

**Environmental Management and Biodiversity Conservation of Forests,
Woodlands, and Wetlands of the Rufiji Delta and Floodplain**

**A Socio-Economic Profile of the Rufiji Floodplain and
Delta – Selection of Four Additional Pilot Villages**

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Rufiji Environment Management Project - REMP

Project Goal

To promote the long-term conservation through 'wise use' of the lower Rufiji forests, woodlands and wetlands, such that biodiversity is conserved, critical ecological functions are maintained, renewable natural resources are used sustainably and the livelihoods of the area's inhabitants are secured and enhanced.

Objectives

- To promote the integration of environmental conservation and sustainable development through environmental planning within the Rufiji Delta and Floodplain.
- To promote the sustainable use of natural resources and enhance the livelihoods of local communities by implementing sustainable pilot development activities based on wise use principles.
- To promote awareness of the values of forests, woodlands and wetlands and the importance of wise use at village, district, regional and central government levels, and to influence national policies on natural resource management.

Project Area

The project area is within Rufiji District in the ecosystems affected by the flooding of the river (floodplain and delta), downstream of the Selous Game Reserve and also including several upland forests of special importance.

Project Implementation

The project is run from the district Headquarters in Utete by the Rufiji District Administration through a district Environmental Management Team coordinated by the District Executive Director. The Project Manager is employed by the project and two Technical Advisers are employed by IUCN.

Project partners, particularly NEMC, the Coast Region, RUBADA, The Royal Netherlands Embassy and the Ministry of Natural Resources and Tourism, collaborate formally through their participation in the Project Steering Committee and also informally.

Project Outputs

At the end of the first five –year phase (1998-2003) of the project the expected outputs are:

An Environmental Management Plan: an integrated plan for the management of the ecosystems (forests, woodlands and wetlands) and natural resources of the project area that has been tested and revised so that it can be assured of success - especially through development hand-in-hand with the District council and the people of Rufiji.

Village (or community) Natural Resource Management Plans: These will be produced in pilot villages to facilitate village planning for natural resource management. The project will support the implementation of these plans by researching the legislation, providing training and some support for zoning, mapping and gazettement of reserves.

Established Wise Use Activities: These will consist of the successful sustainable development activities that are being tried and tested with pilot village and communities and are shown to be sustainable

Key forests will be conserved: Forests in Rufiji District that have shown high levels of plant biodiversity, endemism or other valuable biodiversity characteristics will be conserved by gazettement, forest management for conservation, and /or awareness-raising with their traditional owners.

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1 Introduction

In addition to the production of socio-economic profile of the Rufiji flood plain and Delta, the consultants were required to identify four additional villages for project intervention using the REMP criteria (Appendix 1).

Based on REMP criteria the following villages were identified to represent the four Agro-Ecological Zones (AEZ):

- Ndundunyikanza-West valley
- Chumbi B- Southern Delta with adjacent highlands
- Muyuyu njia nne-Middle flood plain
- Mfisini, Mchinga Salale-Northern Delta

It is important to note that in addition to the information generated through formal and informal discussions with the villagers, data obtained from the socio-economic survey were also used.

2 Ndundunyikanza Village

This village is located in the western flood plain along the Mkongo-Mloka road. In the western part, the village borders Kipo village, Selous game reserve is to the south of the village, Kisarawe District Borders the village to the north. To the east the village borders Ngorongo village. The distance from Mkongo junction to Ndundunyikanza is approximately 26 km. Discussion with villagers shows that the current Ndundunyikanza village is as a result of merging Ndundu and Nyikanza villages, during ujamaa villagisation. This village was chosen as a representative of the western flood plain. The village is far enough from the current intervention village of Mtanza-Msona; they are separated by 3 villages namely Nyaminywili, Kipogira, and Kipo. The location makes it easy for project interventions to diffuse to other villages in the western flood plain.

2.1 Representation of the village in Western Flood Plain

2.1.1 Ecology

The village is ecologically similar to other villages in the western flood plain. The main ecological characteristics, which are similar, include proximity to Rufiji River (fifteen minutes walk), near game reserve, surrounded by forests and woodlands, and presence of 'lakes' formed by the floods of Rufiji River. A comparison of the two villages included in the socio-economic profile from western flood plain (i.e. Mloka and Ndundunyikanza), the results indicate that there are no major significant differences with respect to major socio-economic characteristics such as age and household size.

Unfortunately, the team was unable to get the exact figure of the size of the village. Total population of the village according to the 1988 census is 3800 people in 300 households. There were no current population records in the village, which we could compare with the 1988 population census.

2.1.2 Natural resource use

The main natural resources available in the village are:

- Rufiji river: This is mainly used for fishing, provision of flood plains for agriculture on both sides along the river, water for wild life and navigation/transport.
- Lakes: Four lakes are available as a result of flooding of Rufiji River. These are
- Kimbisi located in the southern part of the village. This is used solely for providing drinking water. There are village by-laws, which govern the use of this lake.
- Kipilipili, Dete and Migwegweni lakes: These are not currently used for fishing purposes because of presence of water weed known as *mafufu* which hinder navigation
- Forests: Forests available in the village include Mfugalo, which is located to the northern part of the village. This is mainly utilised for firewood, building poles and timber. Available trees include *Mkongo (Afzelia quanensis)*-for timber, *Mininga (Pterocarpus angolensis)* –for timber and *Mpingo (Dalbergia melanoxylon)* for carving. Kikoyo forest is part of the Selous game reserve and is not utilised by the villagers. Other non-timber forest products available are *milala*, honey and ropes.

2.1.3 Economic activities

The main economic activities in order of priority are agriculture, fishing, forest products, and petty business.

