm demonstration activities, which has been used by SOFEM, the following should be tried and also considered in the discussion framework of community based forest management plan (include sustainable land use plan), whose basis is from sustainable community development plan:

1. Forestry Association or Farmer groups.
2. Funding for start-up, for example, cost sharing, ownership sharing and revolving fund.

2-1 Cost sharing

Government and some supporting organisations will assist in providing part of the planting input.

2-2 Ownership sharing

Government or an authorized organisation/investor and farmer, will invest in tree planting through partnership. The two parties will share tree planting, ownership and benefits by share rates, when the trees are harvested or utilised.

The government will provide planting materials, while the farmer will provide labour and land. The farmers may provide only labour for planting operation and management of plantation forests on public land.

3 Government and Private Sector Cooperation Planting (GCP planting)

Under GPC, plantation forests are established and managed on private land. The harvested trees are shared between the organisation and the landowner. The farmer/land owner is responsible for protecting the planted trees.

2.5.5 Development of Sustainable Extension Infrastructure

The Ministry of Environment and Natural Resources (MENR) should establish and advisory committee (AD) for sustainable development of social forestry. The committee should draw members from Ministry of Agriculture and Rural Development (MoARD) and related stakeholders. The secretariat will be at the Forest Extension Services Branch (FESB) of the Forest Department.

KEFRI should also establish a sub-advisory committee (SAC) to undertake studies on sustainable development of social forestry. Members of the sub-committee will be drawn from MoARD and related institutions.

The AD committee will consult from time to time on plans for the ministry and the project. The SAC committee will prepare study plan, evaluate it and entrust it to suitable institutions/group. The study areas will include documentation and dissemination of ASALs forestry technology database, prepare proposal such as JICA General Grant Aid for Tree Planting and Development survey as well as Clean Development mechanism (CDM). Under the auspices of the Kyoto protocol, article 12, provides for the establishment of forests for sinking atmospheric carbon through CDM. The carbon emitting agency/industry commits itself to the provision of funds for the establishment of forests for sequestrating the carbon.

These tools are also very useful for realization of political/administrative super-targets such as gender equity, poverty alleviation, participation, institutional strengthening, sustainability and stability.

FD and KEFRI will establish an integrated implementing group for Sustainable Forestry Extension in ASALs. The group should prepare an action plan and become an advisory unit for the related projects.

3.0 Conclusion

The importance of the ASALs woody resources in contributing to the sustainable rural livelihoods cannot be overemphasized. Challenges facing ASALs forestry development are many but they can be resolved. This will require an integrated extensive service (IES) that is supported by a self-evaluating and sustaining programme/project and activities. Social forestry has the potential to address these needs for the benefit of the ASAL people.

Annex 2 Policy of Extension Activities for Social Forestry

2-4-1 Development Process in ASALs of Kenya

2-4-1-1 Introducing Social Forestry

In the previous stage we mentioned the problems and opportunities on forest extension activities in the ASALs.

It is needless to re-emphasize the importance of the community in terms of participatory forest activities but whereas the traditional forest policy approach was forcing people, subordinating their preferences and ignoring their needs and profit.

In 1985 social forestry concept was introduced in ASALs of Kenya. It was aimed at sustainable forestry even in the ASALs. As a result the situation between government and people has been changing from conflict to co-existences, and a reasonable reform of the consciousness of government staff and the community at large has been attained.

In the period within which SFTP (1985-1992) has had the joint support of GOJ and GOK, they have succeeded in maintaining the training of relevant persons and successful enlightenment of the community on social forestry. In terms of technology development, they have developed certain technologies and appropriate policy for the ASALs.

2-4-1-2 Outputs of SOFEM Project

As next step of SFTP, the SOFEM project was to carry out a trial extension activity, to the farmers in ASALs. From this pilot extension activity, we realised that most of the people in ASALs are not aware of the potential and possibilities of forestry activity in ASALs. Therefore, the SOFEM project has started demonstration plots. In the farmer-to-farmer approach, some farmers (core farmers) are selected and trained in forestry. The core farmers are then encouraged to plant trees in their plot and engage in the other forestry activity they have learnt. As a result, the other farmers get attracted to the core farmers achievement, and some of them either started or intend to start the forestry activity. Farmer to farmer approach has been effective because of its persuasiveness.

We have therefore proved the possibility of farm forestry in dry land, and even confirmed the good results of the co-existence between the government and the community for sustained forestry activity. The next major step is to widen the practice of the extension service to the entire community.

2-4-1-3 Present Model (Appropriate Methodology)

The appropriate methodology of extension in SOFEM s stage includes the following:

1. Encouragement of people by showing them the possibility of forestry activity in the ASALs. This involves the use of core farmer and demonstration plots.
2. Technology development for forestry activity in ASALs, for instance the use of most appropriate kind of tree planting technique and adoption of effective and efficient trial of extension services, where farmer to farmer activity is one of them.
3. Availing of information on dissemination of appropriate technology and finding out the farmers needs.
4. Trainer-training for sustenance of self-reliance and activity by GOK.
5. New policy making for small scale rural development based on profit and need of the people.

2-4-1-4 Development Processes of Models

The development process involves the following steps.

Process I (enlightenment and trial)
The development of technology that meets the farmers' needs and formulation of policy that encourage participation of the community in the ASALs

Process II (implementation)
In this process, people who are involved in forestry will be divided into 2 groups. One is the people who are geared towards farm forest and the other person intends small scale farm tree planting.

In this stage, we need wide range policies of extension, forestation and farm management for the particular region.

To encourage the first group, technology development in particular areas are fundamental. Policies for farm forestry also have to be formulated and implemented.

The various stakeholders and forestry association should equally be encouraged to participate on the social forestry activity.

Process III (expand and stable)
Once sustained forestry has picked up, it is important to develop a marketing support that shall ensure more people get to know of the profitability of the forestry activity.

The present SOFEM is going into first stage to second stage.

