

CHAPTER 9 SELECTION OF A MODEL AREA

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9.1 Criteria for the Selection of a Mode

Mutual agreement between the chief(s) of TA(s) and inhabitants concerned on the proposed project plays a key role in implementing it successfully. Keeping this in mind, model area within the SA., will carefully be selected in consultation with the administration offices concerned, referring to the determined result of zoning, so that the selected areas can satisfy the following criteria.

- the size of a candidate model should range from 1,000 ha - 5,000 ha, taking into account timely implementation of village natural resources management and earlier realization of benefit thereof,
- the area is a priority for implementing conservation measures, because of serious land deterioration,
- the area where TA chief(s) and group village headmen concerned have understanding on conservation measures and activities of NGOs, and can cooperate with them.
- the area where inhabitants have express willingness to participate in project with sound solidarity,
- the area with a good access to markets,
- the area with ample opportunities of engagement in income generating activities,
- the area where high degree of demonstration effect can be expected and
- the area where the proposed project components are readily implemented without resort to compulsory land expropriation from inhabitants concerned.

9.2 Selection of Candidate Model Areas

As a result of the site study and the consultation with the government organizations concerned, the following project areas were examined as candidate model areas. The outline of each candidate model area and project components anticipated in it are shown in Table 9.1 and Table 9.2, respectively. Likewise, the location of these model areas is illustrated in Figure.9.1 and the details are presented in Annex A-2.

9.3 Evaluation of Candidate Model Areas

Each model area was evaluated in accordance to the selection criteria to finally choose the most suitable one. The result of evaluation is shown in Table 9.3. The M3 has the highest marks in the evaluation, while M1 has the lowest of the candidate model area.

Table 9.1 Outline of Candidate Model Areas

Candidate Model Area	Zone	Area (ha)	Proposed Projects	Organizations Concerned
M 1	E	995	Water rehabilitation in semi-arid zone	DF, MASAF reforestation project
M 2	D	2,640	Riverbank reforestation, village community watershed management plan	DF, ADD, DWD
M 3	B	2,974	Riverbank reforestation, village community watershed management plan	DF, ADD, DWD
M 4	C & D	1,558	Afforestation in hill-side & hill-top, village community watershed rehabilitation plan	ADD, DF, MASAF's Proposed reforestation project
M 5	D	1,438	Reforestation in hill-side & hill-top	DF, ADD
M 6	D	678	Reforestation in hill-side & hill-top	MASAF's proposed project
M 7	A	1,361	Reforestation in mountainous area	DF
M 8	A	787	Large scale reforestation in mountainous area	DF, ADD

Table 9.2 Major Project Components in Candidate Model Areas

Candidate Model Area	Major Project Components	Organization for O&M	NGOs
M1	Tree Nurseries Reforestation	DF VNRMC	MASAF
M2, M3	Tree Nurseries Reforestation along River Banks Reforestation in Village Communities Alley Cropping Protection Works at River Bank Rehabilitation and Expansion of Reservoirs Income Generation Activities Adult Education and Enlightenment Project	DF DWD ADD	FIFA
M4	Tree Nurseries Reforestation in Village Communities Alley Cropping Rehabilitation and Expansion of Reservoirs Income Generation Activities Adult Education and Enlightenment Project	DF ADD VNRMC	
M5, M6, M8	Tree Nurseries Reforestation over hill-side and hill-top Alley Cropping Income Generation Activities Adult Education and Enlightenment Project	DF ADD	
M7	Reforestation in mountainous area Large Scale Soil Conservation Works	DF	

Table 9.3 Evaluation of Candidate Model Area

Proposed Model Area	Land degradation	Opportunity of income generating activities	Impact on community	Accessibility to markets	Willingness of community	Effectiveness of exhibition	Difficulty in land expropriation
M1	X	X	△	X	△	X	○
M2	△	△	○	○	△	○	○
M3	△	○	○	○	○	○	○
M4	X	○	△	△	○	△	○
M5	X	△	△	X	△	X	○
M6	X	△	△	X	△	X	○
M7	X	△	○	○	○	X	X
M8	X	X	△	X	△	○	○

Note : Evaluation Standard: ○ good, △ normal, X bad

For the evaluation of land degradation, X indicates some degree of necessity for conservation, and △ shows exigency of taking conservatory measures.

CHAPTER 10 THE MODEL AREA (MA)

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10.1 The Model Area (MA)

- 1) In the first session of the Steering Committee Meetings held in June 2000, the Study Team selected M3 as listed in Table 9.1 out of M1 ~ M8 as model areas for formulation of VNRMP.
- 2) M3 is located between Lunzu River and a district road, with an area of 3,864 ha. The MA was deemed suitable as a model because it has the conditions commonly found throughout the SA.

10.2 Location and Natural Conditions of the MA

The MA, accounting for 3,864 ha, is located at the center of the SA. Along the eastern border of the MA is Lunzu river, while along the western edge of the MA is a district road running towards Tezani Dam. Outside of the southern border lies Chileka Dambo. The overall topography shows gentle downward slope (1% or less) towards north. A remnant hill, Chilangoma, lies in the southwestern edge that has highest altitude in the MA, and hilly area in the MA is confined to the area along the district road where the Mombo Trading Center is located.

The western half of the MA belongs to watershed area of Nkokodzi river that is perennial and stems from Chileka Dambo (lowland). The eastern half is covered by small basin of perennial tributaries of Ntenjele and Nasonje rivers. The climate in the MA is characterized with semi-arid, with average annual rainfall ranging from 650 (northwestern border) ~ 850 mm (southeastern border). Natural vegetation cover almost disappeared since several decades ago but secondary Miombo type woodland can still be seen over steep slope. In the southern part of the MA grassland of the steppe type predominates with dispersed mango trees. Dry climate is observed with the presence of Baobab trees (*Adansonia digitata*) and *Lonchocarpus capassa*. Tree canopy covers only 2% of the ground surface, leading to moisture loss by wind and surface evaporation. Vegetation cover tends to be thicker over hilly area distributed in the western and the southeastern parts of the MA, but is thinner near Chileka dambo and over the flat plateau extending to the center of the MA.

The soils found in the MA can be divided into two soil families under the same soil group, Eutric-Fersialic according to FAO soil classification. Haplic Lixisols, originated from gneiss and granulite are distributed in the western half of the MA. These soils contain less aluminium oxides but more ferrous oxide and silica, and they may have formed in low-lying peneplain. Another group, Chromic Luvisols are found along Lunzu river and Chilangoma hills. Soil texture of cultivated, top-soil layers ranges from sandy loam to sandy clay, often containing gravel and un-weathered stone. Sub-soil layers at the depth of 40 cm or deeper from ground surface have often fine texture like heavy clay, and coverage of soil layers are as thick as one meter or more. Soil reaction of these soils shows acidic (pH 4.5 ~ 5.5) and plant nutrient remain poor in nitrogen (Haplic Lixisols) and phosphorus (Chromic Luvisols). Humus content of Chromic Luvisols is generally poor as a result of incessant deprivation by cultivation practice. In the case of Haplic Lixisols, humus content tends to be higher in lowland field. Chromic Luvisols with clay sub-soil can hold higher soil moisture available for dry-season crops like cassava and sweet potato. Besides, very limited alluvial or hydro-morphic soils cover river terraces where vegetable gardens are developed.

Water resources is rather scanty though three perennial rivers flow in the MA pouring into Lunzu river. The total length of these rivers within MA extends to more than 20 km and sustaining dimba area measured at 62 ha (1.6%) in total. Actually, surface running water can be use for irrigation for 6 ~ 8 months in dimba area.

10.3 Current Water Resources

(a) Surface Water

1) Rivers and tributaries

There are 2 rivers and 16 tributaries in the MA (See Table 10.1). Perennial flow is observed only in 2 rivers and 3 tributaries namely Lunzu, Nkokozdi, Ntenjela, Nasonje, and Milala. Gradient of river beds is extremely steep. According to the site investigation and topographic survey, perennial flow are found in catchment area which is bigger than 3 km². Flood occurs between beginning of January and middle of March. Because of short term heavy precipitation during December and February, there are no storage site to keep flood water and steep gradient rivers, as flood flows into the Lunzu and Nkokodzi rivers directly. Topographic characteristic of rivers and tributaries in the MA are summarized in Table 10.1.

Table 10.1 Summary of Rivers in the MA

Main River	Tributaries	C.A.(km ²)	River Length (m)	Gradient(1/xx)	Remarks
Lunzu		321.70	49,300	1/75	Perennial
	Sindoko	0.45	900	1/36	Dry arroyo
	Malengero	0.48	1,000	1/25	-do-
	Karonga	0.40	1,150	1/38	-do-
	Nkoka	0.39	1,250	1/28	-do-
	Thipwa	1.10	1,450	1/32	-do-
	Kabedi	0.36	800	1/40	-do-
	Chigadi	0.44	1,000	1/33	-do-
	Kakhonje	1.98	2,500	1/50	-do-
	Ntenjela	17.71	6,600	1/57	Perennial
	Nasonje	3.23	3,600	1/42	Perennial
Nkokozdi		72.70	17,600	1/125	Perennial
	Kachere	1.31	1,900	1/42	Dry arroyo
	Kaweta	0.95	1,750	1/32	-do-
	Nambinda	1.41	2,300	1/46	-do-
	Kabowa	1.99	2,200	1/40	-do-
	Milala	8.92	5,700	1/63	Perennial
	Namingambo	5.29	6,600	1/104	Dry arroyo

No river flow gauging station is found in the MA. According to the site investigation, perennial flow is observed as follows. Dry season discharge in Lunzu and Nkokodzi is about 3 times as much as that of their tributaries. Nkokodzi river discharge changes from 0.09 m³/sec in August to 0.03 m³/sec in October and that of Lunzu river is generally 0.20 m³/sec throughout the dry season but sometimes dried up in October. On the other hand, other perennial tributaries have flows between 0.005-0.03 m³/sec in August and normally dried up in October.

Table 10.2 Perennial Flow Rivers in the MA

River Name	Observation Village	Discharge (m ³ /sec) (*)	Remarks
Lunzu	Ndemanje	0.20	Max. water level is 3.0m higher than the river bed during Dec. to Mar. Usually discharge in Oct. is same as in Aug.
Khungula	Kammata	0.01	Max. water Level is 1.5m in Feb. Flow is dried up in Oct.
Nkokodzi	Kaumbata	0.09	Discharge in Aug. becomes half in Oct.
Nkokodzi	Kamtumbiza	0.125	Max. Water Level occurs in Jan. to Feb & 4m higher than the river bed. Dimba Irrigation
Ntenjera	Makanani	0.03	Flood occurs in Jan. & Feb. and water level is 3.0m higher than the river bed.

Nasonje	Ndemanje	0.005	Flood occurs in Jan. & Feb. and water level is 1.0 m higher than the bank. Erosion is heavy both river slopes.
Milala	Teula	0.03	Flood occurs in Dec. & Jan. and water level is 1.0m higher than the dam crest.
Namingambo	Lemu	None (1.2litter/sec)	underflow water. Flood occurs Jan. to Feb. and water level is 30cm higher than the river bed.

(*) Discharge of rivers are observed in the beginning of August by Study Team.

Along the perennial rivers and tributaries at streambanks, dimba irrigation is practiced but in small scale because of limited water in the dry season (See Table 10.3). Table 10.3 below shows the summary of the dimba irrigation. Streambanks cultivation is to be one of the major sources of erosion and siltation in the MA because surface soils in the fields are flushed directly into the rivers and tributaries during the rainy season in areas without ridges and drainage systems.

Twice, in the morning and evening, farmers irrigate dimba land using watering cans. During rainy season occurring from December to March, almost all farm land is inundated and farming practice is difficult. River discharges are only about 5 to 200 liter/sec and this is the reason why large scale farming is difficult to develop. In some places farmers dig shallow wells to get water in November to December. In Namingambo river at Lemu village, discharge is little but seepage flow exists a lot. Flood occurs between January and February and the water level rise to 30 cm above the terraces of river banks. Using this flood condition, about 12 farmers plant paddy from November to April. Damages from aphids, elegant grasshoppers, termite and pests, sunburns, leaf-blight and poor marketing system are found as constraints on cash crop production.

Main constraints

- Gauging stations at perennial flow rivers should be installed to measure the discharges and flood mechanism.
- Construction of bridges is necessary because farmers find it difficult to go to the markets or boreholes by crossing the rivers from January to March due to inundation of flood water.
- River banks are eroded by flood water especially in Nasonje, Nkokodzi, and Lunzu rivers. Forestation along both banks is necessary.
- Ridges and drainage facilities should be adopted to prevent from erosion and siltation at streambanks cultivation.
- To keep water for dimba irrigation, small scale weir should be constructed at perennial rivers and tributaries.