Rain fed agriculture is undertaken at the flood plain and outside the flood plain commonly known as 'Baweni'. The main crops include rice, maize, cowpeas, sesame and cashewnuts. The main constraint to agriculture is crop losses due to wild animals, such as baboons, elephants and hippopotamus.

Fishing is mainly done in the river and sometimes in lakes. Fish species available include *kasa*, *kambale*, *kitoga*, *kumba* and *pele*. The main constraint in fishing is lack of improved fishing gear. The Fish populations are replenished annually by flooding of the Rufiji River.

Forests/woodlands provides a number of benefits to the villagers including building poles, thatch materials, making canoes, carving, timber etc.

Petty businesses including shops, restaurants, selling mats and baskets are also common in the village.

2.1.4 Ethnic mixes versus uniformity

Table 1 shows the distribution of respondents by tribe in Ndundunyikanza village. The majority of the population are ‘wandengereko’ (80%) and the rest are equally distributed (Table 1)

Table 1: Tribes of respondents in Ndundunyikanza

Tribe	Percentage of respondents (n=15)
Mndengereko	80.0
Mngindo	6.7
Mpogoro	6.7
Mkutu	6.7
Total	100.1

Source: Survey data (2000)

2.1.5 Social organisation

The basic unit of organisation is the household. The household has a head, normally a man even if he has more than one wife (exception is few female headed households). Labour division, decision-making and other organisations are part of the household responsibilities. Another level of organisation is that found at groups and village level. These are presented under coherence of the community and under the title ‘capacity’.

2.1.6 Wealth and poverty

There were no signs of excessive wealth or poverty. Normally people with businesses are considered wealthier. However, the quantities of durable assets can be regarded as a sign of wealth. The mean calculated assets index is 1876.88 compared to the survey area average of 3330.38 indicating that the average wealth of Ndundunyikanza is slightly more than 50% of the average wealth in the survey area of Rufiji flood plain and Delta.

2.1.7 Service delivery

There is one primary school in the village with about 315 children and five teachers. The average class size is 45 pupils. The village has no dispensary, instead they get this service from a nearby village called Nyamiywili. The village depends on Lake Kimbisi for water supply. There are strong by-laws, which ensure the preservation of this lake for domestic water purposes, for example washing clothes, destruction of the environment surrounding the lake etc. This shows that introduction of new by-laws for example of environmental conservation is likely to be accepted by the villagers.

2.2 Coherence of village community

2.2.1 Barriers to internal communication

Communication within the village is fairly easy. An earth road cuts across the village from the east (Mkongo) to the west (Mloka). The river is not a barrier to communication as people travel across the river using canoes.

2.2.2 Evidence of trust in leadership

There seem to be trust in village leadership as requests for meetings are made through the village leaders and many people tend to turn up in such meetings. The village chairman is Mr. Juma Shamte and the village executive officer is Mr. Saidi Kisatu. Perhaps the most interesting thing with the village leaders is that many are young, below 30 years of age. Discussions with various people tend to show that this is deliberate to give way to young generation in leadership.

There are various organised groups in the village including political parties. People mentioned the following groups in order of priority UDP (United Democratic Party), CUF (Civic United Front), UWT (women group of the Chama Cha Mapinduzi, CCM), Youth group of CCM, Mkongo Mloka Development Association (MMDA), Islamic groups and CCM. In addition, there are football teams in the village. The highly ranked one is Ndundunyikanza Rangers followed by the Black Wizard.

There are specific days of the week set aside for community development work.

The village government has 25 members of which six are women. Discussion with villagers shows that women are free to participate in any of the leadership positions, only that they do not stand for the highest posts. However, they feel that women are fairly represented in the village government. Women speak freely in meetings organized by the village government and estimates puts women attendance in meetings at 25% of all the participants

Regarding migratory habits the villagers pointed out that many farmers migrate to the farms during the cropping season. However, the planting of permanent crops in the flood plains makes some of the farmers to stay in their field permanently. The villagers did not want to link this with poor school attendance. They claim that children live permanently in the village and not in the farms. This necessitates the family to have two houses, which need to split the food items into two, let alone the people who are going to live with the children. This made us to believe that, there is a linkage between the migratory habits and school attendance.

There seems to be no conflict in the village. There is evidence of villagers working together on various tasks ranging from agricultural work to community related work. The later is stimulated when there is external assistance in works such as road construction.

2.2.3 Signs of enthusiasm and initiatives

In the village government, environmental issues are dealt with in the community development committee. As already mentioned earlier, there are by-laws which help to protect lake Kimbisi, giving an indication of environmental protection measures in the village. Tree planting around the village show peoples concern in the environment. However, no tree nurseries were observed in the village during the field visit. The villagers' assessment about the state of the environment ranges from bad (35% of the respondents to good and fair (50% of the respondents, Table 2). This assessment shows that at least one or two things should be done to the environment

Table 2: State of environment by village of residence (% of respondents)

	Mbwera (n=17)	Muyuyu (n=44)	Maparo ni (n=11)	Ndundun yikanza (n=14)	Chumbi B (n=14)	Mloka (n=15)	Mfisini (n=16)	Utunge (n=12)	Mgomba Kusini (n=22)	Nyamisi ati (n=10)	Total (n=175)
V. bad & getting worse	41.2	22.7	9.1		14.3	13.3	37.5	25.0	18.2	30.0	21.7
Bad	41.2	43.2	63.6	35.7	50.0	46.7	37.5	41.7	59.1	30.0	45.1
Good and fair	17.6	34.1	18.2	50.0	28.6	40.0	18.8	33.3	13.6	30.0	28.6
V. good & getting better			9.1	14.3	7.1		6.3		9.1	10.0	4.6