2-4-2 Government Policies

In each stage of the development process, government should have necessary support based on clear policy of social forestry, e.g. a detailed support activity for the forestry association and the integrated environmental conservation policy of forestry in ASALs.

2-4-3 The Role of Stakeholders and Donors

The stakeholders or donor have the following roles to perform.

-Suggestion of forest development policy.
-The support of technology development strategies.
-The support for effective and sufficient implementation of extension activity and other informal activities.

A CONCEPT NOTE

ON

INTENSIFICATION OF PRODUCTION, PROCESSING AND MARKETING OF WOOD PRODUCTS IN KITUI DISTRICT

Kenya Forestry Research Institute
P O Box 20412
NAIROBI, KENYA

February 2002

1.2 Challenges Facing Forestry

The recently published Poverty Reduction Strategy Paper (PRSP), raises the following among key issues regarding rural poverty:

- poor farming methods and high cost of farm inputs
- Deforestation
- Poor processing technologies
- Lack of technology transfer in natural resources management
- Lack of reliable cash crops
- Lack of adequate credit facilities
- Inadequate research and extension services
- Poor infrastructure and market prices
- Unreliable rainfall in the dry areas

The incidence of poverty is well above 50% in the proposed project area. The proposed project should be designed to address the issue of poverty reduction through farm forestry interventions.

Some trees like African ebony have been over-exploited over time largely because there has not been adequate effort to domesticate them in the farms. In the project area some indigenous tree species such as *Tamarindus indica*, *Sclerocarya birrea* remain largely unutilized.

Charcoal is a major product in drylands but recovery rates are usually very low because of poor technologies. Efficient charcoal production technologies would reduce the rate of deforestation and increase incomes.

Marketing of forest products is seen as a severe problem in promotion of tree growing. Market information is almost lacking thus making trade in forest products very difficult.

Rainfall in the drylands is a major limiting factor in tree planting, as it is usually erratic and usually comes down in storms. With incorporation of water harvesting technologies in tree growing, problems of moisture management will be minimised.

The country is unable to meet its wood requirements and the bulk of the supplies is coming from unsustainable sources (e.g., clearing woodlands) and from fuelwood substitutes such as agricultural residues, recycled wood from worn-out posts, construction props etc. Within the planning horizon of the Kenya Forestry Master Plan (1995 –2020), it is established

three components: Technology development carries out on-station and on-farm experiments on tree establishment and management to develop practical technologies of planting and tending trees in the drylands. Developed technologies are also demonstrated to farmers.

The extension component facilitates establishment of farm forests by farmers through demonstration of practical techniques developed by the project. The main activities include training of target farmers, monitoring established woodlots, facilitation of grass root extension agents and development of extension materials. An extension model for semi-arid areas will be developed at the end of the project.

The information component of SOFEM is involved in developing appropriate extension methods on social forestry in semi-arid areas based on experiences accumulated through the project activities and information on social forestry extension gathered from outside the project. Information on social forestry extension is collected, processed and disseminated to extension agents and others involved in related activities through seminars, mobile shows and newsletters.

The project has identified candidate tree species for planting, which include *Melia volkensii*, *Dalbergia melanoxylon, Teminalia brownii* and several wild fruit trees. A major breakthrough has been made in the propagation of *M. volkensii.* However, further work is needed to refine the methods developed and also investigate on techniques to improve the propagation of seed *of T. brownii.* Much progress has also been made in developing tree planting techniques, but further verification is required.

Although the selected tree species show potential for commercial planting, plantation management techniques have not been developed.

2.2 District Forestry Development Project (DFDP) and Integrated Management of Natural Resources in Ukambani (INAREM)

The District Forestry Development Project (DFDP) is a bilateral development project between the governments of Kenya and Belgium with the goal of enhancing the contribution of Forestry to the districts economy. The project is based in Ukambani districts of Machakos, Makueni and Mwingi. The pilot phase commenced in 1997 and came to end in December 2001. INEREMU was formulated as the main phase and is focusing on conservation of hill tops, woodland management in the

plains, micro-credit to farmers neighbouring hill tops for crop production, micro-irrigation and studies on charcoal production.

3.0 IDENTIFIED GAPS FOR ENHANCED TREE MANAGEMENT AND DEVELOPMENT

As the need for tree planting in dry areas becomes apparent, efficient propagation of vigourous planting materials has been a problem. The situation is bad for those tree species that have poor germination by seed, e.g., *Melia volkensii*. Propagation techniques need to be known and where basics have been developed to be improved.

Inadequate moisture and poor soils, common in dry areas, have made it difficult to attain high survival rates after planting. Different tree species seem to demand variation in moisture and early treatment requirements in order to establish. Due to these difficulties, planting and early tending methods need to be perfected in order to improve survival rates in the field. This gap should be addressed if success in tree establishment and plantation development in dry areas has to be realized.

Tree planting in the dry areas has been going on in the last two or so decades and a reasonable cover of land by planted trees has been made. However, the level of management through silvicultural treatments has been poor and production is low. To justify economic investment in plantation forestry in dry areas, silvicultural treatments (thinning, pruning, pollarding, growth and yield data) need to be integrated in the management of the tree crops. Such information to support management is still inadequate and need development and improvement.

Due to the climate and nature of soils in the dry areas, the choice of agroforestry as an investment option of ensuring supply of wood raw materials, food, fodder for livestock, while also using nitrogen fixing tree species to replenish the soil fertility is inevitable. To succeed in developing a viable agroforestry system for the dry areas, an understanding of tree-crop interaction against the constraints of low moisture regimes and poor soils would be an asset to the endeavour.

Introduction of exotic tree species and increased planting of indigenous ones in monocultures may lead to emergences of new pests and diseases. Integrated pest management of new pests must be an integral part of tree management regimes. Methods for effective monitoring and intervention of out-breaks must be developed.