Table 10.3 Summary of Dimba Irrigation at Rivers and Tributaries

Location (village)	River	Irrigation Area (m ²)	Crops	Remarks
Ndemanje	Lunzu	400	Tomato, Pumpkin leaf, Rape	Flood occurs Dec. to Mar.
Salimu	Lunzu	800	Rape, Chinese Cabbage, Onion	Seeds is purchased at Lunzu but difficult to get. At 3 times cultivation/ year
Salimu	Stream	300	-do-	Shallow well
Siyamdima	Lunze	-	-	No seeds and watering cans
Ndemanje	Nasonje	About 2,000	Tomato, Pumpkin leaf, Rape	Flood occurs Jan. to Feb.
Kammata	Ntenjera (Khungul)	100-200	Tomato, Pumpkin leaf	Area is inundated from Dec. to Mar & WLI is 1.5m height. Shallow well is used from Dec. due to absence of water in the river.
Kammata	Chingawe	100	Tomato, Pumpkin	Shallow well, stream is dried up.
Chikaja	Milala	30	Planting	Confluence at Milala and Nkokodzi

Location (village)	River	Irrigation Area (m ²)	Crops	Remarks
Kaumbata	Nkokodzi	100-200	Chinese Rape, Tomato Rape	Area is inundated from Dec. to Feb. Fishing
Kamtumbiza	Nkokodzi	150	Tomato, Rape, Onion	Area is inundated in Jan. to Feb. & WL is 4m height
Nanjiwa	Nkokodzi	200-300 10 Farmers	Tomato, Rape, Cabbage	Area is inundated in Feb. & WL is 1.5m height.
Lemu	Naminga mbo	300-400 12 Farmers	Chinese Rape, Rape, Rice	Plenty of underflow water. Flood occurs Jan. and Feb. and its depth is 30cm. Rice crop
Teula	-do-	1,000 5 Farmers	Rape, Onion, Rice, Chinese Rape	Confluence at Namingambo and Nkokodzi From Oct. rice cropping. It takes 3 hours to Lunzu town to sell vegetables.

2) Dams

Only 2 dams are found in the MA, namely Milala and Ntenjela dams (See [Figure 11-1](#)). As for Ntenjela dam reservoir water depth is quite shallow and about 1.0 m in the dry season due to long term sedimentation. About 80% of reservoir area are buried by soils and covered by reed. In the flood season between January and February, water level usually becomes about 1.0m higher than the dike crest. Inflow to the reservoir is dried up in October. Around the reservoir area, dimba irrigation practice is remarkable. Rape, Chinese rape, mustard, onion, tomato are planted. Farmers irrigate water using watering cans two times in the morning and evening per day. Irrigation water used in the fields is more than enough. For example, a woman fetches water 32 times per one time to the 65m² area of field. This water pours to the field about 2.4 liter/sec/ha and it is too much while 1/3 volume of that water is enough. In the fields, there are no ridges or drainage facilities. Too much soil runoff occurs reaches the reservoir in the rainy season. Constraints are summarized below.

- Soil runoff from dimba irrigation fields is considerable during the rainy season because there are no ridges and drainage facilities in the fields to hinder the flow.
- About 80% of reservoir is buried by sediments and dredging is necessary.
- Effective water storage is too little to cover the desired command area. It is necessary to increase dam crest by about 1.0 m with ancillary facilities to store more water during the rainy season for dimba irrigation.
- Dam water tends to be abused with too frequent watering by watering cans. Irrigation technique should be introduced to reduce water for the dimba irrigation fields. Also, shallow wells should be constructed in the fields to reduce the watering works because groundwater level is very high.
- Market prices become cheaper because farmers plant the same kind of vegetables which are produced at the same time.
- Enlightenment and extension of irrigated farming techniques are not yet made, so it will be necessary to extend irrigation and agricultural know-how under this Project.

Milala dam was built by the Colonial Government. It has about 5 ha of water surface area and is 7 m deep at the deepest point. Dam is now faced with continuous sedimentation. Water level during the dry season becomes shallower year by year and rises to about 1m higher than the dam crest in December to January. Water flow stops in October. Dimba irrigation is difficult to sense at right side of reservoir because of outcrop of rocks. About 0.2 ha area of Dimba irrigation is practiced at left side and downstream of reservoir. Compared to the Ntenjela dam, dimba irrigation is not active. Intake facility of 150mm PVC pipe was installed and gravity irrigation is carried out at downstream but no control gate was installed. Generally, stored water is not used effectively. Constraints and farmers requests thereof are summarized as follows.

- Fish is not available to villagers who suffer from deficiency of proteins, with only field mice as their source although even that are also depleting. Introduction of new fish species such as trout (*Mbuta*) is

desirable for aquaculture in these reservoirs.

- With the decrease in stored water , villagers want to expand and dredge their reservoirs.
- It is necessary to increase dam crest by about 1.0 m with ancillary facilities to store more rainy season water for dimba irrigation and aquaculture.
- Treadle and diesel pumps are required. Because of outcrop of rock at right side of reservoir, irrigation in that part is difficult.
- From above mentioned reasons, it is desired to extend irrigation and agricultural know-how.

Table 10.4 Summary of Dam Dimension

Item	Ntenjera Dam	Milala Dam
Construction	1958	1958
Dam Committee	None	Established in 1997
Related villages	Makanami	Lemu, Teula, Manjelo
Dam		
Length (earth fill and masonry)	38m (18m in Masonry)	50m (30m in Masonry)
Width	4m	4m
Height	n.a.	n.a.
Ancillary Facility	none	Intake PVC Φ 150
Reservoir		
Catchment Area	1,529.0 ha	580 .0 ha
Reservoir area in dry season	0.90 ha	2.0 ha
Storage Volume in dry season	about 10,000m ³	about 40,000 m ³
Inhabitant Fish	Chambo, Catfish (Mlamba)	Chambo, Catfish
Dimba Irrigation	Active	Not active

(b) Groundwater

1) Borehole

According to the Hydro-geological Department, Ministry of Works and Water Development in Blantyre reported in July 2000, database of boreholes is now under preparing and there are no records for depth, yields, quality of water, etc. at each borehole. There are 480 boreholes in Blantyre district, 37 (7.7%) of them are broken and 1 well is dried up. Generally, a well yields 1 litter/sec on average with the minimum yield of 0.5 littler/sec. Groundwater level fluctuates in the range 2 to 3 m, higher in the rainy season and lower in the dry season. Consumption of water is estimated at 20 litter/person/borehole. There is not any monitoring well in Blantyre district.

On the other hand, there are 33 boreholes against 21,406 persons in MA villages. 7 boreholes (21%) are not working at present. Due to little yield of wells, boreholes are not used for irrigation. At 250 persons/ well in GOM, more than 53 boreholes are still needed.

2) Shallow well

As for shallow wells, people at northern part of MA use them for portable water while they are mainly used for irrigation over dimba fields along the perennial rivers, tributaries and dams but their numbers are few. Due to inundation during the flood season, villagers have difficulty to access to the boreholes at some places. It is found that groundwater is used for irrigation at Namingambo river basin which is located at the end of Chileka Dambo. About 10 farmers are engaged in vegetable cultivation at downstream of Milala Primary School and 5 at confluence point in Nkokozdi and Mamingambo rivers. They use groundwater for vegetable farming during the period from April to October by digging shallow wells in the river bed to irrigate land where rape, onion, Chinese rape, chilli, etc. are planted. During the harvesting season, farmers carry these

products for selling to Lunzu town either by foot or by bicycle. After harvesting the vegetables, rice farming is followed from November to March, taking advantage of inundation depth in 20 to 30 cm that prevails during January to March.

10.4 Current Land use

Land in TAs belongs to TA chiefs, but it has been distributed from village headmen to clan heads, and then to villagers as individual plots. Forests and brushes remain at cemeteries, steep hill side and rock outcrops. From aerial photo interpretation, rain-fed upland field accounts for 46.5%, or 1,780 ha. Wood lot, cemetery and hill side brushy area occupy 17.3% or 660 ha, followed by homestead yard and school ground accounting for 14% or 535 ha. Share of wasted land including rock outcrop comes to 11.4% or 440 ha. Dambo and dimba areas are totaled to only 1.6% or 60 ha as mentioned above. The remaining 9.3% comprises of roads, river beds and reservoirs. It follows that more than 60% of village land has already been allocated to individual households. (See Table 10.5.)

Salient features observed in current land use:

- 1) Rain-fed field includes about 15% of fallow land, used as firewood and thatch collection, or unutilized because of the remoteness from living quarter, or the land held by absentee landlords who live outside the village. Average arable land (Rain-fed, dimba field fallow land) is estimated at about 0.70 ha / household.
- 2) Woodlots are seriously degraded as a result of deprivation of firewood and charcoal material, with denuded canopy coverage of only 3 ~ 4%. Apart from woodlots, some upland plots have been planted with scattered mango (*Mangifera indica*) or malaina trees (*Gmelina arborea*).
- 3) Dimba cultivation is popular along perennial streams, in part of Chileka dambo and around reservoirs, though the total acreage is negligible. Dimba area is commonly allotted to as many households as possible giving chance to raise cash crops such as sugar cane and vegetables.
- 4) Around half of main stream banks are subject to river erosion or scouring, thus upright collapse of bank wall is observed in many places where precious river terrace deposits are washed away from dimba plots. This erosion is fostered by heap of riverbed sedimentation of run-off soils.
- 5) Boundaries demarcating village territory are not clearly marked either with stones, trees or other objects, thus causing disputes among village headmen concerned.
- 6) Gully erosion takes place along parcels with slope, inclined roads and foot-paths, sometimes developed into deep meandering ditches that wash surface soils away thus exposing rocks and stones.

Higher priority or urgency of implementing immediate measures lies in severely deteriorated tracts of land, however, it is essential to analyze first the current trends of land use as well to foresee future prospect.. Generally speaking, the southern part of the MA has been more seriously degraded due to higher demographic tension, but it is envisaged that this part will serve as a peri-urban housing quarters of Blantyre-Limbe in near future. Even though some environmental conservation measures were taken in this part, urbanization would make all such efforts in vain. Currently no particular national plan for a long-term land use has yet come into effect, firewood and charcoal are sold at higher prices in the zones where industrial enterprises and housing lots have rapidly been developed. This implies stronger demand for daily-consumed fuel and entailed risk of more tree felling.

Table 10.5 Current Land Use in the MA

No	T.A.	Village Name	Whole Village Area	Village Area located inside the MA						
				Total	Rainfed field	Woodlot	Dimba	Home- stead	Waste- land	Other land
1	Kuntaja	Gomez	90	37	12	9	0	7	8	1
2		Gomonda	43	13	3	5	0	2	3	0
3		Chakana	49	49	16	2	3	9	9	10
4		Mang'ani	293	59	23	15	4	8	6	3
5		Mdala	701	362	192	64	5	37	55	9
6		Kamtumbiza	900	60	30	10	2	7	5	6
7		Makanokaya	164	164	76	18	4	26	19	21
8		Chimseu Dzimbiri	71	31	13	7	2	5	2	2
9		Siyamdima	119	119	58	10	3	20	9	19
10		Kaumbata	316	316	176	88	4	24	8	16
11		Nanjiwa	234	197	97	78	3	12	5	2
12		Kammata	171	87	36	12	1	18	9	11
13		Kumanda	127	102	38	8	3	20	26	8
14		Daniel Mbedza	70	70	30	14	0	4	12	10
15		Chilangali	51	51	21	13	0	9	4	4
16		Tamvekenji	36	18	6	2	0	4	4	2
17		Lemu	349	349	145	93	4	57	24	27
18		Teula	127	127	55	15	4	15	14	24
19		Manjelo	69	69	23	10	2	6	20	8
20		Chikoja	233	233	115	28	3	36	30	21
21		Makanani	296	296	160	27	2	62	32	13
22		Salimu	134	134	67	14	2	20	21	10
23		Masangano	66	66	24	12	1	14	10	5
24		Michongwe	43	43	23	1	0	7	9	3
25		Magombo Ngondo	107	98	52	14	1	8	14	9
26	Kapeni	Kumponda	109	51	23	4	1	4	10	9
27		Peter Bilila	129	45	14	6	1	6	9	9
28		Maluwa	45	45	20	2	1	9	6	7
29		Kumisati								
29		Chigumula	89	45	15	8	1	9	4	8
30		Simon Mpombe	54	54	21	17	2	7	4	3
31		Kamwendo	315	315	152	27	1	62	51	22
32		Ndemanje	144	144	88	41	2	8	5	0
33		Kateyo	15	15	5	1	0	2	3	4
			5,759	3,864	1,829	675	62	544	450	306

10.5 Current Agriculture

(a) Introduction

Current conditions of agriculture in the MA and the RRA areas were identified through farm interviews of randomly selected farm households in the villages, as shown in Table 10.6

Table 10.6 Villages and No. of Households Selected for Farm Interview Surveys

Name of villages	No. of Sampled Households
Ndemanje	5
Michongwe	2
Kam'mata	10
Nanjiwa	4
Kaumbata	5
Total	26

Along with the farm interviews, a land survey on landholdings and planted areas was also carried out using a measuring tape and a compass. Nominal figures declared by farmers are too inaccurate to be used for planning as demonstrated in Table 10.7. Figures declared by farmers are 75% larger than actual figures, possibly because they do never have nor any need for a quantified concept of measuring land.