Source: Survey data (2000)

There have been changes in the environment, in many ways. Among them, expansion of agriculture and fish smoking has contributed to tree cutting. Tree harvesting for house construction, timber and

canoe building is common. During the socio-economic survey, the villagers indicated that it is not easier to get natural resources now as compared to the past (93.3% of the respondents, Table 3). This confirms the destruction of the environment as time passes. This was taken as a general expression on the concern of the environment

Table 3: Is availability of natural resources easier now compared to the past? (% of respondents)

	Mbwera (n=19)	Muyuyu (n=44)	Maparo ni (n=11)	Ndundun yikanza (n=15)	Chumbi (n=15)	BMloka (n=15)	Mfisini (n=16)	Utunge (n=13)	Mgomba Kusini (n=24)	Nyamis ati (n=10)	Total (n=182)
Yes	26.3	4.5	9.1	6.7	13.3	13.3	6.3	15.4	20.8%		11.5%
No	73.7	95.5	90.9	93.3	86.7	86.7	93.8	84.6	79.2%	100.0%	88.5%

Source: Survey data (2000)

Development initiatives were seen on an individual basis through various non-farm economic activities that were going on. Generally, the respondents indicated the need for improved crop and fish marketing and the markets of mats and other handicraft goods. This may be achieved through group/cooperative formation. However, no viable group/outsider development projects were observed in the village.

Attitudes to outsiders and the government are generally high. The group of researchers was well received during visits to the village. However, there are general feelings that the government has to assist the village more with development issues in which they are ready to contribute.

2.2.4 Accessibility

The village is easily accessible by road almost throughout the year. There is a daily bus from Mloka via the village through Mkongo. At Mkongo the road is connected to Kibiti and Ikwiriri. Travelling within the village involves the use of motorbikes, cars, bicycles and canoe when river crossing is necessary.

2.2.5 Capacity

We would say that there is a strong village government, which commands respect from the residents. No obvious mismanagement was observed in the village.

There is no major development project in the village, which draws people away from their daily routines. However, there are signs of accepting new development projects, which are geared towards the improvement of their production environment and markets.

2.2.6 Biodiversity

As already mentioned, the village encompasses several niches such as forests, lakes, seasonally flooding river, wildlife etc. in which people are interacting with. These necessitate interventions related to wise use and optimal interaction between people and their surrounding environment to enhance biodiversity already existing.

By-laws already exist in the village, for example, the protection of Lake Kimbisi, these can be extended to include Biodiversity protection. We were not able to identify any species of animal and plants, which are threatened. However, timber trees, which take a long time to mature, are likely to be threatened species in the area.

3 Chumbi B Village

This village is located in the southern Delta with adjacent highlands along the Ikwiriri –Lindi road. Coming from Ikwiriri just after the Ndundu Ferry there is a junction of the road leading westward to Utete town. The distance from Utete to Chumbi B is approximately 45 km.

In the west the village borders Kinjiranjira forest and Mbwara village. Mohoro is to the south of the village, Chumbi A village borders to the north. In the east the village borders Rufiji Delta South. Discussion with the villagers shows that the current Chumbi, A, B and C are part of the villages formed during the ujamaa villagisation, aiming at moving people to up lands away from the flood plains. This village was chosen as a representative of the southern Delta with adjacent highlands (inner delta south in finer AEZ). The village is far enough from the current intervention village of Jaja. They are separated by a series of Delta islands namely Mohoro, Ndundutawa and Ruma. The location makes it easy for project interventions to diffuse to other villages in the south delta.

3.1 Representation of the village in Southern Delta with adjacent highlands

3.1.1 Ecology

The village is ecologically similar to other villages in the southern Delta bordering the adjacent highlands. The main ecological characteristics, which are similar, include proximity to Rufiji River and delta, surrounded by forests and woodlands in the higher grounds, and presence of ‘lakes’ formed by the floods of Rufiji River.

As in other villages, the team was unable to get the exact figure of the size of this village. The village has 4 sub-villages namely Msikitini (central part), Mikolwa (southern part), Kilindi (eastern part), and Kipoka (south-western part).

Total population of the village according to the village statistics of 1999 is 1177 people in 232 households, (549 males and 628 females). People capable of working are 300 males and 349 females, the rest are the old, children and the disabled (Table 4). This is one of the villages that had proper population records. They are displayed in the village government’s office

Table 4: Chumbi B population statistics

Category	Males	Females	Total
Able to work	300	349	649
Adults unable to work	12	8	20
School going children	43	48	91
Children not going to school	193	221	414
Disabled	1	2	3
Total	549	628	1177

Source: Village data, 1999.

The table shows a bigger number of children who are not going to school. Although we did not get the population statistic age-wise, we suspect that there are number of pupils who were supposed to be going to school and are not doing so. This supports the discussion with the head teacher Mr Jackson Yese Jeremia that parents are difficult in taking their children to school due to strong Islamic madrasa and high school contributions especially for large family sizes.

3.1.2 Natural resource use

The main natural resources available in the village are:

- Rufiji river: This is mainly used for fishing, provision of flood plains for agriculture water for wild life and navigation/transport.

- Lakes: Two lakes are available as a result of flooding of Rufiji River. These are Lule: This is located to the northeastern part of the village. This is used mainly for fishing Kwambanda: This is also located in northeastern part of the village. It is also used mainly for fishing.
- Forests: The village is surrounded by forests and woodlands. The nearest forest reserve is called Kitalu, which borders village forests and woodlands. The main uses of forest are for firewood, building poles and timber. Available trees include *Mkongo (Afzelia quanzensis)*-for timber and *Mininga (Pterocarpus angolensis)* –for timber. Other non-timber forest products available are *milala*, honey and ropes. Bee keeping is not well developed. In addition to the above use, the village benefits from taxes emanating from the use timber harvesters.