Productivity of plantations under dry area conditions will need to be improved in time through ensuring that quality seed or planting materials are used. To ensure this, a programme of generating information on genetic diversity of seed sources and tree improvement need to be established. Such a programme should also ensure that seed and clonal materials used for forest plantation development stand the tests of likely future changes in environmental conditions, but more so of new diseases and pests.

The ever-increasing population into the dry areas has resulted in increased demand for wood raw materials and therefore shortage of originally available forest and woodland products. To enable surviving with the low supply, efficient processing of the various forest products will reduce waste and therefore enhance conservation and availability in the future. Improved marketing of the processed products would also ensure increased income and therefore less harvesting from the forests.

Past and recent evaluations have indicated that developed technologies for tree planting, management and processing are not readily used by the farmers to improve their well being as expected. Such slow adoption of technologies has been a concern to the government and donors who have invested in the development of such technologies. Preliminary conclusion has shown that the information dissemination mechanism and the extension service system in the forestry development domains need to be improved. Such attention should ensure improved mechanism of transfer of relevant technologies to the target beneficiaries.

4.0 PROJECT DESCRIPTION

4.1 Core Problem

High level of poverty in dry areas resulting from narrow income base, inadequate information, inefficient production, use and marketing of tree resources among others.

4.2 Goal

To improve the living standards of dryland communities through intensification of farm-based wood and non-wood production, processing and marketing.

4.3 Purpose

To enhance farm-based wood production, processing and marketing.

4.4 Objectives/Output

The specific objectives of the project are to:

1. Develop technologies for tree production
2. Develop efficient technologies for processing of tree products
3. Analyse and improve marketing structures for tree products
4. Enhance adoption of technologies

4.5 Activities

Objective 1: Technologies for tree production developed

(a) Review tree propagation methods for selected priority species

(b) Develop appropriate management techniques for selected species

(c) Initiate tree improvement programme for *melia volkensii*

(d) Monitor tree pests and diseases

(e) Establish pilot plantation

Objective 2: Efficient Technologies for Processing of Tree Products Developed

(a) Review current processing technologies in dry areas for timber, fruits, wood carving and charcoal.

(b) Study the wood properties of *Melia volkensii* and other priority species.

(c) Develop appropriate wood conversion techniques.

(d) Develop processing methods appropriate for selected fruits.

(e) Support improved finishing technologies of wood carving products.

(f) Verify and promote improved technologies for charcoal production.

(g) Verify and promote efficient utilization of fuelwood.

Objective 3: Provide Incentives for Tree Growing, Processing and Marketing

(a) Support material inputs under cost-sharing arrangement for tree production utilization/processing and marketing.

(b) Link farmers to micro-credit institutions

Objective 4: Adoption of Technologies Enhanced

(a) Establish on-station and on-farm demonstration plantations.

(b) Train project staff to improve capacity in information packaging and dissemination.

(c) Train farmers and extension agents on production, processing and marketing skills.

4.0 BENEFICIARIES

The target beneficiaries will be subsistence farmers living in dry areas, entrepreneurs in wood-based cottage industry and traders in wood and non-wood based products

6.0 PARTNERS

KEFRI will be the main implementing institution. Collaborators will be the Forest Department, NGOs, CBOs and cooperatives and, private sector (Jua Kali).

7.0 FACILITIES

Land for on-station technology verification at Tiva Field Station and existing buildings in Kitui Regional Research Centre will be used to implement the project.

8.0 DURATION

The project will be implemented over a period of five years

Concept Note

on

Key Areas for the Proposed JICA Assistance for Arid and Semi-arid Lands Farm Forestry Development in Kenya

Prepared by

Forest Department
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March, 2002

Key Areas for the proposed JICA Assistance for ASAL Farm Forestry Development in Kenya

1. Introduction

Forest Department (FD), Kenya Forestry Research Institute (KEFRI) and JICA have been implementing a pilot technical cooperation project (SOFEM) since 1997. The project is scheduled to end in November 2002. The project site is in the Central, Chuluni and Kabati divisions of Kitui district.

2. The Key Outputs of SOFEM

Among the key outputs of the project are:-

1. Extension methodology, the farmer-to-farmer type, have been developed and tested
2. At the pilot level The beneficiary communities in the SOFEM project area has been sensitized and are willing to undertake rural tree planting.
3. Appropriate technologies for the establishment of on-farm forests have been developed

3. Post SOFEM Scenario.

If the outputs of SOFEM are expected to create reasonable impact on rural development and therefore assist in the process of poverty reduction, the results of this pilot project should be applied with a reasonable measure of intensity to a few divisions in Kitui district and in some two other districts which have similar ecological and socio-economic setting.

4. Proposed JICA Assistance for Farm Forestry Development in the ASALs

Background

The arid and semi-arid lands (ASALs) cover 80% of Kenya. The tree resource base of the ASALs is on the decline. For example the projected demand for wood in the ASALs is already in excess of the supply situation as indicated in the table below:-

	1995	2000	2005	2010	2015	2020
Sustainable wood supply	11886	11961	12042	12127	12214	12303
Wood demand	10530	12656	14637	16742	18887	21063
Surplus	**1336**	**-695**	**-2595**	**-4615**	**-6673**	**-8760**

Table 1: Projected supply and demand for wood in the ASAL districts ('000 m3)
Source: The Kenya Forestry Master Plan, Pg. 103.

From the above table it is clear that there is an urgent need for intervention so as to reverse this negative trend. The local communities in the ASALs have been depleting their natural resource base especially trees through unsustainable practices such as poor farming and inefficient charcoal production which has led to increasing incidences of poverty. The participation of the communities in these areas is necessary for any success in reversing this trend.