Table 10.7 Comparison of Nominal and Actual Figures on Upland Holdings, ha

No. of Sample	Nominal	Actual	Deviation, %	No. of Sample	Nominal	Actual	Deviation %
1	1.5	1.5	100	14	0.5	1.5	33
2	1.6	0.4	400	15	0.6	3	20
3	1.5	0.9	167	16	1	0.7	143
4	1.5	0.7	214	17	1.4	0.3	467
5	1.5	0.5	300	18	0.8	0.5	160
6	0.8	0.7	114	19	0.9	1.7	53
7	0.7	0.5	140	20	0.8	1.2	67
8	1.2	0.6	200	21	1	1.1	91
9	0.8	1.5	53	22	1.7	0.9	189
10	1	1.1	91	23	4	0.6	667
11	1.8	0.6	300	24	0.6	0.4	150
12	1.2	1.3	92	25	5.2	3.9	133
13	1	0.6	167	26	1.2	2.4	50
Average							175

Source: JICA study team, Aug. 2000

(b) Landholding

Farmers hold 1.181 ha for the MA and 1.274 ha for RRA area on an average as shown in Table 10.8. Holding per household includes fallow areas of 0.167 ha for the MA and 0.247 ha for RRA area, due mostly to the shortage of farm labor. Dimba is an irrigated land in dry season and is planted mostly with vegetables in dry season and rainfed in wet season for maize. Dimba is situated in alluvial low land and is relatively fertile. Dimba area held by a farm household is 0.071 ha for the MA and 0.094 ha for RRA villages. However, only 62 % and 54 % of the respective areas are cultivated due to the shortage of farm labor. Even though there are fallow patches, the size of landholding per household is too small to support relatively large family size of 6 members with agricultural production from single and rain-fed cropping per year without chemical fertilization.

Table 10.8 Landholding of a Farm Household, ha

		Model Area	RRA Area
Upland	Fallow	0.140	0.200
	Cultivated	0.970	0.980
	sub-total	1.110	1.180
Dimba	Fallow	0.027	0.043
	Cultivated	0.044	0.051
	sub-total	0.071	0.094

Total	Fallow	0.167	0.243
	Cultivated	1.014	1.031
	sub-total	1.181	1.274

Source: JICA Study Team, Aug 2000

(c) Crop Production

Crop is produced in upland and dimba. In upland, mixed cropping with maize, sorghum, groundnuts, sweet potatoes, tomatoes, cassava, pigeon pea and pumpkin is practiced in the areas. Average production of crops are 929 kg/ha in the MA and 978 kg/ha in RRA area as shown in Table 10.9. Maize is the most important staple crop in the areas. Most serious diseases and pests are mealybug and mosaic virus for cassava, grasshoppers for pigeon peas and weevil for stored maize. Cassava had been the most common crop grown in the area before 1982. But, after the spread of the cassava mealybug, no substantial cassava production has been made without effective measures taken. So most farmers are afraid of planting cassava which will inevitably be infested with the mealybug. The government is propagating resistant varieties, but their stalks have not yet reached to the farmers in the MA.

Table 10.9 Crop Production in Rain-fed Field by an Average Farm

Name of Crop	Production in kg		Mixed MA	Cropping ha RRA village	Yield in kg / ha	
	MA	RRA village			MA	RRA village
maize	551	621	0.72	0.70	765	887
sorghum	55	46	0.05	0.06	1,100	767
roundnut	44	54	0.04	0.04	1,100	1.35
sweetpotato	64	36	0.05	0.05	3,200	720
tomato	34	0	0.00	0.00	3,400	-
cassava	29	44	0.02	0.02	1,450	2,200
Pigeon pea	57	59	0.10	0.10	570	590
pumpkin	67	67	0.01	0.01	6,700	5,400
Total	901	901	0.97	0.98	-	-

A small amount of chemical fertilizers is applied to upland crops as shown in able. Dose of nitrogen applied from chemical fertilizers is calculated at no more than 8.36 kg/ha ($12 \times 0.23 + 8 \times 0.45 + 10 \times 0.2$) for the MA. Most of the chemical fertilizers are from the starter pack program, in which 10 kg of compound fertilizer and 5 kg of urea were given free to a household. According to the farm interview most farmers said they would not apply chemical fertilizers unless given free such as in the starter pack. Manure is from animal/ chicken droppings or plant residue, and their application rate is low, thereby has little value from an plant nutrient point of view. So, without the starter pack program, virtually any chemical fertilizer is not applied by the common farmers. Substantial yield increase would not be possible without applying chemical fertilizers.

Table 10.10 Fertilizer Application in Upland Field

	Application, kg		Application, kg/ha	
	Model Area	RRA Area	Model Area	RRA Area
Compound (23:21:0,4S)	11.9	12.9	12	13
Urea	7.9	10	8	10
Calcium ammonium nitrate(CAN)	9.6	7.1	10	7
Manure	85	132	88	135

Source: JICA study team, Aug. 2000

In dimba, vegetables such as tomatoes, mustard, Chinese cabbage and rape are grown to earn cash as well as for domestic consumption in dry season under irrigation. In wet season, maize is planted as shown in Table 10.11.

Table 10.11 Crop Production in Dimba by an Average Household

	Production, kg		Planted Area, ha		Yields, kg/ha	
	Model Area	RRA Area	Model Area	RRA Area	Model Area	RRA Area
Maize, wet season	25	32	0.044	0.051	568	634
Tomatoes	51	49	0.01	0.013	5100	3769
Pumpkin	44	54	0.003	0.005	14667	10800
Mustard	64	36	0.004	0.005	16000	7200
Chinese cabbage	34	44	0.003	0.004	11333	11000
Rape	29	44	0.005	0.009	5800	4889

Source: JICA study team, Aug. 2000

Fertilizers are applied relatively more intensively in dimba as shown in Table 10.12. Nitrogen from chemical fertilizers is applied at a rate of 19.64 kg/ha ($8 \times 0.23 + 11 \times 0.45 + 17 \times 0.2 + 45 \times 0.21$) in the MA. Manure is given at a high rate of 348 kg/ha in the MA. Most of the farmers, 65%, do not apply chemical nor organic fertilizers to vegetables due to lack of money to buy fertilizers.

Table 10.12 Fertilizer Application in Dimba

	Application, kg		Application, kg/ha	
	Model Area	RRA Area	Model Area	RRA Area
Compound (23:21:0,4S)	0.54	0.43	8	5
Urea	0.77	0	11	0
Calcium ammonium Nitrate(CAN)	1.15	0.71	17	8
Diammonium phosphate	2.89	3.93	42	45
Manure	24	30	348	345

Source: JICA study team, Aug. 2000

Insecticides such as Sevin, Ripcord, Dimethoate and Daconil are applied to vegetables by some affordable farmers near Lunzu market, i.e. 23% of them.

(d) Animal Holding

Animal husbandry is not active in the MA in terms of meat/egg production and of supply of draft power. Big sized livestock such as cattle and pig with substantial economic value, is rarely kept by farmers as shown in Table 10.13 and Table 10.14. 5

Table 10.13 Animal-Holding by Farm Household

	Animal-holding, head	
	Model Area	RRA Area
Cattle	0	0
Goat	1.4	1.9
Chicken	8.7	8.5
Pig	0.2	0.4

Source: JICA study team, Aug. 2000

Theft is the most serious problem in raising big animals. Most farmers can hardly afford to purchase stock breed to begin with and they are afraid of keeping large size livestock and hesitate to start rearing. Fatherless families are most susceptible to theft damages. A case reported that a lady lost 8 cattle 1 year after the death of her husband. Young widowed families are most difficult to rear cattle and pig due to this security problem. Police is not reliable to protect their cattle. When cases are brought to the police, a policeman comes to make a report and ask for possible suspects. If no suspect can't be named, no further investigation is made. However, there is a big difference in big animal-holding among villages as shown in Table 10.14. Kaumbata

village is the most active village in big animal husbandry. This seems to be due to the positive activities of the community guard stationed in the village. But, these activities stopped since it inflicted casualties in protecting cattle from thieves. A farmer lost his fingers and no compensation was given to him. After this incident the community police organization was dissolved. Even under poor security conditions, some villages such as Kachakwala in Dziwe area along Shire river can sustain big cattle industry. Cattle owners there are said to have some miracle to change cattle into dogs and khola (place to keep cows at night) into ponds when thieves invaded into their khola.

Table 10.14 Animal-Holding by Village, % of farmers

	Ndemanje	Kam'mata	Nanjiwa	Kaumbata
Cattle	0	0	0	20
Goat	20	10	25	80
Chicken	80	70	50	100
Pig	0	0	0	40

Source: JICA study team, Aug. 2000

Chicken are the most common domestic fowl in the villages, but have repeatedly been suffering from the Newcastle disease almost every year. Once it occurs, it causes devastating damages to chicken. No farms have reported experiences in vaccination to chicken because no service is readily available. African swine fever is the most dangerous disease for pigs in the MA. In 1999 three pigs died of this disease in a sample farmer in Kaumbata village. The supply of vaccine against the swine fever falls short so pig keepers can't vaccinate their animals.

(e) Food Security

Maize is the main staple food of the people in the MA with annual per capita consumption is estimated at 91kg for a family of 6 members. Self-sufficiency of staple is calculated at 76 % for the MA as shown in Table 10.15.

Table 10.15 Self-sufficiency of Food in a Farm Household

		Production kg/year	Sale % of produce	Self- consumption kg/year	Purchase kg/year	Self- sufficiency %
Maize	Model area	551	1	545	236	70
	RRA area	621	2	609	228	74
Sorghum	Model area	55	0	55	0	100
	RRA area	46	0	46	0	100
Groundnuts	Model area	44	11	39	0	100
	RRA area	54	17	45	0	100
Sweet potatoes	Model area	64	6.2	60	0	100
	RRA area	36	5	34	0	100
Cassava	Model area	29	0	29	0	100
	RRA area	44	1	44	0	100
Beans	Model area	0.38	0	0	61	1
	RRA area	0.71	0	1	61	1
Pigeon peas	Model area	57	7	53	0	100
	RRA area	59	7	55	0	100
Pumpkin	Model area	67	10	60	0	100
	RRA area	54	6	51	0	100
Total	Model area	867		842	297	76
	RRA area	915		884	289	78

Source: JICA study team, Aug. 2000

Most farmers have to buy maize during the lean period from January to March. Food security of the area remain poor and many times farmers had to receive food assistance during famines caused by abnormal climates.

(f) Agricultural Credit

Only 11.5% of farm households borrow money. Others can't or don't borrow money for the following reasons. Only 3.8 % of farm households can use institutional loan such as loans for vegetable income groups guided by field assistants. It is noteworthy that 26.9% ((100- 11.5) x 0.304)) of farm households were rejected MRFC loans, which means that MRFC loan scheme is not functioning well in the MA. Loan scheme by NGOs are also not working substantially in the MA due to extremely low density of their offices in the area.

1	Afraid of borrowing money	47.8%
2	Rejected application by MRFC	30.4%
3	Loan office is too far to go	8.7%
4	Have enough money	4.4%
5	Do not have enough collateral	4.4%
6	Do not have guarantor	4.3%
	<u>Total</u>	100%

(g) Agricultural Marketing

As stated in the preceding section, the MA is a food deficit area. There is no substantial marketable surplus beside some crops such as vegetables and groundnuts. Farmers are practicing basically subsistence farming. Some farmers sell their surplus such as vegetables to markets in Lunzu and Mombo. Volume of marketed surplus are within head-on loading per day per household. Marketing within village is rare. Marketed volume of vegetables is increasing and their prices are kept low. Farmers sometimes have to abandon their produce if there are no buyers. Vegetable market in Lunzu seems to have a glut supply of the same vegetable species.

Farm inputs such as seed, fertilizers and chemicals are sold by private merchants in Lunzu and Mombo and ADMAC warehouses in Lunzu and Matindi. Farm inputs are transported on head. Animal such as cattle and pigs are traded by visiting animal vendors in villages.

(h) Farmer's Preference for the Development

Interviewees were requested to select the most wanted option for the development from the following options.

- | | |
|--------------------------------|---|
| 1. no need for any development | 11. draft power supply including agri-machinery |
| 2. irrigation | 12. telephone |
| 3. electrification | 13. afforestation |
| 4. cottage industry | 14. water supply |
| 5. roads/bridges | 15. soil conservation |
| 6. education | 16. water conservation |
| 7. clinic | 17. maize mills |
| 8. agricultural credits | 18. dairy development |
| 9. agricultural extension | 19. poultry development |
| 10. inland fisheries | 20. ADMAC market |

Irrigation development is the most wanted option by the farmers sampled in this survey as shown in Table 10.16. The next option is the clinics. Mills are also given high priority in the development by the farmers because milling requires long travels with heavy load to mills in Lunzu. Milling by mortars is a traditional method but requires long heavy work for women and material for wood mortar is depleted.

Table 10.16 Farmer's Preference in Development, %

item	%
Irrigation	46
Clinics	23
Maize mills	19
Water supply	4
ADMAC buying center	4
Roads/bridges	4
Total	100

Crops selected for irrigation are shown in table 10.17. Vegetables are most wanted by farmers followed by maize and paddy rice.