3.1.3 Economic activities

The main economic activities in order of priority are agriculture, fishing, forest products, and petty business.

Agriculture is mainly undertaken at the flood plain and sometimes outside the flood plain depending on the rainfall of that season (rain fed agriculture). The main crops include rice, maize, cowpeas, sesame, bananas, pumpkins and cashew nuts. The agriculture in the flood plain is flood dependent (too much floodwater and too little floodwater are detrimental to agriculture). The main constraint to agriculture is crop losses due to wild animals, such as monkeys, baboons, elephants and hippopotamus. During the fieldwork the team saw one baboon de-roofing a house to get access to stored grains!

Fishing is carried out mainly in the river and in lakes. Fish species available include (in order of priority *Kambale, kumba, pere, kitoga, nguchu, ngasa, kange, beme and kogo*. The main constraint in fishing is lack of improved fishing gear. Fish stocks are replenished annually by the flooding of the Rufiji River. Low levels of flooding result in lower catches.

Forests/woodlands provide a number of benefits to the villagers including building poles, thatch materials, making canoes, carving, timber etc (as mentioned under 3.1.2).

Petty businesses including shops, restaurants, selling mats and baskets are also common in the village.

3.1.4 Ethnic mixes versus uniformity.

Table 5 shows the distribution of respondents by tribe in Chumbi B village. The majority of the population are ‘Wandengereko’ (93.3%) followed by ‘Wamatumbi’. According to the sample the ethnic group is almost uniform in the survey area.

Table 5: Tribes of respondents in Chumbi B

	Percentage of respondents (n=15)
Mndengereko	93.3
Wamatumbi	6.7
Total	100.0

Source: Survey data (2000)

3.1.5 Social organisation

As in other villages, the basic unit of organisation is the household. The household has a head normally a man even if he has more than one wife (exception is few female headed households). Labour division, decision-making and other organisations are part of the household responsibilities.

Another level of organisation is that found at groups and village level. These are presented under coherence of the community and under the title ‘capacity’.

3.1.6 Wealth and poverty

There were no signs of excessive wealth or poverty. However, the quantities of durable assets can be regarded as a sign of wealth. The mean calculated assets index is 2555.3 compared to the survey area average of 3330.38 indicating that the average wealth of Chumbi B is more than 70% of the average wealth in the survey area of Rufiji flood plain and Delta.

3.1.7 Service delivery

There is one primary school in the village, which was started in 1968. It currently has 352 pupils (male 182 and females 170) with eight (three male, and five female) teachers. The number of positions for pupils in the school is adequate for enrolling all the children in the village (of school going age). However, the problem of proportion of children who are not going to school is high.

The village has a dispensary, which caters for Chumbi A and B. It was constructed in 1968. The in-charge of the dispensary is Mr Geoffrey Mjanja, who said the dispensary is open for all. The dispensary is constrained by inadequate staff. Only three members of staff are available.

The village depends on shallow wells as the main source of water. The wells are easily contaminated during use and during flooding, made worse by the fact very few houses have latrines.

3.2 Coherence of village community

3.2.1 Barriers to internal communication

Communication within the village is fairly easy. An earth road cuts across the village from north (Ikwiriri direction) to the south (Lindi direction). The river is not a barrier to communication as people travel across the river using canoes and ferry at Ndundu. People can also travel to the Delta using canoes (closely following the tides).

3.2.2 Evidence of trust in leadership

There seem to be trust in village leadership as requests for meetings are made through the village leaders and many people attend such meetings. The village chairman is Mr. Mohamed Mpoli and the village executive officer is Mr. Shabani Mohamed. As noted in Ndundunyikanza village, village leaders are young (below 30 years of age). Discussions with various people indicate this was deliberate to give way to younger generation in leadership.

There are various organised groups in the village including political parties. People mentioned the following groups in order of priority Women group, CUF (Civic United Front), CCM (Chama Cha Mapinduzi), and madrasa/Islamic groups. In addition there is a football team in the village namely Chumbi International.

There are specific days of the week set aside for community development work. Among the work done is road and bridge construction under the assistance of Village Travel and transport Project (VTTP).

The village government has 23 members of which six are women members. Discussion with villagers reveals that women are free to participate in any of the leadership positions, only that they do not stand for the highest posts. Based on the number, women are fairly represented in the village government. There was evidence that women do not speak freely in meetings organized by the village government and estimates put women's attendance in meetings at only 10% of participants. The team was invited for lunch but we never saw those women who prepared the food! Women are more dominated by their husbands and discussion with some villagers revealed that some men tell their wives "I am going to the meeting remain at home".

Regarding migratory habits the villagers pointed out that many farmers migrate to the farms during the cropping season. However, the planting of permanent crops in the flood plains makes some of the

farmers to stay in their field permanently. The villagers did not want to link this with poor school attendance. They claim that children live permanently in the village and not in the farms. This necessitate the family to have two houses, which need to split the food items into two, let alone the people who are going to live with the children. Based on this it seems the claim is not true. This led us to believe that, there is a linkage between the migratory habits and school attendance. The head teacher of the primary school acknowledged children coming late to school because of the distance involved from the farms to the school. There seem to be no conflict in the village. There is evidence of villagers working together on various tasks ranging from agricultural work to community related work. The later is stimulated when there is external assistance in works such as road construction. In this case the presence of VTTP has mobilised the villagers to construct a bridge across one of the delta tributaries.