Government paper on poverty reduction

According to the recently published government paper on poverty, the Poverty Reduction Strategy Paper (PRSP) 2000, the following have been cited as the major causes of rural poverty: *poor farming methods and the high costs of inputs, deforestation, poor processing technologies, lack of technology transfer in natural resources management, lack of reliable cash crops, lack of adequate credit facilities, inadequate research and extension services, poor infrastructure and market prices, unreliable rainfall especially in the drylands.*

Although past efforts have been directed at fighting poverty by the government in partnership with the various bilateral and multilateral agencies including JICA, there is still a lot that requires to be done in order to raise the living standards of the rural communities. There is a lot of scope for achieving this objective through forestry development.

Key areas for intervention in farm forestry

The proposed assistance should address the following specific areas of farm forestry development in the ASALs:-

1. Forestry extension services, which is a prerequisite for technology transfer and information dissemination requires to be strengthened.

2. The potential for commercial farm forestry exists in the ASALs in relation to the diversification of income bases for the farmers in the ASALs and in contributing to the national timber output. Nationally, timber demand outstrips supply from gazetted forests. Commercial farm forestry especially in the ASALs has great potential to bridge the gap.

3. Demand for charcoal is a reality especially in the urban areas and it is necessary that farmers become efficient producers of charcoal from farm forests. Micro-financing will be required to support the take-off of commercial farm forestry.

4. Food security through cash cropping of trees (and fruit trees) is important in times of drought since trees will be less affected in such times than annual crops.

5. Dry season fodder is important in dry areas due to the importance of livestock in the local economies. Trees such as *Melia Volkensii* that demand heavy

pruning will serve the dual purpose of timber production as well as dry season fodder.

6. Trees should be used for soil conservation and fertility improvement. Soil structures in the dry areas are fragile and easily erodable. Soil nutrients are in some cases inadequate for crop production and trees with the capacity to improve soil fertility need to be integrated in all aspects of dryland farming system.

7. The production and processing of non-wood tree products should be enhanced.

8. The infrastructure for processing and marketing of products from farm forests should be enhanced.

4.1. Bridging Period after the Expiry SOFEM Project

A two (2) year post SOFEM project bridging period should be created. This should be with effect from 26th November, 2002. This period shall of necessity be used in the following manner:-

a) Concentrate on the dissemination of the results of the SOFEM project through the forest extension network. This work should be concentrated to the entire three divisions of Kitui district namely, Central, Chuluni and Kabati. This could also be extended to Tharaka and Mbeere districts of Eastern province of Kenya on a pilot basis.

b) Capacity building of the FD staff.

c) In conformity with the existing legislation and Forest Policy, the relevant farmer groups shall be formed.

d) The various options for the funding of a sustainable forest extension system shall be explored. These are to include Clean Development Mechanism (CDM), local cost sharing, ownership sharing, micro-financing of tree establishment etc. Other considerations should be the improvement of the processing and marketing of the tree and non-timber forestry products from the ASAL.

4.2. Deployment of an Individual JICA Forestry Expert

The individual expert shall be counterpart to the Chief Conservator of Forests (CCF) or his designee and shall assist FD in organizing a development study. The expert shall be expected to have the relevant experience in policy and management aspects of forestry extension in Kenya.

4.3. . Development Study

This activity shall be a venture between FD and JICA with support from KEFRI. The possibility of increasing the coverage of JICA supported ASAL farm forestry beyond the current project area shall be considered.

The development study shall concentrate on designing the mechanisms for strengthening the Forestry Extension Services (FES) in Kenya with special emphasis on ASAL forestry and to identify key areas of project type technical cooperation.

4.4 Development of Sustainable Forestry Extension Infrastructure

FD has in the past relied on a poor infrastructure for the delivery of forestry extension services. It is proposed that a mechanism for funding the improvement of forestry extension services under a **grant aid** be explored. This assistance should be directed to the improvement of model/demonstration tree nurseries, forestry offices, communication equipment and other related infrastructure especially means of transport.

17th October 2001

Dr. P. Konuche	Director KEFRI
Mr. J.M. Mutie	CCF FD
Mr. S. Matsuura	Deputy Representative JICA (K) Office
Mr. J.K. Kanithi	Ministry of Finance
Ms. M. Kenmiya	JICA (K) Office
Mr. E. Kinyangi	JICA (K) Office
Mr. D.W. Muita	FD Karura
Mr. J.K. Mbaya	FD Karura
Mr. A.M. Gondo	FD Kitui
Dr. B. Kigomo	KEFRI Muguga
Dr. B. Chikamai	KEFRI Muguga
Mr. M. Mukolwe	KEFRI Muguga
Mr. P. Barasa	KEFRI Muguga
Mr. J.M. Kimondo	KEFRI Kitui
Mr. B. Muok	KEFRI Kitui
Ms. J. Kimiti	KEFRI Kitui
Mr. A. Ioki	SOFEM/JICA
Mr. T. Mihara	SOFEM/JICA
Mr. K. Okamoto	SOFEM/JICA
Mr. S. Sakai	SOFEM/JICA

SUMMARY OF PROPOSED HANDING OVER SCHEDULE/POST SOFEM CO-OPERATION MEETING HELD AT KEFRI KITUI RRC

Your attention is kindly drawn to the above subject.

During the above mentioned meeting, various issues pertaining to handing over schedule and post SOFEM activities were discussed. Attached, please find the summary of the issues deliberated on.

The minutes will be sent to you later.

Thanks in advance,

Ken Shimizu
Co-ordinator SOFEM

Information copy to

All PIC Members

SUMMARY OF
PROPOSED HANDING OVER SCHEDULE/POST SOFEM MEETING HELD AT KEFRI KITUI RRC ON 12TH OCTOBER 2001

- The Deputy Resident Representative (Mr. Matsuura) in his opening speech during the meeting, highlighted the Overseas Development Assistance (ODA) to developing countries. He stated that JICA is willing to assist the developing countries but emphasised that such assistance will be drastically reduced world wide

A) HANDING OVER PROCESS

1. PROPOSED OUTLINE OF HANDING OVER

- Mr. Ioki brief the participants on the schedule and handing over process by the year 2002 when the SOFEM project comes to an end despite uncertainty on future cooperation between JICA and Kenya. He emphasized the significant of year 2002 in relation to the activities of SOFEM project.