Table 10.17 Preference of Crop for Irrigation by Farmers, %

Preferred Cash Crop	Share (%)
Vegetables	49
Maize	23
Paddy	17
Sugar cane	3
Sweet potatoes	3
Groundnuts	2
Banana	2
Irish potatoes	1
Total	100

(i) Agricultural Economy

A survey on agricultural economy and food status was made in the MA, visiting 32 farm households in 26 villages to measure / identify field area and food storage, as well as to interview economic situation. All households do not have past records of farming nor any ledger, only the farming results of last season was obtained as basal information. Table 10.18 and Table 10.19 and Table 10.20 shows the summary.

Table 10.18 Income Sources of Farm Households

Type of income	Share of farm households (%)
No income from sale of produce	19
Only income from dimba	47
Only income from rain-fed products	9
Both from rainfed and dimba	25

Table 10.19 Significant Relationship between Income Factors

First factor	Arable land per farm	Income from vegetable sale
Second factor	Annual income per farm	Annual income per farm
Correlation coefficient	0.721	0.787

Table 10.20 Salient Survey Results Summarized in a Table

Item Surveyed	Max.	Mini.	Average	Remarks
1. Family member	10	1	5.0	
2. Farm labour (person)	5	1	2.5	
3. Cash earning activities			21	Mostly cash-crop garden, 2/3 of HH visited
4. Number of huts / cottages	4	1	2.1	
5. Number of parcels	4	1	2.1	origin: husband dowry 1 and land of wife 1
6. Area of cropped parcels	2.55	0.09	0.81	Mostly rain-fed and upland plots
7. of which, cash-crop garden*	0.154	0	0.02	320 sq.m / 20 producer households out of 32
8. Maize sown area %	100	70	88	Equivalent to 0.71 ha / household
Production in kg / household	4,000	50	670	Equivalent to annual ration for 3.3 adult men
Yield kg / ha			950	Hybrid varieties shows poor yield without manure
Household that sold			2	Almost all farms cannot afford to sell maize
Quantity of sale kg / HH	150	100	10	
9. Groundnut sown area%	30	0	5	
Cropped households %			17	53% of farm households grow groundnut
Production in kg / household	900	0	80	
Yield kg / ha			1,450	Shelled yield comes to only 1 ton or less
Household that sold			1	Basically home-consumed crop
Quantity of sale kg / HH	350	0	11	
10. Sorghum sown area %	20	0	7	
Cropped households %			20	Many farms plant it as drought insurance crop
Production in kg / household	400	0	220	
Yield kg / ha			1,010	
Household that sold			0	Only consumed at home as fermented drink
11. Cassava planted area %	20	0	3	
Cropped households %			9	Mealy bug gave serious damage
Production in kg / household	1,000	0	72	
Yield kg / ha			2,970	
Household that sold	600	0	9.1	Mostly home-consumed as paste staple
Quantity of sale kg / HH			4	Few pieces of tuber is sold for daily income
12. Pigeon pea sown area %	30	0	15	
Cropped households %			28	Most households grow it as protein source
Production in kg / household	500	0	65	
Yield kg / ha			520	
Household that sold			5	
Quantity of sale kg / HH	300	0	15	Mostly selling fresh green pea as relish
13. Sweet potato planted area %	20	0	2	Limited if grown in post-rainy season
Cropped households %			4	
Production in kg / household	150	0	9	
Yield kg / ha			1,340	
Household that sold			3	Deemed as cash crop, not food

Item Surveyed	Max.	Mini.	Average	Remarks
Quantity of sale kg / HH	120	0	2	supplement
14. Cash crop sown: tomato HH			9	Mostly rotated with other leafy vegetables
HH with Chinese rape			6	In most cases continuous crop
HH with rape, mustard, turnip			4	
HH planted Sugarcane			1	No ratooning, harvested in 9 ~ 12 months
HH with Pumpkin leaf (dried)			4	
HH with paplica and cow-pea			3	2 farms produce cowpea, 1 does paplica
15. Input: Maize seed kg / ha	40	12	29.9	84% of the farm HH use 10 kg of chemical
Groundnut seed kg / ha	248	54	152.0	fertilizers, average doze comes to 137kg/ha,
Pigeon pea seed kg / ha	40	4	10.5	but most fertilizers are applied to cashcrops.
Calcium Ammonium nitrate	1,000	93	195	Only 2 farm HHs don't apply any manure
Diammonium phosphate kg/ha	325	165	200	
Urea kg / ha	149	42	76	Compound fertilizer is used in 6% of total.
HH that received starter-pack			21	63% of the farm HH received starter pack as
HH that applied manure/dung	Dung 13	Residue9	21	Donation from government (fertilizer+seed)
HH applying pesti-fungi-sides			5	
16. Livestock Head/HH cows	20	0	0.9	Big animals are often stolen
Pigs	6	0	0.2	
goats	18	0	2.0	
Chicken and ducks	53	0	7.9	Chicken are most popular livestock on farm
turkeys	3	0	0.1	
doves	20	0	1.2	
rabbits	6	0	0.0	No Guinea fowl is kept in the sample HHs.
Households without animals			7	7 HHs don't keep any livestock (22%)
17. Animal sold/slaughtered cow	5	0	0.03	
pigs	2	0	0.1	
goats	4	0	0.53	
Chicken and ducks	20	0	0.09	
HH that didn't sell animals			17	17 HHs didn't sell any livestock (53%)
18. Theft taken place crops			3	
Theft damage of livestock			9	9 HHs suffered from theft damage (28%)
19. Cause of major crop damage	Locust 11	Mealybug 6	Stem-borer 2	Leaf blight 4, aphid and striga each1
Cause of livestock mortality	Newcastle 18			Newcastle damaged HHs count 18 (56%)
20. Annual income: total (MK)	44,200	600	5,738	Self consumed crop value comes to 4,768MK
Of which, sale of grain/tuber	1,800	0	488	So, a farm HH earns MK 11,500 per annum
Of which, sale of cash- crop	28,200	0	2,077	Cash crop earning is by far important

Item Surveyed	Max.	Mini.	Average	Remarks
Of which, farm labour wage	3,000	-2,000	107	
Of which, sale of livestock	30,000	0	1,865	
Of which, off-farm income	14,000	0	1,201	Brick-maker, herbalist, blacksmith each 1
21. off-farm vocation: HH/kind			12 HHs	Carpenter, tinsmith and employee, each 2
22. Annual expense: total	9,270	590	3,540	Firewood sale, pension, village head, each 1
Farm input purchase	2,900	0	678	Only 20% of expense is paid for input
Supplement food purchase	3,000	0	1,195	One third of expense for food supplement
House building / repairing	2,500	0	457	Only 4 HHs (13%) didn't buy food
Borehole maintenance fee	120	0	12	Housing and ceremonial expense follow
Maize milling charge	3,000	0	244	food supplement purchase.
Transport expenditure	1,650	0	105	Only 4 households (13%) could self-supplied
Health care expenditure	3,000	0	175	food by their own harvest from the area
Events / ceremonial expense	2,000	0	420	Equivalent to 0.19 ha / family member
Cloth/ kitchen utensil etc.	1,500	0	255	
23. HH that utilised farm credit			1	Most villagers are afraid of borrowing credit
24 Current desire: food reserve	9 HHs	28 points	Ranked 7th	
More labour force	6 HHs	23 points	Ranked 9th	
Acquiring livestock breed	5 HHs	24 points	Ranked 8th	
Engaged in vegetable garden	3 HHs	4 points		
More acreage for staple-crop	2 HHs	6 points		
Income generating activities	3 HHs	12 points		
Purchase of bicycles	6 HHs	18 points	Ranked 10th	
More availability of inputs	12 HHs	46 points	Ranked 2nd	Input availability is desired next to mills
Nearer maize milling place	15 HHs	59 points	Ranked 1st	Maize mill is most acutely desired
More extension service	9 HHs	33 points	Ranked 4th	
Acquiring business funds	7 HHs	24 points	Ranked 8th	
Organize group activities	2 HHs	9 points		
Nearer borehole well	11 HHs	41 points	Ranked 3rd	Nearer borehole is needed by villagers
Nearer clinic / hospital	8 HHs	32 points	Ranked 5th	
More firewood availability	12 HHs	31 points	Ranked 6th	Firewood is desired more than food itself

Agricultural economy in the MA has another salient features as tabulated below in Table 10.21 and this implies heavy dependence of farm households on cash crop (dimba cultivation) for cash income generation.

Table 10.21 Sale Pattern of Farm Commodities

Status of selling farm produce	Households	Share %
Farmers without any sale of products	6	19 %
Those selling only cash-crop from dimba	15	47 %
Those selling only upland grain / tubers	3	9 %
Those selling both upland & dimba crops	8	25 %
TOTAL	32	100%

As regards the correlation among the surveyed items, the Table 10.22 shows high correlation coefficients between area of farm parcels and total household income or sale of livestock, between total and livestock incomes, while negative significant correlation is found between farmland area and length of period under food shortage or amount of food deficit (significant at the level of 10%).

Table 10.22 Prominent Correlation among Agro-economic Factors

Factor 1	Farm area per household	Farm area per household	Farm area per household	Farm area per household	Income from vegetable sale
Factor 2	Expenditure for food purchase	Amount of food deficit %	Food shortage period (month)	Total annual HH income	Total annual household income
Corr. coefficient	- 0.501	- 0.450	0.502	0.712	0.787

As shown in the above table, only 13% of the studied households obtained sufficient staple from their own field (equivalent to 0.19 ha / member, or 0.95 ha / household). In this context, per-capita ration falls around 180 kg of white maize per annum according to the food balance sheet by FAO, while yield thereof stays at 950 kg / ha. From these figures it can be estimated that 900 kg is at least necessary to meet food requirement for a standard family size of the sampled households, or 5.0 persons. This amount is produced from 0.95 ha in the case of last crop season. If this area reflects current farmland fertility, 23 farm households (70% of the sampled households, the average holding comes to 0.81 ha) fail to hold the necessary farm area. Therefore, it is imperative to increase maize productivity by at least 17% of what was harvested in the last season.

10.6 Current Agroforestry

(a) Basic Understanding

Insufficient agroforestry practices have been attributed to contribute to the problem of poverty in the MA that is identified among the villagers in the course of RRA. Poverty is mainly caused by problems which constrain agricultural production in the MA, namely, low agricultural yields which in turn are caused by: low soil fertility, land degradation, soil erosion, overgrazing, deforestation, declining land holding, and erratic rainfall.

Examination of trees planted in farms indicates that the main agricultural problem, that is low soil fertility, but is not being addressed by the current agroforestry practices. Most of the exotic tree species such as Eucalyptus, *Melea azedarach* and *Gmelina arborea* are planted primarily for construction poles either for self-use or sale, or mango (*Mangifera indica*) which has been planted for fruit and firewood production. On the other hand, the indigenous trees are primarily retained at public yards or cemeteries only for shade.

(b) Current Status of the Agroforestry

Analysis of the current agroforestry practices in the MA is done in the context of agroforestry definition. A simple definition is that “ Agroforestry is any tree planting or retention in farms for multiple purposes such as firewood/construction wood, fodder, fruit, soil fertility improvement, environmental protection, soil erosion control and live fence etc.” Technically, to qualify them as agroforestry, there must be economic and ecological interaction between such trees and crops/animals. Hence pure woodlots not serving as shelter belt in farms falls within the category of forests while boundary planting and home compound planting for wind and shade among other purposes falls within the agroforestry realm.

Viewed from the above, village people in the MA have planted mainly exotic trees in varying quantities, itself a system of primitive agroforestry without any intention. Also a number of indigenous trees have been retained selected species in farms partly, at times through the effort of village headmen and in other cases, through farmers efforts. Unallocated land also has remnants of degraded natural vegetation left after widespread harvesting of wood for charcoal and firewood purposes.

Village people or village headmen have clear intention for practicing agroforestry aiming at improving land fertility, harvesting fruits, ameliorating eroded soil condition, etc. However, villagers' practices of agroforestry is prevented by expensive seedling cost, lack of fund for purchasing seedlings, or lack of implements and technology for raising seedlings, etc. The ADD, FRIM and other government agents and NGOs have plans for expanding agroforestry of their own or expecting support from donors.

(c) Active Agroforestry Project in the MA

MAFE, which is the only existing donor country's activity in the MA started at 1998 by USAID. It promoted vetiver nursery and development agroforestry at Michongwe village. The project is executing through Blantyre ADD for selection of village, formation of agroforestry practicing group, technical support, monitoring and evaluation, etc. Project cost is funded to the ADD and ADD to procure materials for the activities. The fund is also applied for transportation to those who are charged to the project at the village. Currently, produced trees and grasses, counting almost 20,000 seedlings, have been shared among almost 60 participants and planted in their farm land. Meanwhile the nursery does not produce vetiver grass and other agroforestry materials for the year 2000 because of lack of water resources. The project was initiated as a model of agroforestry and envisages to expand to adjacent three villages to Michongwe (Salimu, Masangano and Makanani) in compliance with the results of the practices in the model village.

10.7 Current Forestry

10.7.1 Status of Forest Resources

(a) Current Forest and Forestry in the MA

There is not any gazetted forest in the MA. There is, however, many remnant, scant and degraded indigenous forests in most of villages. Most of these forests are under the control of the village headmen as their property and are kept by them as unallocated land. In most cases, these forests are located on relatively poorer sites with rock outcrops because most of the useful land have already been cultivated at one time or the other.