3.2.3 Signs of enthusiasm and initiatives

In the village government, environmental issues are dealt with in the community development committee. There are by laws which helps to protect forests and shrubs surrounding the village, giving an indication of environmental protection measures in the village. This shows peoples' concern in the environment at village level. However, no tree nurseries were noted in the village during the field visit. The villagers' assessment about the state of the environment ranges from good and fair (28.6% of the respondents) to bad (50%). About 14% of the respondents showed that the state of the environment is very bad and getting worse (Table 2). This assessment shows that there is serious need to consider the state of the environment

There have been changes in the environment, for many reasons. Among them, expansion of agriculture and fish smoking has contributed to tree cutting. Tree harvesting for house construction, timber and canoe building is common. During the socio-economic survey, villagers indicated that it is more difficult to get natural resources now as compared to the past (86.7% of the respondents, Table 3). This confirms the destruction of the environment as time passes. This was taken as a general expression on the concern of the environment

Initiatives for development were observed on an individual basis through various non-farm economic activities, and participation in VTTP programme. Generally, the respondents indicated the need for improved crop prices e.g. cashew nuts and fish marketing. This may be achieved through group/cooperative formation.

Attitudes to outsiders and the government are generally positive. The group of researchers was well received during the visits to the village. The presence and acceptance of VTTP project shows that outside projects which fully involve the local people can be accepted easily.

3.2.4 Accessibility

The village is easily accessible by road almost throughout the year. There are buses and lorries passing through the village from the southern part of the country to Ikwiriri and Kibiti on their way to Dar es Salaam (via Ndundu Ferry). Traveling within the village involves the use of motorbikes, cars, bicycles and canoe when river crossing is necessary or traveling to delta islands. The villagers complained about the availability of the within-village transport.

3.2.5 Capacity

We would say that there is a strong village government, which commands respect from the residents. No obvious mismanagement was observed in the village.

There is no major development project in the village, which draws people away from their daily routines. Only the VTTP project which, works with the villagers in a participatory manner. Beside this there are signs of accepting new development projects, which are geared towards the improvement of their production environment and markets.

3.2.6 Biodiversity

As already mentioned, the village encompasses several habitats such as forests, lakes, seasonally flooding river and wildlife, with which people are interacting. These necessitate interventions related to wise and optimal interaction between people and their surrounding environment to enhance biodiversity already existing.

We did not notice any threatened animal or plant species, however given the vast forest areas there may be such species.

4 Muyuyu Njia Nne Village

This village is located in the Middle flood plain (inner Delta North in finer AEZ). It is east of Ikwiriri town. It is connected to Ikwiriri by an earth road about 14 km. away. The road is passable.

To the west, the village borders Ikwiriri town and Umwe village. Mtunda village is to the northeast of the village, Rufiji River borders the village to south. This village was chosen as a representative of the middle flood plain.

4.1 Representation of the village in middle flood plain

4.1.1 Ecology

The village is ecologically similar to other villages in the flood plain. The main ecological characteristics, which are similar, include proximity to Rufiji River and delta, surrounded by forests and woodlands in the higher grounds, and presence of ‘lakes’ formed by the floods of Rufiji River.

Unfortunately, the team was unable to get the exact figure of the size of the village. The boundaries are known but the village has not yet been mapped. The village has seven sub-villages namely Muyuyu, Nyambele, Njia nne, Mkata, Msuguri, Magomeni and Sonyo.

We were not able to access the population data in the village. We suspected that there are no records. As a result, the only data available is the 1988 population census. Total population of the village according to the 1988 census is 2740 people. There is a need for strengthening record keeping.

4.1.2 Natural resource use

The main natural resources available in the village are

- Rufiji river: This is mainly used for fishing, provision of flood plains for agriculture water for wild life and navigation/transport.
- Lakes: Four lakes are available as a result of flooding of Rufiji River. These are Ndambwe: This is located to the southern part of the village. This is used mainly for fishing
- Pungu: This is also located in southern part of the village. It is also used mainly for fishing. Lung’ala: This is located to the southeastern part of the village. It is also used for fishing purposes. Lungole: this is also located in the south-eastern part of the village and is used for fishing Mbilingani: Located to southeastern part of the village. It is used for fishing. The fish populations of the above lakes are replenished during flooding of the Rufiji River.
- Forests: The village is surrounded by a number of forests and woodlands. The nearest big forest is Makotwa, which is located to the north west of the village. The forest extends near the village as you enter from Ikwiriri. The main uses of forest are for firewood, building poles and timber. Available trees include *Mkongo (Afzelia quanzensis)*-for timber and *Mninga (Pterocarpus angolensis)* –for timber. Other non-timber forest products available are *milala*, honey and ropes. Bee keeping is not well developed. The village also gets income from timber sawyers.

4.1.3 Economic activities

The main economic activities in order of priority are agriculture, fishing, forest products, and petty business, mat making and pottery.

Agriculture is mainly undertaken in the flood plain (Yambele area near the Rufiji River) and sometimes outside the flood plain depending on the rainfall of that season (rain fed agriculture). The main crops include rice, maize, cassava, sesame, pumpkins and cashewnuts. The agriculture in the flood plain is flood dependent. The main constraint to agriculture is crop loss due to wild animals, such as monkeys, wild pigs, baboons and hippopotamus.

Fishing is undertaken mainly in the river and in lakes. Fish species available include *nguchu, kambale, kitoga, kumba, kasa, kange, beme, kogo and pele*. The main constraint in fishing is lack of improved fishing gear.

Forests/woodlands provides a number of benefits to the villagers including building poles, thatch materials, making canoes, carving and timber.

Petty businesses including shops, restaurants, selling mats and baskets are also common in the village

Mat and pot making are normally the job of women mainly for domestic use and a few for sale.