2. PROCESSEVALUATION °°°MISSION TEAM

* End of November 2001-Submit sectional self evaluation reports to JICA - Tokyo Headquarters, Japan.
- December 2001 —Mr. Ioki (Chief Advisor) to attend the Committee meeting in Japan to discuss frame work of the Final Evaluation. Chief Advisor will present a proposal on concepts of Post SOFEM too.

- January/February 2002: Short term expert who will study impact assessment of SOFEM Project to come to Kenya.

- March 2002 —Final Evaluation Mission Team: The final evaluation will be a joint one between the Government of Kenya and Japan (JICA).

Note: SOFEM project has to make self evaluation report in November 2001.

3. SOFEM Project implementation in the year 2002

a) **Project data compilation**: Each Japanese Expert presented proposed outline of data compilation. The proposed sectional formats will be reviewed and subsequently applied for data compilation.
b) The Director reported that final revisions were being done on the Tiva Pilot Forest Management Plan to be approved by KEFRI Board of Management.
c)

Note: As soon as the management plan has been ready, he will give Mr. Ioki the plan so that it can be sent to HQ of JICA.

Technology Development section will review the compartments since some were done using enrichment planting.

On-farm: KEFRI/FD to continue monitoring after SOFEM Project.

Extension: The section is yet to prepare a management plan.
Note: Based on interim report of the Extension task force, this section has to prepare final management plan.

Information: Currently, the section does not have a Japanese Expert. Mr. Barasa and Mr. Shimizu will prepare a report on implementation and data compilation in the year 2002. Mr. Mukolwe, Training Manager KEFRI Muguga will be co-ordinating Information section activities.
Note: There was a suggestion form the Japanese side that some of the section s activities should be done at Muguga. This issue will be discussed Mr. Mukolwe and his section members by end of Nov. 2001 before coming over new Japanese Expert.

Project Workers: Project staff are currently being sensitised on retrenchment which will be done in phases during the months of December 2001, April 2002 and Sep. 2002. The Project will comply with all labour regulations. Other packages will be worked out by KEFRI Kitui Centre Director and Project Co-ordinator. KEFRI to notify those who will be affected.
Note:Workers to be retrenched in December 2001 to be informed by KEFRI by middle of November 2001.

The Project Co-ordinator informed members that some Project employees undertaking crucial duties for the Project like the Secretaries/Clerk (employed on annual contract basis) have been working with a lot of dedication for the Project for several years and requested KEFRI to consider them. The Director KEFRI to consider the issue when a formal recommendation is made.
Note: the Project coordinator will send official recommendation to the Director KEFRI by end of Nov. 2001.

B) POST SOFEM CO-OPERATION

Extension:
1. Forest Department said that they will continue with the extension activities as much as they can even though there was no detail plan.
2. There was a comment that the project s aim is to develop extension model therefore FD does not necessarily have to continue their activities in Kiuti. Most important thing is to make or develop future development plan by using this project s outcome. There were no concrete agreement on suggestion therefore there is needs for further discussion.
3. The Extension Task Force sent questionnaires to various places. Interim report will be presented by end of November 2001.

Cost sharing: Extension section will hand over polythene sales to a dealer in due course.

Mobile Show: Even though we have been successful on the implementation of this activity, there is need to change the concept for a more effective course after determination of SOFEM.

Note: In the impact assessment report of this activities which the section is working on, they have to mention its future plan.

Facilities: The KEFRI Centre Director will liaise with the Co-ordinator on maintenance of vehicles and machinery. The Co-ordinator called for maximum use of available facilities.

Possibilities of future co-operation:

- Director KEFRI submitted some components of research projects and agreed to prioritised and make clear what type of Japanese technical cooperation is needed.

- A Task Force comprising of Dr. Kigomo, Dr. Chikamai, Mr. Kimondo (KEFRI), Mr. Muita, Mr. Mutie and Ms. Ngige (FD) will hold a discussion forum at Machakos from 23rd to 26th October 2001. The Task Force will also deliberate on the way forward and areas of future co-operation including proposal on concepts of a new Project to be ready before Chief Advisor leaves for the meeting.
  NOTE: at next PIC meeting the task force will suggest their recommendation.

1. Develop practical techniques for establishment of farm forest in semi-arid areas.
1.1 Develop technology in the pilot forest
1.1.1 Development of basic tree planting technologies
1.1.1.1 Seeds germination

1.1.1.2 Root system

1.1.2 Verification of intensive planting management.
1.1.2.2. Mulching

1.1.2.2. Mulching

1.1.2.4 Water regime

1.1.3 Verification of planting technology
1.1.3.1 Monitoring of existing spacing plot

1.1.3.2 Study pruning of of existing plot

1.1.3.3 Study thinning of existing plot

1.1.3.4 Study coppicing of existing plot

..5 Supporting activity of technology development

1.1.5.2 Collection of references

1.1.5.3 Management of experimental plot and road network

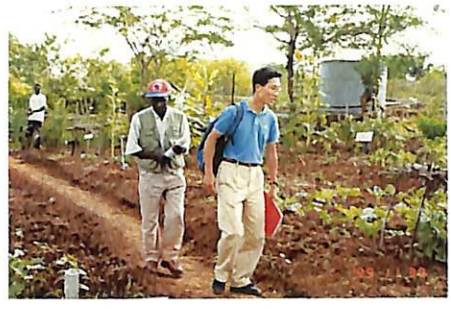
1.1.5.4 Response to challenges in on-farm and extension