The only substantial "Village Forest" is that of Chilangoma Hills that was started and accomplished by WB donation and RFOS extension activities in 1999. A belt of 20 ha at the base of the hill has been planted with eucalyptus trees after land clearance of whole vegetation. The rest of hill still carries remnant degraded indigenous vegetation. The area planted in 1999 was initially stripped entirely of natural vegetation and then planted mainly with eucalyptus. The land preparation similar to work with weeding and ridging, was practiced trying to minimize weed competition and also to prevent rat damage.

The MA once had many diversified and large size trees before the current population settled the area. Historical evidence adduced during RRA survey indicates that there once existed large forests in the area. As per Table 10.23, the variety of tree species was quite large according to the inventory of trees during a transect tour of the villages.

The size of original vegetation can also be deduced from inventory of the vegetation in graveyards of the three villages. Other than the spots where people have been buried, the rest of vegetation in the graveyards have a part of and a true reflection of the original vegetation. Result of graveyard survey indicates an inventory of graveyards, indicating size of trees and number of stems per ha. Table 20.24 summarizes salient features of the graveyard vegetation.

Table 10.23 Indigenous Tree Species in Three Sampled Villages of the MA

Ndemanje Village		Nanjiwa Village		Kaumbata Village	
Local name	Scientific Name	Local name	Scientific Name	Local name	Scientific Name
1 Chinama	<i>Strichnos poptatorum</i>	Chan'dimbo	<i>Cssonia arborea</i>	Bwemba	<i>Tamarindus indica</i>
2 Chipakasa	<i>Cussonia arborea</i>	Chimama	<i>Strichnos poptatorum</i>	Chimama	<i>Strichnos poptatorum</i>
3 Chipembere	<i>Xeromphis obovata</i>	Chipembere	<i>Xeromphis obovata</i>	Chipakasa	<i>Lonchocarpus capassa</i>
4 Chitimbe	<i>Bauhinia petersiana</i>	Chiteta	<i>Bauhinia petersiana</i>	Chitimbe	<i>Bauhinia petersiana</i>
5 Kafupa		Chitimbe	<i>Brachystegia spiciformis</i>	Kapasule	
6			<i>Vernonia amygdalina</i>		<i>Strychnos spinosa</i>
7 Kakunguni		Chiumbu		Khope	
8 Kapasule		Futsa		Mateme	
9 M'bawa	<i>Khaya anotheca</i>	Kadyabusa		Matowo	
10 M'ngongomwa	<i>Azanza garckeana</i>	Kapasule	<i>Azanza garckeana</i>	Mchenje	<i>Sclerocarya caffra</i>
11 Matowo		Matowo		Mfula	
12					
13 Mkuyu	<i>Ficus capreifolia</i>	Mchenje		Mfungo	
14 Mlambe	<i>Adansonia digitata</i>	Mlambe	<i>Adansonia digitata</i>	Mlambe	<i>Adansonia digitata</i>
15 Mpoloni	<i>Steganotaenia araliacea</i>	Mlapesho		Mlombwa	<i>Pterocarpus angolensis</i>
16 Mpoza		Mombo	<i>Brachystegia bohemii</i>	Mphandula	<i>Bauhinia petersiana</i>
17 Msukamano	<i>Clerodendrum spp.</i>	Mpakasa	<i>Lonchocarpus capassa</i>	Mpoza	<i>Annona senegalensis</i>
18					
19 Mulombwa	<i>Pterocarpus angolensis</i>	Mphando	<i>Bauhinia petersiana</i>	Mvunguti	<i>Kigelia africana</i>
20 N'dyapumbwa	<i>Melia azadarach</i>	Mpolowoni		N'goza	
21 N'thetheth	<i>Acacia sieberana</i>	Mulombwa	<i>Pterocarpus angolensis</i>	N'ngongomw a	
22 Naphini	<i>Terminsria sericea</i>	N'khalagonkhoni		Naphini	<i>Terminsria sericea</i>
23 Nkalati		Naphini	<i>Terminsria sericea</i>	Nchenje	
24					
25 Nkotamo		Nc'chenje		Njenjeti	
26 Nkundi		Nkalati		Nkhalankhan ga	
27 Ntunda		Nsolo	<i>Pseudolachnostylis maprouneifolia</i>	Nkhunkhu	<i>Acacia garpinii</i>
28 Setanyani	<i>Steculia quinqueloba</i>	Ntangatanga	<i>Albizia versicolor</i>	Nkuyu	

Ndemanje Village		Nanjiwa Village		Kaumbata Village	
Local name	Scientific Name	Local name	Scientific Name	Local name	Scientific Name
29	Thombozi				
30	<i>Vernonia amygdalina</i>	Nthudza		Nsikidzi	<i>Piliostigma thoningi</i>
31		Numbu		Ntangatanga	<i>Albizia versicolor</i>
32		Phingo	<i>Dalbergia melanoxylon</i>	Nteme(Mate me)	
33		Thombozi	<i>Vernonia amygdalina</i>	Nthethe	<i>Acacia sieberana</i>
34		Thonga		Nthuza	
35		Tsamba	<i>Brachystegia spp.</i>	Ntondolo	<i>Cordyla africana</i>
36				Ntonongoli	
37				Ntumbu	
38					<i>Dalbergia melanoxylon</i>
39				Phingo	<i>Vernonia amygdalina</i>
40				Thombozi	

Table 10.24 Salient Features of the Graveyard Vegetations

Villages	Kaumbata	Nanjiwa	Ndemanje
Plot size used (ha)	0.03	0.02	0.04
Measured stems per plot	71	60	134
Stems per ha	2,261	3,000	3,350
Average Diameter (Dbh: cm)	8.8	8.2	5.5

(b) Villagers' Understanding in Forest through RRA Survey

Though degraded forest condition has not been understood as major problem or root causes poverty by villagers, a "natural resource degradation" was nominated at Nanjiwa village and "deforestation" is listed at Ndemanje village through the Problem Analysis as primary causes of poverty. Kaumbata and Ndemanje villages are considering that a natural resource degradation makes primary effects on the core problem also. Regarding firewood shortage, also Kaumbata and Ndemanje village put it as second cause to the core problem of poverty.

(c) Tree Nursery in the MA

In the field firewood consumption survey, farmers were asked the source of planting materials. In nearly all cases, farmers who have planted eucalyptus trees obtained their tree seedlings from Chilangoma tree nursery. Five villages namely, Lemu, Gomeza, Kuntanja, Gomanda, and Mang'ani have that own nursery adjacent to the nursery at Chilangona. Only in one occasion did farmers mentioned that they got planting materials from other farmers.

The number of tree nurseries is very few in the MA. At the time of field survey, there was only one substantial tree nursery, namely Chilangoma tree nursery which had produced about 51,000 tree seedlings in year 1999. Produced tree species are 43,650 seedlings of Eucalyptus, 2,300 of *Faidherbia albida*, and 5,050 of *Azelia quanzensis*. The WB supported the nursery activities through MASAF for afforestation of Chilangoma hill. They found no tree seedling at the nursery at the time of visit (29/6/2000).

Lemu village next to Namingamba River also has their own nursery as a part of Chilangoma tree nursery, in a

small plot of 10 m by 7 m. Out of 51,000 tree seedlings of Chilangoma nursery, 6,408 were produced in this nursery in 1999. In Ndemanje, at the time of RRA, there were two seedbeds, one belonging to Nasonjo Primary School while another one belonged to the village headman. There was no tree seedling due to lack of planting material, seeds and poly- tubes had not been supplied by the RFO(S).

A private tree nursery is located at Chikoja village. With a plot of 25 x 5 m. The site is however currently being used for vegetable growing. The farmer, however, showed the team the many planted eucalyptus trees in the adjacent fields, which were raised and transplanted from that tree nursery site.

(d) Forestry Technology in the MA

There is no sustainable forestry technology in the MA, which cause the exploitation of forest at the disposal of needs of villages as well as lack of efforts of knowledge for preserving viability of forest. In such case afforestation or tree planting activity by the villagers are far from sustainable one. Villagers practice it based only on supplied seed, vinyl pot, water can, etc by donors through RFOS and stopped after they run out of those material supply.

10.7.2 Demand for Wood

(a) Villagers Demand for Fuelwood and the Forests

Quantitative data of wood consumption were collected regarding fuelwood for cooking and cottage industries, which are the main consumption sources of woods in the MA. That data were collected by direct measuring methods with weight scale. The related data are the following:

- Firewood for cooking located near their residential area
- Firewood for cottage industries, i.e. charcoal burning, cake baking, beer making
- Firewood for sale
- Timber production for pole, window and roof frame, door, table, chair, etc. for house
- Timber for cage and fencing of domestic fowl and livestock
- Improvement of soil fertility of agricultural land
- Vegetation for Guinea fowl
- Fodder tree for livestock
- Materials for cottage industries, i.e. bamboo goods, bee hive, etc.
- Nectar tree for apiculture
- Shade for resting and conservation graveyard environment

(b) Survey on Consumption of Firewood in the MA

Firewood for domestic energy is the main use of wood in the MA. Deforestation and natural resource degradation in the area has been attributed to firewood harvesting and charcoal production. Firewood is used as the only source of energy for cooking and cottage industry in the MA. A survey of firewood consumption was therefore undertaken in the area to give an indication of the per capita consumption of firewood for planning purposes.

Charcoal is occasionally produced from remnant indigenous vegetation in the area, primarily for commercial purposes. Such charcoal is sold to charcoal dealers who in turn transport it by bicycles to Lunzu and other urban centers either in bags of 36kg or in small retail bags of 5kg. Firewood is also harvested and transported

and sold in urban centers as one of the income generating activities in farms.

During harvest season, use of firewood is supplemented by crop residue that should ideally be retained in farms to improve soil fertility. Use of crop residue is naturally not very popular as it burns fast and people cannot attend to other duties while cooking in view of the fact that such they have to constantly keep on feeding the stalk to fires. Large quantity of it is required, necessitating use of all the residue in most cases. Availability of such crop residue is dependent on the type and quantity of crop harvested.

(c) Survey Methods

Preliminary investigation of energy consumption in the MA indicated that nearly 100% of household relied on firewood. The only other form of energy used in the area was kerosene used for lighting purposes only. Based on that preliminary survey, a simple questionnaire was made and the contents as follows:

In each village, 10 households were randomly selected. For the three villages, a total of 30 samples were surveyed. Statistically, reliable inferences can be made from 30 samples where population variation is not expected to be great. The three villages are representative of the MA and information obtained can be extrapolated for the whole population in the MA. (see Annex II-C-2)

Other social studies may take a household as a group of family members living in the same home compound with one senior person who makes decisions on farm resources. For this firewood consumption study, a household is a family that cooks separately. Hence a daughter who is married or single mother who had separate houses and cooking facilities from that of mothers in the same compound were regarded as separate households for the purposes of firewood consumption. Efforts were however made not to sample more than one household from each compound.

The reason why we needed to know the wood consumption data was explained to sampled households by the counterpart staff. People were free with information and they are well versed with issues of firewood, including tree species commonly used and the duration of such firewood. It is the housewives who provided the information because they are the ones more familiar with issues of wood collection and use than men.

It was quite common that the firewood available in homestead was very little or in some cases almost none. It was therefore deemed necessary to measure a number of head-loads for people returning from the fields before use. People knew how much such wood would last. In cases where there was some wood remaining in compounds, such firewood was tied and measured by a spring balance and weight was recorded. The sampled household was then asked the number of days such fetched firewood lasts before going to fetch some more in the field.

As for kerosene, most people don't know what one liter means. Hence, information on the quantities of kerosene consumed was indirectly obtained from the content of, for example, soft drink bottles i.e. Coca-Cola bottles (about 300ml). In other cases, 250ml bottles were used or other retailer measurements. In other cases only the price paid was known. Local prices per unit volume were obtained and this enabled computation of the amount of kerosene used in measurable volumes.

Count of all planted trees in farmstead was also made. In most cases, these were the exotic tree species planted around home compounds.

(d) Domestic Energy

One major issue is that wood consumption is indeed not synonymous with wood demand. The amount of firewood consumed partly depends on wood availability. When the resource is very scarce, the amount of consumption is below that required for a fair standard of living. When the wood resource is abundant, people tend to abuse it and consumption figures are typically high. Assuming the moderate wood availability one must calculate approximated firewood demand.

One main observation in the field was that the trees planted in various homesteads are not targeted for firewood. Such trees were primarily used as poles for house construction and as a source of cash from sale of poles. Only *brachistegia* out of such trees was used for firewood usually at the time when such trees were felled for other purposes (The bark of this tree is also useful as a rope material to bind bundles etc.)

Sources of tree seedlings for the planted trees in their farmsteads were asked in the questionnaire. Invariably, most people obtained their tree seedlings from the tree nursery at Chilangoma Hills. In one instant, a farmer, Patricia Grey mentioned that her father obtained all the Eucalyptus in her farm (about 300 trees) from an individual farmer, Mr. Peter Masaba in Ntenjele village.