4.1.4 Ethnic mixes versus uniformity.

Table 6 shows the distribution of respondents by tribe in Muyuyu Njia nne village. The majority of the population are ‘Wandengereko’ (72.7%) followed by ‘Wangindo’ (13.6%) (Table 6). Other small tribes are itemised in table 6, the pattern is of ethnic tribes mixed with one major tribe (i.e. ‘Wandengereko’).

Table 6: Tribes of respondents in Muyuyu Njia Nne

	Percent of respondents(n=44)
Mndengereko	72.7
Mngindo	13.6
Mmakonde	2.3
Mmatumbi	2.3
Mhehe	2.3
Mpogoro	4.5
Mgogo	2.3
Total	100.0

Source: Survey data (2000)

4.1.5 Social organisation

The basic unit of organisation is the household. The household has a head normally a man even if he has more than one wife (exception is few female headed households). Labour division, decision-making and other organisations are part of the household responsibilities.

Another level of organisation is that found at groups and village level. These are presented under coherence of the community and under the title ‘capacity’.

4.1.6 Wealth and poverty

There were no signs of excessive wealth or poverty. Normally people with businesses are considered as wealthier. However, the quantities of durable assets can be regarded as a sign of wealth. The mean calculated assets index is 2563.7 compared to the survey area average of 3330.38 indicating that the average wealth of Muyuyu Njia Nne is more than 70% of the average wealth in the survey area of Rufiji flood plain and Delta.

4.1.7 Service delivery

There is one primary school in the village. The school was located in the flood plain, but in 1968 it was moved to uplands due to floods. It currently has 160 pupils (66 male and 94 females) with seven teachers. The number of positions for pupils in the school is adequate for enrolling all children in the village of school going age.

The village has a dispensary, which is accessible to all people. The dispensary is constrained by inadequate staff.

The village depends on shallow wells as the main source of water. This is easily contaminated during use and during flooding.

4.2 Coherence of village community

4.2.1 Barriers to internal communication

The communication within the village is fairly easy. An earth road cuts across the village from Ikwiriri to Mtunda. The river is not a barrier to communication as people travel across the river using canoes. People can also travel to the Delta using canoes (closely following the tides)

4.2.2 Evidence of trust in leadership

Village leaders are among the trusted leaders in the village. Requests for meetings are made through the village leaders and many people attend such meetings. The village chairman is Mr. Hamisi Amiri Mtimbwa and the Village Executive Officer is Ms Hadija Mwipi. We also had a very good member of the local government (*Diwani*) Mr Musa Abadala Mlawa, he commands respect in the village and we enjoyed his company.

There are various organised groups in the village including political parties. People mentioned the following groups in order of priority Women group, CUF (Civic United Front), CCM (Chama Cha Mapinduzi), and madrasa/Islamic groups. In addition, there are theater arts groups in the village.

There are specific days of the week set aside for community development work. The village government has 24 members of which eight are women. Discussion with the villagers showed that women are free to participate in any of the leadership positions, only that they do not stand for the highest posts. Based on the composition of the village government members, women are represented in the village government. Female attendance in village meetings is low, 25% of all the participants.

Regarding migratory habits the villagers indicated that many farmers migrate to the farms during the cropping season. The infrastructure in the village made us believe that the migration pattern is temporary.

In addition to seasonal migration to farms, villagers also migrate to Ikwiriri and Ruaruke to seek for employment (especially young people).

There seems to be no conflict in the village. There is evidence of villagers working together on various tasks ranging from agricultural work to community related work. The latter is stimulated when there is external assistance in works such as road construction.

4.2.3 Signs of enthusiasm and initiatives

In the village government, environmental issues are dealt within the community development committee, giving an indication of environmental protection measures in the village. Tree planting around the village shows peoples' concern in the environment. However, no tree nurseries were noted in the village during the field visit. The villagers' assessment about the state of the environment show that the environment now is generally bad, (22.7% ranking it as very bad and 43% ranking it as bad). Only about 34% of the respondents showed that the state of the environment is good and fair (Table 2). This assessment shows that there is need to consider environmental intervention measures.

There have been changes in the environment, for many reasons in this village. Among them, expansion of agriculture has contributed to tree cutting. Tree harvesting for house construction, timber and canoe building is common. During the socio-economic survey, the villagers indicated that it is not easier to get natural resources now as compared to the past (95.5% of the respondents, Table 3). This confirms the destruction of the environment as time passes. This was taken as a general expression on the concern of the environment.

Initiatives for development were observed on an individual basis through various non-farm economic activities that were going on. There are also various production and entertainment groups. Generally, the respondents indicated the need for improved crop prices like cashewnuts and fish marketing. This may be achieved through group/cooperative formation.

Attitudes to outsiders and the government are generally good. The group of researchers was well received during the visits to the village. The research team enjoyed a good lunch prepared by the village. The acceptance of SIDO project shows an indication that outside projects which fully involve the local people can easily be accepted.

4.2.4 Accessibility

The village is easily accessible by road almost throughout the year. Travelling within the village involves mostly the use of bicycles and canoes when river crossing is necessary. The villagers complained about the availability of the within-village transport.

4.2.5 Capacity

There is a strong village government, which commands respect from the residents. No obvious mismanagement was observed in the village.

There is no major development project in the village, which draws people away from their daily routines. The only external project was the SIDO project in the village. This however, did not draw people away from their daily activities. The SIDO project was supported by DANIDA. The project was involved in making hoes, buckets, pans and other metal works. However, the project was closed in 1998 and is not very active today. The SIDO building has now been converted to offices. Beside this there are signs of accepting new development projects, which are geared towards the improvement of their production.