1.2 Verify practical technologies by on-farm experiments.

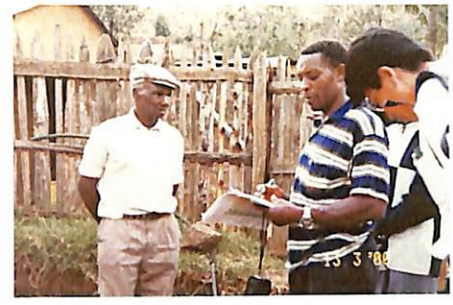
1.2.1 Farmers selection

1.1.5.4 Seed collection and production

1.2.1.1. Collection of physical & weather condition data



1.2.1.2 Selection of representative farmers



2.1.3 Technology workshop for selected farmers

1.2.1.3 Technology workshop for selected farmers

1.2.2.1 Water harvesting (micro-catchment)

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1.2.2.2 Site preparation

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1.2.2.3 Hole size

1.2.2.4 Weeding (complete, slashing,spot)

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1.2.2.4 Weeding (complete, slashing,spot)

1.2.2.5 Prunning

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1.2.2.6Experiments to respond to feed back from farm forest

1.2.2.6Experiments to respond to feed back from farm forest

1.2.3 Introduction of new technology
1.2.3.1 Fruit trees

2. Design, establish, monitor and evaluate farm forest
2.2. Collect & analyze information.

1.2.3.2 Fodder

1.2.4 Weather monitoring

2.3. Formulate strategic plan for promoting farm forest establishment by local residents
2.3.5 Conduct and monitor cost sharing system

2.4.1. Train extension agents

2.4.3 Train target farmers

2.4.3 Train target farmers

2.4.7 Monitor establishment of farm forests

2.5 Establish farmer extension system
2.5.2 Conduct and monitor farmer to farmer

3. Collect, synthesize and disseminate information on social forestry extension

3.1 Make preparations for information activities

3.2. Hold regular meetings

2.6 Improve demonstration plots in Tiva (Demo II)
2.6.2 Conduct and monitor OJT programme

3.6 Disseminate information through publication on events.

3.6.4 Disseminate information through other media

Kitui Centre

1.1.5 Supporting activity of technology development

1.1.5.2 Collection of references

1.1.5.3 Management of experimental plot and road network

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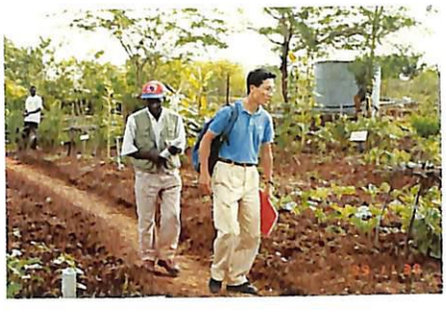