(e) Cottage Industries

In addition to domestic energy, firewood is used for a number of cottage industries in the MA. The main uses are those of brick making, brewing beer, spirits, maize cake baking, pottery, smoke fish, etc. Brick making requires bigger sizes of wood than normal cooking. For this very purposes, a number of mango trees have been pollarded to produce firewood for brick making. Some of the bricks are for self use while other are made for sale.

Pottery is also commonly practiced. Pottery making does not require large pieces of wood. In fact, small branches and grass have been used for burning pots which in very limited quantities. In some instances, a few families reported that they use larger quantities of firewood than other families because they also smoked fish for sale. There is no tobacco growing in the area, a cottage industry which would otherwise require considerable amount of wood for curing tobacco at farm level. Tobacco curing requires bulky and indigenous species of firewood.

It was also mentioned that about 20 % of family brew local beer and quantities of firewood consumed for this purpose is quite large. In fact, a few farmers whose consumption of firewood was found to be unusually high were also engaged in brewing of sweet beer and “Kachasu”.

(f) Firewood Consumption

Result of 30 sampled survey indicates the following. Respondents did not know how much wood they consumed when asked in form of long periods such as month, let alone annual data. Annual per capita consumption was hence obtained through computation of data based on weeks and days. From the computed data, average annual firewood per capita consumption was found to be 219kg³² for cooking use as home energy. Meanwhile it was identified that 298kg of firewood was consumed in the families practicing IGAs, i.e. brick making, smoked fish preparation, or brewing local beer, kachasu (local spirits), etc.

10.7.3 Current Activities on Natural Resources in and around the MA

(a) The WB Donation for Afforestation

The WB accomplished an afforestation of Chilangoma Hills located at south-west corner of MA in the year 1999. Fund was donated through MASAF to 4 of villages that are located partly or entirely located inside the MA. Whereas, Lemu village itself is located in entirely different area with Chilangoma hills. See Table 10.25.

³² Though most of measured firewood was air dry, a number of bundles measured were green wood.

Table 10.25 Chilangoma Bare Hills Afforestation Project

Village name	Afforestation Area (ha)	Cost of Chilangoma Hills Afforestation Project
Mang'ani	4.0	
Gomanda	2.5	<u>MK1,800,000</u>
Gomeza	4.0	(unskilled labor cost MK1,400,000)
Lemu	4.2	

This afforestation project was already completed and no further afforestation is planned by the WB in the MA. Two afforestation projects are planned but in and out the SA at middle shire in 2001.

10.8 Income Generating Activities (IGAs)

(a) Present IGAs Conditions in MA

The inhabitants in the MA have been engaged in various income-generating activities, though they are confined in a limited scale. Since farm households constitute the majority, most of these activities are related to such primary industries as farming and animal husbandry. Generally found are vegetable production and sale in dimba (marshy garden where perennial watering can often be done), rearing of chicken and other fowls, fattening and sale of goats and other small livestock, cottage manufacturing of mats made of bamboo or hydrants, basket weaving and sale etc, all in small scale.

1) Vegetable production/sale

Vegetable production and sale are based on cultivation of dimba, or small scale plots reclaimed along perennial small streams where mustard, Chinese cabbage, tomato, rape, amaranthus, pumpkin and others are raised. Farmers try to cultivate as many small-sized plots as possible, and mean size of a plot has rectangular shape of 15m and 8m, or 120 square-meter. Such dimba cultivation is observed in around a half of the villages in the MA where perennial streams run through or beside. They carry what they produce on their head by themselves to nearby markets, where they retail it by themselves. The only daily opening market accessible to them is Lunzu Market, located at a distance of 7 to 12 km from their villages. Farmers generally commute to their markets on foot, and very few of them use bicycles. Recently, competition among them has tended to become ever harsh because more vendors come to the markets with the same or similar products due to lack of diversification.

2) Livestock & small-scale fowl rearing

Animal husbandry constitutes rearing of chicken, dove, ducks, turkeys, goats and swine. Although cattle are kept by the farmers, many of them has been declining with higher risk of theft damage. Even chicken, the most commonly found ones, are reared by as few as less than one fowl by each family member, on average. Other fowls and small ruminants have been kept by a few farm households without any expansion trend because of their sedentary nature or low affordability. Farmers sell their livestock to local traders for cash earning, while very few of them bring their livestock to cattle markets, since the number of head / fowls they kept is quite few.

3) Home industry

Manufacturing of mats, baskets and farm implements has been a traditionally descended vocation, and they are sold directly to user farmers who live in the same or nearby villages. The size of manufacture is always limited because of limited demands, readily available everywhere and long lasting in nature.

4) Fish farming

Other means of income generation consist of fish-farming, by a few villages located around Milala dam and Ntenjela dam, that were constructed in 1960s. However, fish are not fed or reared but spontaneously proliferated and the farmers fetch them once or twice in a year for their income source.

5) Bee-keeping

Apiary has been practiced in Ndemanje village, located in the south of the MA, where honey-bees are kept in traditional type of comb containers. They produce honey and sell it in nearby markets. The production has been done in a limited scale due mainly to limited honey plants as sources of nectar. The bee-keepers make efforts to expand their bee-herds through the planting of new nectar sources.

(b) Government Supports to IGAs

1) MAFF and related institutions

EPA

EPA has been rendering extension activities to these villages to enhance agricultural production under the auspice of MAI, as a supporting action from the GOM. However, an FA, working for EPA as an extension worker, must cover more than ten villages and covering such vast area with satisfactory extension service is evidently beyond one's capacity. Even if the extension strategy had been switched from individual visit to a target-group transfer, still FA fails to give sufficient extension service to those who require it. As a group-based activity, seed production of sweet potato (vine scions) and soybeans has been introduced under the instruction of the extension workers. Since fund should be provided for most income generating activities, extension workers act as mediators between farmers and MRFC, in parallel with instructing techniques to farmers' groups.

In the MA, several groups have initiated IGAs, including two groups for seed production mentioned above and five others for vegetable production as well as for improving livelihood. The two for vegetable production have borrowed funds from MRFC. Other IGAs are mostly based on individual basis with acute shortage of techniques and starting funds. See Table 10.26.

MRFC

MRFC, privatized in 1996, lends IGA funds with fairly high loan interest rates with variable, volatile rate even for the short-term credits amidst lingering inflation prevailing in the country. Some farmers have fear of borrowing loans, as interests of short term ones are shifting from 37.5% to 45% or even to 52%. Offices of MRFC are located in the EPA buildings and they are most accessible to the farmers among other lending institutions. As a rule, collection of repayment by an extension worker is banned, but in some cases he is obliged to do so, often becoming a detested person among villagers concerned. By this reason extension workers become reluctant to instruct necessary techniques for IGAs in many places.

Table 10.26 Number of Villages with IGAs by Type

Group Village (Nr of Village)	Kuntaja (4)	Mdala (7)	Kam'mata (5)	Lemu (9)	Kumponda (8)	Total (33)
Seed Multi	1{1}	0	1{1}	1{1}	1{1}	4{4}
Vegetable	1	6	2	5{1}	7{2}	21{3}
Paprica	0	1{1}	0	0	0	1{1}
Fishing	1	1	1	3	0	6
Bee-keeping	0	0	0	0	1{1}	1{1}

Total	3{1}	8{1}	4{1}	9{2}	9{4}	33{9}
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Remarks: { }= Group Activity

Source: inventory survey by the Study Team

2) MOWYCS

Ministry of Women, Youth and Community Services also has rendered assistance for income generation activities through the group organizing by village. However, many of CDAs who were trained in soap manufacturing, bakery, mat weaving, furniture making and group organizing manuals, management and maintenance thereof etc. live in urban quarters of Blantyre. This alienated dwelling, far from their target villages, has become a great obstacle in giving services towards villagers. Consequently, no village was found where a group was established by CDAs in the MA.

(c) Storage and Primary Processing, etc.

Storage of agricultural products

Other activities practiced by villagers include livelihood / house-keeping improvement, such as food storage techniques, primary food processing and procurement of potable water. Harvested maize, or the staple food, is mostly stored with cobs in their granaries (nkokue) or in their rooms. As current production can hardly meet household demand, most villagers suffer from food shortage during rainy months from December to February.

Primary processing

Typical primary processing constitutes maize flouring, but only one maize mill is available in the MA (in Nanjiwa village). However, this mill is privately owned and not offering as public utility. Most villagers manually pound daily maize flour by themselves using pestles or pounding sticks and mortars. This provides village women with one of main daily chores. Primary processing also provides them with storable subsidiary foods like dried chips of sweet potato called “makaka”, those of cassava root and dried pumpkin leaves called “mfuso”, though few villagers are involved in such processing. Mango trees are abundantly found in the MA, and during rainy season their fruits are self-consumed as part of ration but the remainder is left rotten without any use for processing. No manufacturing of dried mango pulp is tried in the MA.

Bore hole

Potable and kitchen water is fetched from nearby borehole tube-wells, perennial streams or shallow wells by women. Boreholes are available in the MA at a rate of one borehole per village or so, but their distribution is not even and some villages do not have any well. These water sources are located often far from living quarters of villages, incurring heavy daily labor to villagers for fetching water.

Table 10.27 Number of Maize Mills and Borehole Wells

Group Village (Nr of Village)	Kuntaja (4)	Mdala (7)	Kam'mata (5)	Lemu (9)	Kumponda (8)	Total (33)
Maize Mill	0	2	0	0	0	2
Borehole	4	6	5	8	10	33
{shut-down}	{0}	{1}	{2}	{3}	{1}	{7}

Source : inventory survey by the Study Team

Borehole wells have been drilled by government agencies and NGOs, for which groups for their operation and maintenance are organized and management is instructed once they are drilled. A group called “borehole committee” operates and maintain a borehole, where in many cases monthly fee for the maintenance is collected from all the users at a rate of MK 5 to 10 per household. In other cases users pay MK10 each

whenever the borehole requires repairing. In most cases they are well maintained but there seems to be a case where users were reorganized in such a way as if the borehole were privatized for the use of privileged persons. As to well constructing materials, those made in India are recommended. Spare parts of hand-pumps for boreholes are sold in an urban wholesale chain stores called “Chipicle Shop”. The prices of these spare-parts have been boosting up under the recent inflation, leading to a standstill of borehole water supply because many users can not afford to buy the spare-parts even if it happens to get out of order. Table 10.27 show the number of maize mills and borehole wells.

Improved cooking stove

Three women in Ndemanje village had constructed a cooking stove different from the traditional three-stone at open fire place made of molded mud. They learned how to construct this type of stove from a schoolteacher when they attended primary school, but it was dismantled after a half year of usage due to rain damage. They said that they are going to re-construct again some because they can economize one fourth of fuel wood. Another example was found in Chimseu village where a widow lady lives alone, who made device of molding a small fireplace with clay. The fireplace has a round slit at the wall to put in small branches and a round mouth at the ceiling where cooking pans are put to heat. The owner said that it can economize fuel by half as compared with traditional three stove fireplace.

People in the MA have been suffering the shortage immediate fuelwood. According to the RRA survey, installation of improved cooking stove was mentioned as their needs. They have known the advantage thereof from the radio, but did not know how to make it. The advantage of conventional three stone fireplace should be incorporated into the proposed improved one in order to encourage the users to use the improved one. For example, the fuel feeding mouth should be either placed at the direction of predominant wind direction or it can be rotated to match windward, because if the mouth opens at leeward air cannot be blown into the inner part of furnace. Other device needed is to in the removable part of brick. In winter season, children can sleep well if they embrace stone taken away from three stone stoves which is still warm. The same function should be implanted into the improved one.

These circumstances may tell us that a CDA or NGO staff can introduce and diffuse the improved type under the following conditions.

- It should be constructed under a cover or shelter from rain.
- It should have similar function that the conventional three stone fireplace has, for example a part of the stove can be detached so that children can make their body warm during winter night.
- It can be molded with cheap and easily available materials abundantly found around their living quarters.

10.9 Current Village Organizations

10.9.1 Social Structure

In Malawi, rural societies maintain a traditional social structure based on the jurisdiction of the Traditional Authority. Traditional leaders are the TA Chief³³, Group Village Headmen³⁴ and Village Headmen. Their positions are fully incorporated in the official local administrative structure and they are entrusted to manage customary land, allocate land, set social norms and rules, mediate problems within the jurisdiction and coordinate affairs with other authorities. Their positions are succeeded from the previous Chiefs, Group Village Headmen or Village Headmen through the lineage system of the clan. For example, the TA Chief is always chosen from the same clan to which the particular chieftaincy belongs. When an incumbent Chief dies, elders

³³ Traditional leaders, whether it is TA Chief, Group Village or Village Headman, may be male or female. Although the word “Headman” is used in this section, it means “Headman or Head-woman”.

³⁴ Group Village Headman is the head of his own village as well as the head of neighboring Village Headmen under him.

of the clan would come together to select a new Chief from the same clan. The same succession system applies to Group Village and Village Headmen. Each traditional leader appoints his counsellors who aid and advise him on different issues concerning his jurisdiction. Counsellors are always chosen from people outside of his clan³⁵.