4.2.6 Biodiversity

As already mentioned, the village encompasses several habitats such as forests, lakes, seasonally flooding river and wildlife with which people are interacting. These necessitate interventions related to wise and optimal interaction between people and their surrounding environment to enhance biodiversity already existing.

5 Mfisini Village

This village is located in Delta North. It is in the north eastern part of Rufiji district. About two hours boat ride from Nyamisati. The village consists of a delta island, with several sub-villages.

In the western part, the village borders Kikale. The Indian Ocean is in the northeastern part of the village, River Bumba borders the village to the south towards Twasalie village. In the Eastern part we also have the Indian Ocean bordering the village. This village was chosen as a representative of the Rufiji Delta North.

5.1 Representation of the village in Delta North

5.1.1 Ecology

The main ecological characteristics, which are similar to other villages in the Rufiji Delta, include proximity to Rufiji River and delta, surrounded by forests mainly mangrove forests, and in higher grounds they are characterised by various settlements.

Unfortunately the team was unable to get the exact figure of the size of the village. The boundaries are known but the village has not yet been mapped. The village has 5 sub-villages namely Mfisini, Mchinga, Salale, Saninga and Simbaulanga.

Total population of the village according to the 1988 census is 1486 people. The villagers estimate that the population has increased about two times now. However, there were no official records regarding the population.

5.1.2 Natural resource use

The main natural resources available in the village are

The Deltas/rivers/channels: These are mainly used for fishing, provision of flood plains for agriculture, water for wild life and navigation/transport. For navigation the villagers are knowledgeable about the tides.

Agricultural Land: This is mainly where farms are located and they benefit from the floods of Rufiji River in both bringing the alluvial soils and diluting the salinity of the ocean water in the Deltas.

Forests: Mangrove forests rich in various species of Mangrove surround the village. Important species include Mkandaa (*Ceriops tagal*), Mkoko (*Rhizophora mucronata*), Mkomafi (*Xylocarpus granatum*), michu, Msikundazi, mpira, mtowo and nchati. (To mention only a few) There are varieties of animal species and birds, which were unfortunately not classified in this survey. The main uses of forest are for building poles and firewood (also salt making). Along the channels packs of poles are seen which we were told are exported to Zanzibar.

5.1.3 Economic activities

The main economic activities in order of priority are agriculture, fishing, forest products, petty business, and salt making.

Agriculture is mainly undertaken at the flood plain along the delta area near the Rufiji River and sometimes outside the flood as rainfed agriculture. The Rufiji Delta agriculture can be divided into two. The first one is the outer Delta characterised by shortage of land, sandy soils and high salinity due to tidal water. The flood of Rufiji River, if favourable brings a lot of fresh water which lowers the salinity, and creating conditions favourable for rice production. This makes the agriculture to be flood dependent. During low floods the water becomes more saline and hence lowers the crop output. The second one is the higher ground, on some Delta islands, where rain-fed rice and other crops like coconut are grown.

The main crops include rice, maize, cassava, coconuts, pumpkins and fruit trees. The main constraint to agriculture is crop losses due to wild animals, such as wild pigs, monkeys, baboons, and hippopotamus.

Fishing is mainly done in the main channels and sometimes the Indian Ocean. Men, women and children do it. Fish species available include *Kamba, mbarata, sanje, kolekole, Chewa Kungu, Mwanje, Kambamwani, musuli, ngatumbo, pandu, taa, kinengwe, pongwe, kumbasu, nzia, ngogo, kambale, ngege, potwe, kaa and mboke*. (just to mention a few). The main constraint in fishing is lack of improved fishing gear (including nets and vessels). Prawn fishing is a very common practice in this village.

Mangrove forests provide a number of benefits to the villagers including building poles. The poles are most often cut for export purposes. The selling price in Zanzibar by the time of the survey was between 9,000 to 12,000 per 'korija' (20 poles). The costs involved are licence fee, village levies, transport and handling at the final destination.

Petty businesses including shops and restaurants are also common in the village.

Mat and pot making are normally the job of women mainly for domestic use and a few for sale.

5.1.4 Ethnic mixes versus uniformity.

Table 7 shows the distribution of respondents by tribe in Mfisini village. The majority of the population are Wanyagatwa (68.8%) followed by 'Wandengereko' (31.2%). According to the sample survey, the ethnic group is dominated by 'Wanyagatwa'.

Table 7: Tribes of respondents in Mfisini

Percent of respondents(n=44)	
Wanyagatwa	68.8
Wandengereko	31.2
Total	100.0

Source: Survey data (2000)

5.1.5 Social organisation

The basic unit of organisation is the household. The household has a head normally a man even if he has more than one wife (exception is few female headed households). Labour division, decision-making and other organisations are part of the household responsibilities.

Another level of organisation is that found at groups and village level. These are presented under coherence of the community and under the title 'capacity'.

5.1.6 Wealth and poverty

The mean calculated assets index was used to assess wealth/poverty. The index is 1335.9 compared to the survey area average of 3330.38 indicating that the average wealth of Mfisini is about 40% of the average wealth in the survey area of Rufiji flood plain and Delta. This indicates a lower wealth as compared to the other survey villages chosen.

5.1.7 Service delivery

There is one primary school in the village with only 2 teachers during the time of field visit. It is currently having about 200 pupils with an average of 20% absenteeism. The number of positions for pupils in the school is adequate for enrolling all children in the village of school going age. The school was built in 1975 since then the parents are demoralised by the low number of teachers allocated to the school. The head teacher argue that this is mainly due to problems of transport which requires the use of boats/canoes, which many people are not acquainted to.