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Kitui Centre

SOFEM プロジェクト　マップ

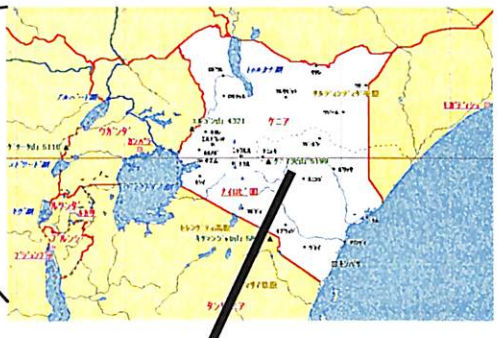
SOFEM Project Map

アフリカ全図

Africa

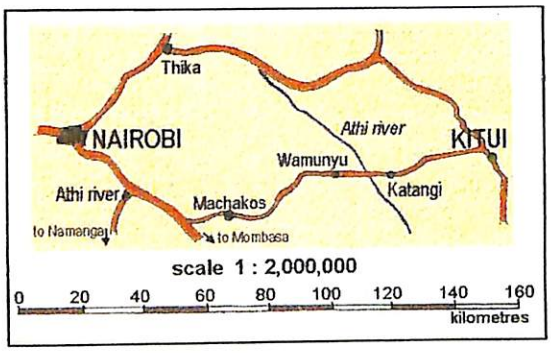
ケニア

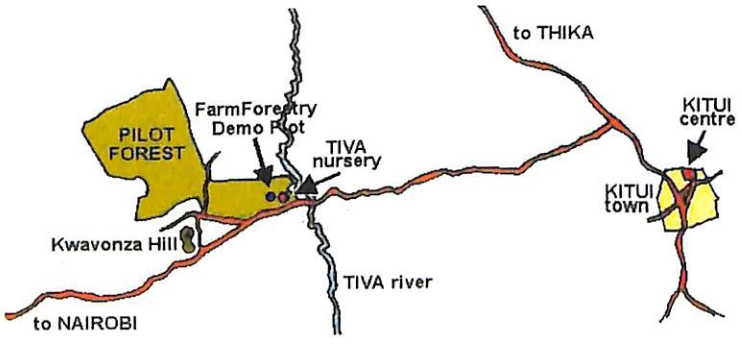
Kenva

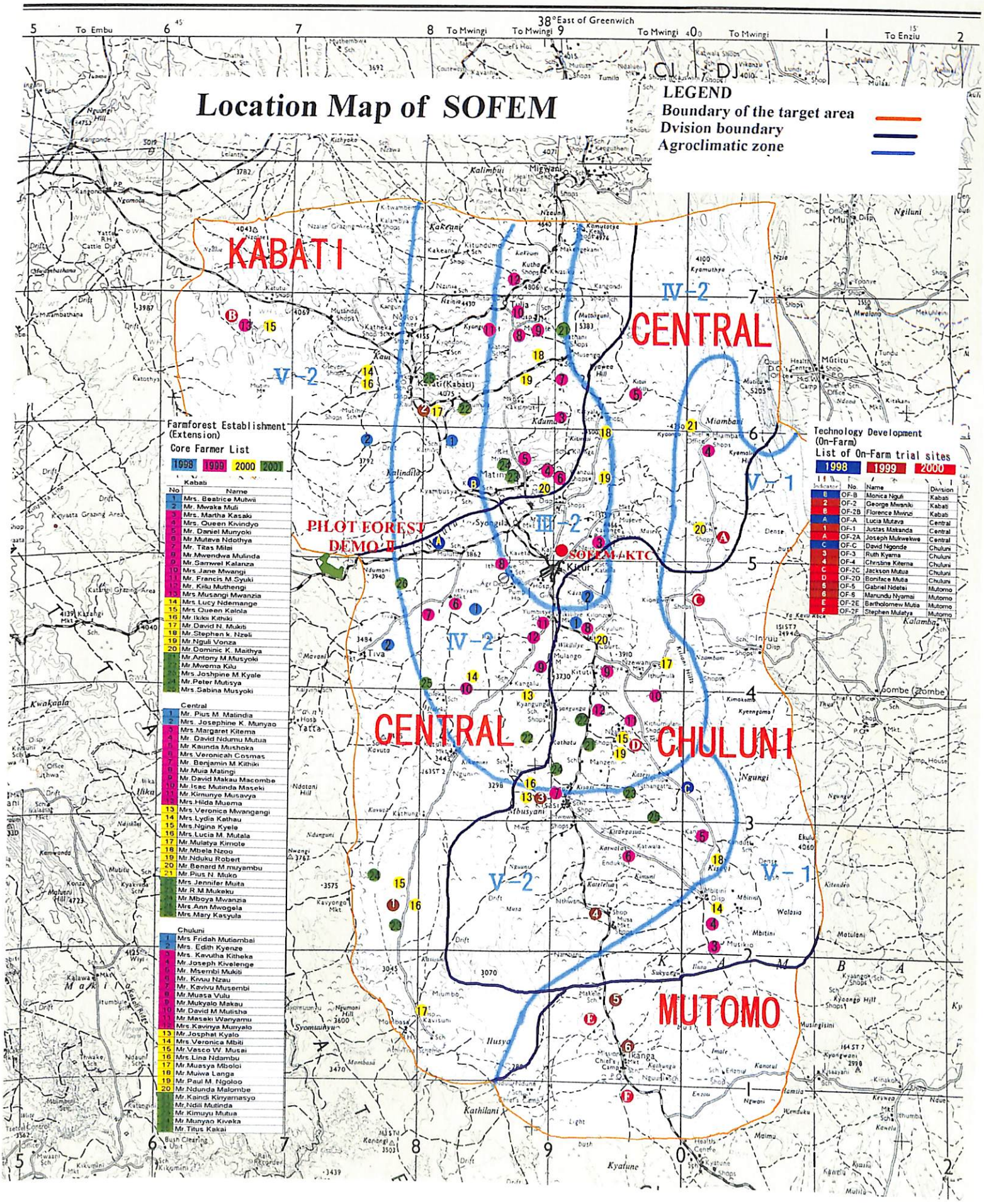


ナイロビからキツイへ

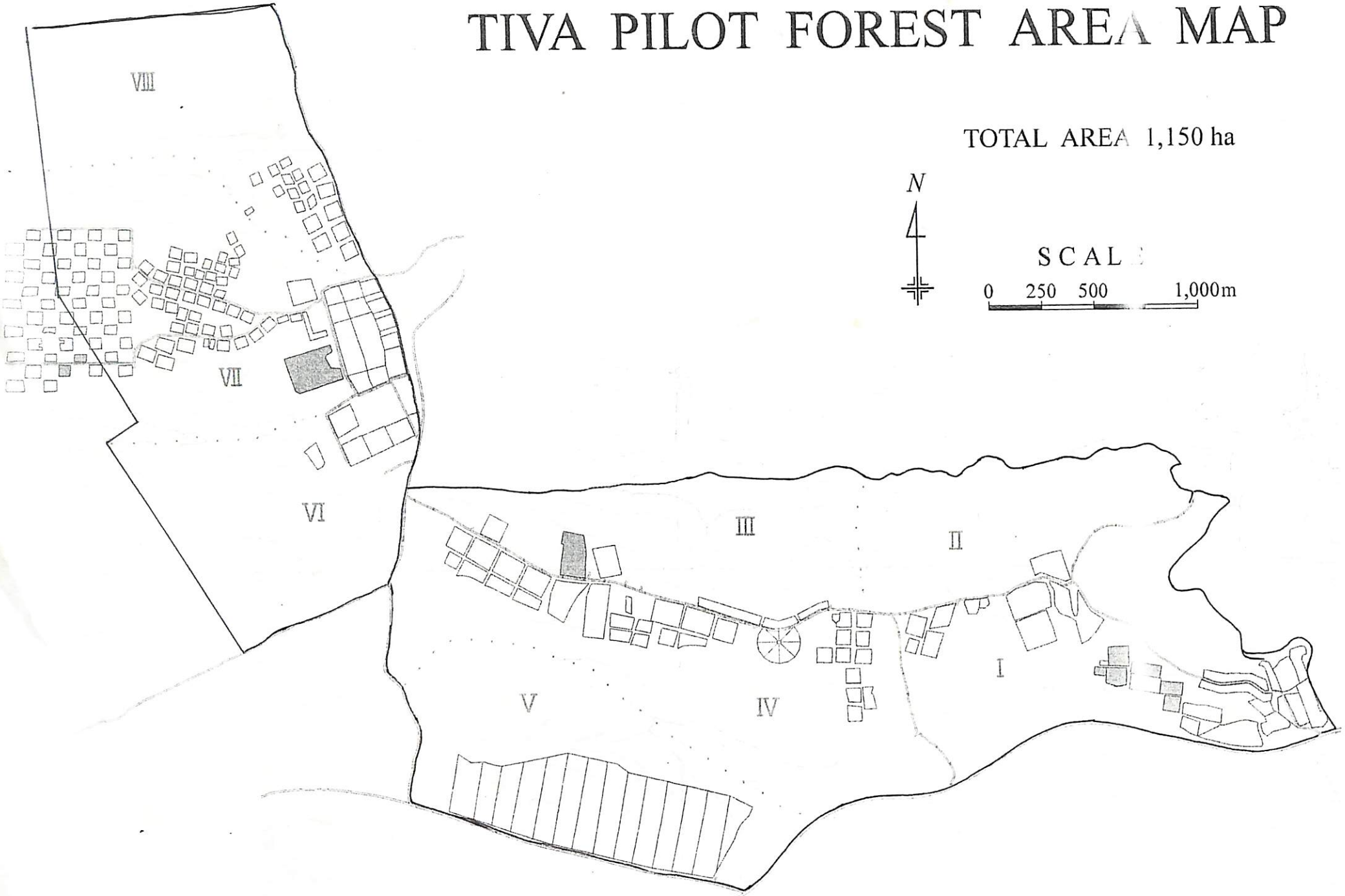
Nairobi and Kitui






Location Map of SOFEM
LEGEND
Boundary of the target area
Dvision boundary
Agroclimatic zone
38°East of Greenwich
To Embu
To Mwingi
To Enziu
KABATI
CENTRAL
CENTRAL
CHULUNI
MUTOMO
IV-2
V-2
V-1
III-2
PILOT FOREST
DEMO'T
SOFEM/KTC
Farmforest Establishment
(Extension)
Core Farmer List
1998 1999 2000 2001
Kabati
No Name
1 Mrs. Beatrice Mutwii
2 Mr. Mwaka Muli
3 Mrs. Martha Kasaki
4 Mrs. Queen Kivindyo
5 Mr. Daniel Munyoki
6 Mr.Muteva Ndothya
7 Mr. Titas Milai
8 Mr.Mwendwa Mulinda
9 Mr.Samwel Kalanza
10 Mrs. Jane Mwangi
11 Mr. Francis M.Syuki
12 Mr. Kilu Muthengi
13 Mrs.Musangi Mwanzia
14 Mrs. Lucy Ndemange
15 Mrs Queen Kalola
16 Mr.Ikiki Kithiki
17 Mr.David N. Mukiti
18 Mr.Stephen k. Nzeli
19 Mr.Nguli Vonza
20 Mr.Dominic K. Maithya
Mr.Antony M.Musyoki
Mr.Mwenna Kilu
Mrs.Joshpine M Kyale
Mr.Peter Mutisya
Mrs.Sabina Musyoki
Central
1 Mr. Pius M. Malinda
2 Mrs. Josephine K. Munyao
3 Mrs.Margaret Kitema
4 Mr. David Ndumu Mutua
5 Mr. Kaunda Mushoka
6 Mr.Veronicah Cosmas
7 Mr. Benjamin M.Kithiki
8 Mr.Muia Malingi
9 Mr.David Makau Macombe
10 Mr.Isac Mutinda Maseki
11 Mr.Kimunye Musavya
Mrs.Hilda Muema
13 Mrs.Veronica Mwangangi
14 Mrs.Lydia Kathau
15 Mrs.Ngina Kyele
16 Mrs.Lucia M. Mutala
17 Mr.Mulatya Kimote
18 Mr.Mbela Nzoo
19 Mr.Nduku Robert
20 Mr.Benard M.muyambu
21 Mr.Pius N. Muko