One of the keys to successful implementation of development activities in rural Malawi is to ensure that the TA Chiefs and village headmen/women understand the meaning of the project fully and lead the community in the planning and implementation by deploying their genuine leadership qualities. NGOs, which had been actively involved in the rural development in the country, commented that projects would likely fail unless the project earns the understanding and strong support from these local leaders. One of the NGOs shared their experience, in which their project failed by setting up a project committee without due consultation with the village headman, which created a division among villagers. Although no rivalries or conflicts were reported between different ethnic groups during the field survey in the MA, the rural society based on the clan system is inevitably not free from inequality among different ethnic groups and clans regarding such items as allocation of land. It has happened that the TA Chiefs and village headmen/women tried to bring the benefit to their own clans first when projects were planned or that handouts, which were to be distributed equally to the villagers, did not reach some of the families. It is therefore important to involve the local leaders at the early stage of the project planning and to include measures to build their capacity in leadership so that they can take a full part in leading the community with fairness.

Although this traditional social structure is still the basis of rural life in Malawi, the society is currently undergoing changes, which have been brought about since the onset of democratization process and multiparty system. In recent years the emphasis is to vest more power on democratically elected organizations, which is envisaged to co-exist with the traditional social structure. The formation of community organizations in rural areas is thus being promoted in line with this process. In principle, the Village Headman keeps an advisory position to most of the community organizations, which are formed by elected committee members.

10.9.2 Types of Existing Community Organizations

Different types of community organizations are found in rural communities. From the field survey in the 33 villages in the MA, all but 2 villages have at least one community organization and the majority have several with the average of 3 organizations per village. Community organizations, except religious organizations, found in the MA are listed in the Table 10.28.

³⁵ Please refer to ANNEX II-G.1 as an example of clan system.

Table 10.28 Existing Community Organizations in the MA

Organizations	Formation	Composition	Roles and Objectives	Funding Mechanism	Remarks
<p>Village Development Committee (VDC)</p> <p>10 villages / 33 villages</p> <p>(Under the new government decentralization policy, a nation wide District Development Planning System was introduced in 1997. This system aims to involve local people in the planning, implementation and management of their own development activities. VDC is the basic representative body in this system, normally organized at group village level.)</p>	<p>TA chiefs addressed village headmen to organize VDC. In some occasions MPs and other politicians also addressed the need. Some village headmen responded and formed VDC at village level or together with surrounding villages. Group Village Lemu and Mdala are trying to organize VDC at group village level but not yet fully developed.</p>	<p>It varies. For group village level, VDC is formed by representatives from member villages. For village level VDCs, normally 10 members (including chairperson, vice-chairperson, secretary, vice-secretary, treasure, vice-treasurer) are elected by villagers. For Kaumbata, as an exception, the committee is composed of village headman together with representatives from existing community organizations.</p>	<p>It is to facilitate development activities at village or group village level and mobilize communities to provide necessary inputs. Kaumbata and Kamwendo it is to oversee other committees. It is guided with self-help spirit. Some, such as Nanjwa, the committee started with a specific objective of building a clinic and later it has widened the scope.</p>	<p>When project is identified such as building schools and clinics, fund is normally sought through the line of Village Head - Group Village Head - TA - District Commissioner. Sometimes MPs are also approached. Community organize themselves to provide local resources and labour for implementation. However, in many cases no funding was secured from the district, which caused inertia or for one case dissolution of the VDC.</p>	<p>Organization of VDC is still a new concept and not yet fully developed in the MA. Some appear only nominal without concrete plans and activities. No member is trained. However, a few have demonstrated the success of initiating development projects and mobilizing villagers, especially those organized for a specific objective of building a clinic, improving school, etc.</p>
<p>Borehole Committee</p> <p>21 villages / 33 villages</p>	<p>Access to clean water is one of the most pressing concerns in the MA. In recent years different agencies have assisted in installation of boreholes. Upon borehole installation formation of committee is often facilitated by an executing agency such as NGO. Training (3-5 days) for committee members & VH on hygiene, and management and maintenance of borehole is sometimes provided.</p>	<p>Normally 10 committee members are elected from the borehole users (they may be from different villages). The committee includes chairperson, vice-chairperson, secretary, vice-secretary, treasurer and vice-treasurer. Some non-active or mismanaged committees were reported to have dissolved and new committees were elected.</p>	<p>Hygienic maintenance of borehole, supervising equitable use of borehole, provision of spare parts in case of break down, maintenance and repair of the borehole, collection of user fees are the main roles of the committee.</p>	<p>Committee members work as volunteers. Normally, fee is collected from the users to meet the cost of spare parts and repairs (5-10 MK/month/HH), but in some cases money is only collected when needed. Some BHCs have difficulty in collecting fees while others have no problem. The community usually provides local resources and labour for borehole installation.</p>	<p>Different organizations are involved. FWP and CU are prominent in the MA. In general, borehole committees with trained members are functioning well though they are only about two-thirds. Others are facing problems of maintenance and repair. Collection of user fee is a problem for poorer households and ill-organized BHC.</p>

Organizations	Formation	Composition	Roles and Objectives	Funding Mechanism	Remarks
Health Committee 14 villages / 33 villages	Two types of groups exist (see roles and objectives) but both are directed by District Health Office under the Ministry of Health. No training was given to HC members except one in Peter Bilila, who received one week training at Mlambe Hospital for how to weigh and screen children.	Selection of 10 committee members from villages around the clinic (type 1) or 10 members in the village (type 2). The committee includes same positions as those of borehole committee.	Type 1: Organized by villages around the mobile clinic. The committee often takes responsibility in cleaning the clinic, assisting the staff when it operates. Type 2: Organized at village level to promote health and hygiene among villagers, to distribute drugs at the time of cholera outbreak.	Committee members are elected by villagers and they work as volunteers. No fund is available. In Ndemanje and Peter Bilila, the committee cultivates soybeans and groundnuts to provide supplementary food to children.	Type 1: Active members are mainly from the village where the clinic is located. Type 2: Many appear not so active and some are only nominal. It is quoted that lack of training gives committee members little confidence and motivation to organize useful activities.
School Committee 9 villages / 33 villages PTA (Parents Teachers Associations) 6 villages / 33 villages	Directed by District Education Office under the Ministry of Education. No training was given to committee members. PTA is a relatively new organization compared to School Committee.	Selection of 10 committee members from the parents. The committee normally includes chairperson, secretary and treasurer. For the school committee the head master often holds a position as an observer.	School Committee is mainly for development of school infrastructure such as school blocks, teacher's houses. PTA mainly deals with students' disciplinary matters.	Both members work as volunteers. Upon request from school committee, parents usually provide local resources and labour for building school blocks and teachers' houses.	Moulding of bricks for school projects is common in the MA. Some school committees are eager to improve school infrastructure.
Farmers' Club 9 villages / 33 villages	Normally facilitated by Field Assistant, but voluntarily organized by group of farmers.	Formed by 10-20 farmers who have the same interest. In some cases they select committee members similar to other organizations but not always. 2 out of 9 Clubs are formed solely by women and other 5 Clubs have more women than men.	Farmers' clubs are often organized to obtain technical support from Field Assistant as under the recent policy extension work is targeted to organized groups rather individuals. For some, the sole purpose is to have an access to credit system (group loan).	Contribution from members or fixed membership fee is sometimes collected to meet the expenses for stationary, transport fee to contact Field Assistant, etc.	Main activities are seed multiplication of soybeans and groundnuts and vegetable cultivation. 3 clubs have obtained loan from MRCP. Due to its high interest rate (currently 52%) other clubs are not keen to apply. Many expressed need of alternative loan scheme accessible by resource poor farmers.

Organizations	Formation	Composition	Roles and Objectives	Funding Mechanism	Remarks
Village Natural Resource Management Committee (VNRMC) 8 villages / 33 villages (Guided by 1997 Forest Act, FD is trying to organize VNRMC in each village for participatory management of the village forest.)	Initiated by FD at village level. Theoretically, it follows the steps of sensitization of villagers, election and training of committee members. 4 VNRMCs involved in MASAF afforestation project were given leadership and forest management training (5 days).	Selection of 10 committee members from villagers. The committee includes chairperson, vice-chairperson, secretary, vice-secretary, treasurer and vice-treasurer.	Setting rules on the use of natural resources. Starting up or maintenance and management of village forestry. Fire protection. Developing tree nursery. Sensitization of villagers.	Committee members work as volunteers. No contribution from villagers. No fund, no resources except for donor-funded projects. MASAF projects provided all the tools and materials to start tree nurseries as well as it paid villagers for their work (15.8MK/day).	Except for funded projects training of committee members is not available. Lack of tools and materials (seeds, polytubes, etc.) is a problem for starting a tree nursery.
Dam Committee 3 villages / 33 villages (Lemu, Teula and Manjelo)	Initiated by Fishery Department in 1997.	Ten-member committee is organized by villagers from Lemu, Teula and Manjelo near Milala Dam.	Enforce rules for fishing and gardening around the dam. Actual rules and regulations are not yet set.	Profit from selling fish may be pooled for the committee, but not yet started.	So far no real activity has been organized, though the first committee meeting is planned in near future.
MAFE Committee 1 village / 33 villages (Michongwe)	In 1998 the committee was formed upon starting MAFE project (Malawi Agroforestry Extension), initiated by FA.	10 members are elected among villagers.	To implement MAFE project which targets soil conservation through adoption of agroforestry practices.	Project is funded by USAID through MAFSA.	The committee is active and succeeding in motivating villagers.
Water Committee 1 village / 33 villages (Michongwe)	In 1999 Village Headman initiated to form a committee.	10 elected members from the village.	To seek assistance to improve water supply in the village (installation of borehole).	Seeking assistance to Malawi Water Project.	It was reported to be not active.

Organizations	Formation	Composition	Roles and Objectives	Funding Mechanism	Remarks
Community Police 1 village / 33 villages (Nanjiwa)	7 villages (only one village in MA) discussed and decided to organize community policing as self-protection from increasing incidents of theft and robbery. No training nor support from the police.	Ten-member-committee is organized from 7 villages as main committee. Each village organizes a branch committee of 10 members.	To enforce security of the village. The branch committee organizes villagers to patrol the village at night. Villagers are only equipped with panga knives and hoes.	No funding. Act as self-help.	Incidence of theft and robbery is reported to have greatly decreased. Villagers regard the activity highly. Need of training and equipment are expressed by the committee members.
Agricultural Development Committee 1 village / 33 villages (Simon Mponda)	In 1998 the committee was formed with the support of FA.	Interested villagers (16 men and 3 women) formed the committee.	To adopt agricultural techniques under the supervision of FA. They also grow s/beans and g/nuts to improve nutritional status of the children by providing supplementary food in co-operation with the health committee.	They receive free seeds of s/beans and g/nuts from MAI.	Villagers regard the activity highly. The contribution of Ms. Banda, the FA, is well appreciated.

10.9.3 Constraints and Problems of Community Organizations

There are very few organizations, which were formed based on their traditional systems or formed spontaneously by the community to facilitate communal help. Most of the existing organizations were formed fairly recently, in the past few years, with the initiative and supervision of government agencies. Some are meant to function as the bottom-end of the receiving body for government directions and assistance, while others are directed to develop and manage resources locally in a self-help manner by the community. Some organizations are intended to fulfil both functions. Formation of community organizations aims to encourage participation of local communities for development activities and management of local resources. However, it was found that due to various reasons many of the community organizations are currently not functioning effectively.

(a) Historical Background: top-down approach

A long period of highly centralized and repressive socio-political environment under the previous government did not foster self-help spirit of the community. For example, the ownership of the community forest, which had been traditionally managed by the villagers with a strong leadership of the Village Headman, was transferred to the Forest Department under by the 1964 Forestry Policy. As a result, the community lost their power in managing and utilizing natural resources, which in part led to its neglect and degradation. Development activities were organized with top down approach. Villagers were made to participate in communal work, which was directed by the government and supervised by members of Youth League. During the 30 years of tight government control over people's lives, inertia grew among villagers, leaving little room for the community to take initiatives in managing local resources and taking charge in their own development.

Participation of local communities in development activities is still a new concept for many of the villagers, which was only advocated from the start of democratization process and the decentralization policy by the new government. Thus, for both the local communities and government agencies, the experience of forming effective community organizations has not yet accumulated. Poverty, low educational level of rural people, lack of exposure to new ideas and technologies, etc. are other factors, which hinder the process of community participation.

(b) Lack of Community Involvement

Some of the community organizations appear to lack involvement of the wider community. The formation of most of the existing organizations takes the following similar steps. First, government agencies, such as extension staff and health officers, contact the village headman and discuss the necessity of organizing a group for certain objectives. Then, the village headman calls for a meeting to discuss the subject with the villagers. If people agree on the importance of the issue, which is usually the case, they will elect committee members to facilitate the necessary activities. The committee is then left to work on the issue.

What is lacking in the above process is a process of sensitization of the community as a whole and opportunities for villagers to fully explore and discuss the issue as a community. For example, many villagers would see the benefit of organizing a Health Committee to improve health and hygiene status of the village and agree to elect a committee. However, at this stage very little discussion is facilitated on the subjects such as what are the causes of poor health and hygiene in their village, what measures would improve it, who could be contacted to obtain necessary information, what activities should be organized at village level, how they should be organized, etc. Instead people leave the issue to the elected committee without much awareness and expectation of what might be possible. In this situation even if the committee members are enthusiastic and well-trained, which is not often the case, it is difficult to involve the entire community.