Mrs.Jennifer Muita
Mr.R.M.Mukeku
Mr.Mboya Mwanzia
Mrs.Ann Mwogela
Mrs.Mary Katyula
Chuluni
1 Mrs.Fridah Mutiambai
2 Mrs. Edith Kyenze
3 Mrs. Kavutha Kitheka
4 Mr.Joseph Kivelenge
5 Mr. Msembi Mukiti
6 Mr. Kivuu Nzau
7 Mr. Kavivu Musembi
8 Mr.Muasa Vulu
9 Mr.Mukyalo Makau
10 Mr.David M.Mutisha
11 Mr.Masaki Wanyamu
12 Mrs.Kavinya Munyalo
13 Mr.Josphat Kyalo
14 Mrs.Veronica Mbiti
15 Mr.Vasco W. Musai
16 Mrs.Lina Ndambu
17 Mr.Muasya Mboloi
18 Mr.Muiwa Langa
19 Mr.Paul M. Ngoloo
20 Mr.Ndunda Malombe
Mr.Kaindi Kinyamasyo
Mr.Ndili Mutinda
Mr.Kimuyu Mutua
Mr.Munyao Kiveka
Mr.Titus Kakai
Technology Development
(On-Farm)
List of On-Farm trial sites
1998 1999 2000
Indicator No. Name Division
B OF-B Monica Nguti Kabati
2 OF-2 George Mwaniki Kabati
B OF-2B Florence Mwinzi Kabati
A OF-A Lucia Mutava Central
1 OF-1 Justas Makanda Central
A OF-2A Joseph Mukwekwe Central
C OF-C David Ngonde Chuluni
3 OF-3 Ruth Kyama Chuluni
4 OF-4 Christine Kiterna Chuluni
C OF-2C Jackson Mutua Chuluni
D OF-2D Boniface Muta Chuluni
5 OF-5 Gabriel Ndetei Mutomo
6 OF-6 Manundu Nyamai Mutomo
E OF-2E Bartholomew Muta Mutomo
F OF-2F Stephen Mulatya Mutomo

TIVA PILOT FOREST AREA MAP



TIVA PILOT FOREST AREA MAP

① Nursery
② Demonstration Ⅱ
③ Dry season planting '96
④ Weeding trial '99
⑤ Sun heat shild effect trial '99
⑥ Wild fruits demonstration '99
⑦ Intercropping trial '00
⑧ Intercropping trial '01
⑨ Contour planting trial '01
⑩ Trenching trial '01
⑪ M. volkensii demonstration '01
⑫ D. melanoxylon demonstration '01
⑬ Tower site planting '95
⑭ Tree establishment trials '93-'95
⑮ Peoples plantation (SFTP)
⑯ Contour planting '94
⑰ Coppicing trial '96
⑱ Pruning trial '96

S = 1 : 25,000

N