(c) Lack of Training

From the discussion with different committees it was found that in most cases no training was provided for the committee members. An exception was the Borehole Committee. A fair number of Borehole Committees were provided with a training course on borehole maintenance and repair. For Health Committees on the other hand the majority received no training. Some members expressed that lack of training and basic materials (such as first aid kit, basic medicine, etc.) gave them little confidence and motivation to organize any useful activities. For VNRMC, no training was provided unless it was funded by donors. It is one of the reasons why many of the community organizations are inactive and failing to achieve their objectives.

(d) Lack of Funding Mechanism

Providing a sound funding mechanism is also important for community organizations to be sustainable. Most of the Borehole Committees collect user fees to meet the cost of maintenance and spare parts. Although some families are not able to pay regularly, many do pay the required fees, especially with a well-managed Borehole Committee. Some of the Farmers' Clubs also collect small member fees and contributions for the overhead expenses such as stationery and transport costs to contact extension workers. Apart from these organizations, no funding mechanism was provided. For many of the VNRMCs in the area, setting up tree nurseries is one of the initial activities necessary to launch, as rehabilitating village forest area and planting trees in and around the homestead are high priorities in order to meet fuelwood demand of households and to improve environment. VNRMCs, which are not funded from donors, are facing difficulties in obtaining seeds and polythene tubes as the FD is not currently capable of supplying the quantity requested from VNRMCs.

(e) Need of Effective Village Development Committee (VDC)

The formation of VDC has not fully taken place. According to the survey result, some type of "VDC" exists only in 10 out of 33 villages in the MA. 5 VDCs are organized at village level while the rest are formed together with neighbouring villages or at Group Village level. However, most of them have been formed very recently and are still in the process of identifying their roles and functions. None of the VDC members were trained nor given clear directions how to plan and manage development of the village. In most cases even the role of VDC is not well defined. The exceptions are VDCs in Kamwendo and Kaumbata villages where VDC is placed above the existing committees to monitor and co-ordinate those sub-committees as well as to discuss issues and solve problems brought by each sub-committee. VDCs organized at group village level (Group Village Lemu and Kuntaja) appear to be not functioning well as their existence was not known by most of the people of member villages as well as in some cases by village headmen.

10.10 Capacity Building and Education

10.10.1 Extension Service in the MA

In the MA, villages are supposed to be provided with extension services from forestry, agriculture, health and community development extension workers. In reality, however, a village with full support by extension service is found rare since extension workers visit only selected villages due to several reasons. In addition to that, it cannot be said that the quality of service is satisfactory. Even though the type and field of extension workers are different, their constraints lie in almost same points as identified through the RRA, which are summarized in Table 10.29.

1) Too many villages to cover by one staff

Since one extension worker sometimes has to cover quite a big number of villages as shown in the table

below, it is impossible to visit all the area under him. For example, one of the agricultural Field Assistant (FA) in TA Kuntaja has to cover 74 villages all by himself because one of his colleagues passed away and another one had retired, but no replacement has been made so far. Their areas simply became a part of his territory.

Table 10.29 Number of Villages Covered by Extension Workers in the MA

	No of village in MA	No of village to cover	Frequency of visiting RRA conducted village	Based at
TA Kuntaja				
Forestry				
Forestry Assistant	25	140	Never ^{*1} /Seldom ^{*2}	Chilomoni
Forest Guard	25	80	Never/Seldom	Kachakwala
Patrol Man (1)	10	21	Never/Seldom	Chilangoma
Patrol Man (2)	15	23	Never/Seldom	Mombo
Agriculture				
Field Assistant	25	74	Seldom/Seldom	Chilangoma
Community Development Assistant	25	31	Never/Never	Blantyre city
Health surveillance (1)	4	4	Sometimes/Sometimes	Within
Health surveillance (2)	3	3	Sometimes/Sometimes	Within
Health surveillance (3)	4	4	Sometimes/Sometimes	Within
Health surveillance (4)	5	5	Sometimes/Sometimes	Chileka SDA clinic
Health surveillance (5)	4	4	Sometimes/Sometimes	Mtengo wa Mbalame
Health surveillance (6)	5	5	Sometimes/Sometimes	Mombo
TA Kapeni				
Forestry				
Forestry Assistant	8	116	Seldom	Limbe
Forest Guard	8		Seldom	Lunzu
Patrol Man	8	18	Seldom	Lunzu
Agriculture				
Field Assistant	8	12	Frequently	Lunzu
Community Development Assistant	8	18	Never	Blantyre city
Health surveillance (1)	1	1	Sometimes	Gomani
Health surveillance (2)	4	4	Sometimes	Mkaimba
Health surveillance (3)	3	3	Sometimes	Mpira

Note: *1 is for Kaumbata village and *2 is for Nanjiwa village.

2) Lack of transport

Except for agricultural FAs who own push-bikes, extension workers have no means of transportation, so they take a mini bus or simply walk to reach their target village. Forestry Assistant and Community Development Assistant (CDA) mostly live outside of the area, and they have to pay their transportation fee from their own pocket. Some extension staff may easily decide to stay at the office rather than visiting villages spending transportation fee, and even if they decided to come, many of the villages are not reachable on foot from the main road where a mini bus stops. For the villages in remote area, chance is rare to be visited by extension workers under present condition.

3) Lack of training

Forestry extension service is provided by three kinds of workers namely Forestry Assistant, Forestry Guard

and Patrol Man. Because of the policy change in 1997; a shift of forest management from government base to community base, those who had never been trained or had bare training on forest management or extension methodologies were assigned as the extension worker. They have been working as extension workers without appropriate knowledge.

Even though many agricultural staff had recognized the importance of agroforestry, training availability on that issue at extension staff level is rare, twice or three times a year at EPA. Most of the training was given to upper level of staff rather than to the field level hoping that trickle down effect of knowledge. However, it has not been working because 1) there is a financial difficulty to provide such training to FA, 2) trained staff is engaged in various programs and has no time to train others, and 3) frequent personnel reshuffle move trained staff outside without teaching others.

4) No organized community

Under the new policy, extension workers are supposed to work with community based organizations rather than visiting individual households. However, because of limited number of staff, they are busy on working with existing groups and have no time to support community to organize new group. As a result, extension workers concentrates on the villages, which already have groups. Other villages are left out.

5) Poor participation of community members

Before the government used to supply input for free, and people are still expecting such kind of service from extension workers. They do not show interest unless extension workers come with starter pack or free vaccination for their livestock given to people. Because of past experiences, dependency syndrome is prevalent among people and they rely on the outside support such as free government service or a project with full support. Extension workers feel that participation of community is poor.

10.10.2 Needs of Extension Service

As a result of RRA survey, people's expectation for extension service was identified as follows.

(a) Intensive Support

During the RRA, it was identified that all three villages are willing to receive more frequent extension service. For example, Kaumbata village headman and villagers decided to organize VNRMC and recognize the advantage of forming a group to get support by extension service.

(b) Reliable Service

Farmers have been suffering incidence of pests and diseases on their agricultural production in the area. Villagers were complaining that even if they ask for assistance to the agricultural FA, their knowledge is not enough to teach them how to prevent such pests or diseases. On the other hand, people show their interest on agroforestry knowing about it from radio, but they could not start with no reliable extension worker. Villagers are seeking extension staff who have enough knowledge and technology to rely on.

(c) Easy Service

Because of the former policy that the government owned and managed resources such as forests, or the experiences of free supply of input to villagers, people's expectation for extension service is something to be given, in other word, they are just waiting for service without any active preparation from their side. They also believe that extension service should be provided individually rather than in a group. This happens because many villagers do not know that the extension service should be provided based on instruction to the

group rather than to individual and they should make an effort to organize groups. Especially for those who have disadvantage of accessibility, such as in village Kaumbata ,they have hardly been reached by extension workers and they did not know the necessity of forming groups.

10.10.3 Needs for Capacity Building

(a) People in the Area

People in the three RRA conducted villages learn many issues through non-formal and formal education. The former type of education, however, has been changing due to the influence of democracy, Christianity, western values and others. The chance of teaching important issues such as caring for forest resources, construction and management of infrastructure in the community, funeral ceremonies, etc. has become rare since number of initiation ceremonies and their participants or occasion of listening old generation's stories are becoming less.

In addition, a concern was expressed from many parents on the low quality of school education due to Free Primary Education since 1994. The system started suddenly with no preparation so that teachers, school materials and infrastructures could not meet the demand of sharply increased number of children, in terms of quality and quantity.

Not only for younger generation whose learning environment is degraded, but also adults have difficulties to learn necessary skills to earn a living. Though people in the MA are mostly engaged in agriculture, required techniques and information which could be obtained from extension workers has hardly reached as mentioned above.

At present, training courses for farmers are available at Lunzu Residential Training Center (RTC) and at EPA. Number of training course participants has been declining at RTC, 223 people in 1996/97 but zero in 1998/99 due to the financial difficulties and change in policy; providing extension service at village site rather than gathering farmers far outside of their area.

As for the training at Lirangwe EPA which covers the MA, number of participants of farmers training has been increasing; from 26,536 people in 1995 to 87,927 in 1999, however, participants tend to be selected from the area nearby. The MA is more than 20 km away from the EPA and not many people could join this training course (EPA boundary has been changed from July 2000, and since then the nearest EPA from the MA is Chipande EPA which is located at Lunzu RTC).

Training subject provided in 1999 at Lirangwe EPA is shown below in Table 10.30

Table 10.30 Training Course for Farmers at Lirangwe EPA in 1999

Trainer	Training Course	Number of Participants		
		Male	Female	Total
FA/FHA	Food and Nutrition	8,944	11,278	20,272
-do-	Group Dynamics	6,114	9,346	15,460
-do-	New Castle Disease Prevention	10,417	11,851	22,268
-do-	Tobacco Crop Management	612	203	815
-do-	Cotton Pest Control	715	289	1,004
-do-	Crop Rotation	1,751	2,977	4,728
-do-	Seed Multiplication to all Crops	426	274	700
-do-	Compost/Manure Making	10,397	12,333	22,730
	Total	39,518	48,595	87,927

Source : Lirangwe EPA

Note : FA; Field Assistant, FHA; Farm Home Assistant

Aside from technical training, the weak institutional structures or community based organizations would require mobilization and training on capacity building in terms of leadership skills, financial management, project and human resources management and other activities. People in three RRA conducted villages also expressed needs on capacity building for each kind of community based organization such as VNRMC and borehole committee. They feel that it is indispensable to have strong committee to carry out development activities successfully.

(b) Extension Staff

Almost all kinds of extension staff expressed the needs on some kinds of training including long term intensive training and short term refresher course during the RRA survey.

1) Forestry extension staff

Problems for forestry staff are serious. Forestry extension staff are consisted of three levels namely Forestry Assistant, Forest Guard and Patrol Man. Except for Forestry Assistant, the other two staff have been promoted without any appropriate training because of newly introduced policy of community based forestry management. Though they are supposed to mobilize community to organize VNRMC and provide the group or individuals with technical support, their capability is not ready yet to answer the request of villagers.

There have been strong request for technical training, but this has not been provided unless some kinds of projects are launched in their area, due to financial difficulties of the Ministry.

2) Agricultural Field Assistant

The FA went through two-year training course and have been provided fortnight training at each EPA. Major subjects picked at fortnight training are shown in Table 10.31

Table 10.31 Training Course for Field Assistant at each EPA in 1999

Trainer	Training Course	Number of Participants		
		Male	Female	Total
Government	Food and Nutrition	23	7	30
-do-	Seed Multiplication	23	7	30
-do-	Compost/Manure Making	23	7	30
-do-	Tobacco Crop Management	23	7	30
-do-	Cotton Crop Pest Control	23	7	30
-do-	Vegetable Management	2	2	4
-do-	Irrigation	2	-	2
-do-	Gross Margins	23	7	30
Total		142	44	186

Source: Lirangwe EPA

Though they are more equipped than other extension staff through these training courses, they still feel that training on important issues is lacking. For example, training on agroforestry has been provided for the staff of ADD or RDP, but not for Field Assistant who are the actual worker in the village level. The knowledge and techniques have not reached down to them, as mentioned above.

3) Other extension staff

Other extension staff available or should be available in the MA are Community Development Assistant (CDA) and Health Surveillance. Even though CDA is well trained on mobilizing and organizing community, they are not reliable since most of the staff live in Blantyre rather than based in the village. Many of them are wife of office worker who were transferred to Blantyre. Naturally, their mobility is limited with no transportation, and none of the villages in the MA are currently visited by CDA.

Health Surveillance, on the other hand, have about four or five villages to cover compared with other extension staff. Villagers feel that they are more visited by Health Surveillance compared with other extension workers. They have been providing information on sanitation, nutrition, cooking, family planning, etc. and medication in times of cholera or other diseases outbreaks but not good at mobilizing and organizing community, therefore they feel that villagers' attendance is low and it is difficult to gather people.