The village has a dispensary, which is accessible by all the people. The dispensary is constrained by inadequate staff. The main problem is lack of latrines. This is because of the nature of the soils (Sandy) which fails to support latrines. One needs concrete or metal drums, which are expensive to many of the villagers. The main health problems are filariasis, malaria, and diarrhea.

The village depends on shallow wells as the main source of water. This is easily contaminated during use and during rainfall periods. This is exacerbated by lack of latrines.

5.2 Coherence of village community

5.2.1 Barriers to internal communication

The communication within the village depends on canoes in most cases. Walking is also important when the islands are not separated by water. Communication within the village is therefore not easy. Communication with other villages also depends on water transport (canoes, motorized boats etc.). Earth roads are available in the mainland at Kikale and Nyamisati. Generally transport on canoes is not only dangerous but also slow.

5.2.2 Evidence of trust in leadership

There seem to be trust in village leadership as requests for meetings are made through the village leaders and many people tend to turn up in such meetings. The village chairman is Mr. Hamadi Mahmudu Kokoro and the village executive officer is Abdsalam Suleiman Milocho.

There are various organised groups in the village including political parties. People mentioned the following groups in order of priority, CUF (Civic United Front), CCM (Chama Cha Mapinduzi), and madrasa/Islamic groups.

The village government has 21 members of which 4 are women members. Discussion with the villagers shows that women are free to participate in any of the leadership positions, only that they do not stand for the highest posts. There was evidence that women do not speak freely in meetings organized by the village government and estimates puts women attendance in meetings at only 15% of all the participants. Women are normally not allowed to be in public places. When we were invited for lunch we were not able to see the women who prepared the food. This may be related to some customs and norms of the village.

Regarding migratory habits the villagers pointed out that many farmers migrate to the farms during the cropping season. However, the planting of permanent crops in the flood plains makes some of the farmers to stay in their field permanently. The villagers did not want to link this with poor school attendance. They claim that children live permanently in the village and not in the farms. This necessitate the family to have two houses, which need to split the food items into two, let alone the people who are going to live with the children. This made us to believe that, there is a linkage between the migratory habits and school attendance. The head teacher of the primary school acknowledged the low attendance of children to school because of migration of the families, sickness, little number of teachers and child labour.

There seem to be no conflict in the village. There is evidence of villagers working together on various tasks ranging from agricultural work to community related work. The later is stimulated when there is external assistance.

5.2.3 Signs of enthusiasm and initiatives

In the village government, environmental issues are dealt with in the community development committee, giving an indication of environmental protection measures in the village. Tree planting (especially fruit trees) around the village shows peoples' concern in the environment. However no tree nurseries were noted in the village during the field visit. The villagers' assessment about the state of the environment show that the environment now is generally bad, (37.5% ranking it as very bad and

37.5% ranking it as bad). Only about 18.8% of the respondents showed that the state of the environment is good and fair (Table 1.2). This assessment shows that there is serious need to consider about the state of the environment

There have been changes in the environment, through many ways. Among them, expansion of agriculture and fish smoking has contributed to tree cutting. Soils in the farming areas are normally saline due to tidal movement of seawater. Lack of flooding of the Rufiji River may lower crop yields. During the socio-economic survey, the villagers indicated that it is not easier to get natural resources now as compared to the past (93.8% of the respondents, Table 1.3). This confirms the destruction of the environment as time goes on. This was taken as a general expression on the concern of the environment

Initiatives for development were shown on individual basis through various non-farm economic activities that were going on. There are also various production and entertainment groups. Generally the respondents indicated the need for improved crop prices like cashewnuts and fish marketing. This may be achieved through group/cooperative formation.

Attitudes to outsiders and the government are generally positive. The group of researchers was well received during the first and the second visits in the village. The research team enjoyed a good lunch prepared by the village. The acceptance of our meeting show an indication that outside projects which fully involve the local people can easily be accepted.

5.2.4 Accessibility

The village is only accessed using waterways no direct road link to the village. On the mainland, the road is accessible almost throughout the year especially the Ruaruke - Kibiti road. Travelling within the village involves the use of canoes and sometimes on foot.

5.2.5 Capacity

We would say that there is a strong village government, which commands respect from the residents. No obvious mismanagement was observed in the village.

There is no major development project in the village, which draws people away from their daily routines. However, there are signs of accepting new development projects, which are geared towards the improvement of their production environment and market development of their products.

5.2.6 Biodiversity

As already mentioned, the village encompasses several niches such as mangrove forests, lakes, water channels/Delta, seasonally flooding river, wildlife etc. in which people are interacting with. These necessitate interventions related to wise and optimal interaction between people and their surrounding environment to enhance biodiversity already existing.

Threats to biodiversity were noted mainly on mangrove species. Respondents mentioned such threats as

Expansion of agricultural lands as population increases,

Harvesting of poles and other products, especially when markets are improved and

The presence of a parasitic plant (*nganjila*) which retard growth of the trees and even killing the trees.

When asked about the proposed prawn farming in the area, the villagers acknowledged it but were not in a position to give more information arguing that this is a court case and may lead to biased judgment if discussed in official reports.

6 Appendix 1: Criteria for Selection of the Pilot Villages

Representative of each of the following four ecological zones (see The Project Planning Matrix Pg. 25)

The Northern delta with adjacent highlands and lower floodplain.

The Southern delta with adjacent highlands and lower floodplain

The Middle floodplain.

The Western floodplain

Representatives of its zone

Ecologically, Size (area, population),

Natural resource use,

Economic activities,

Ethnic mix versus uniformity.

Socially (family/household and social organisation characteristics),

Wealth/Poverty.

Service delivery, etc??

Coherence of village community

Physical closeness/barriers to physical internal communication

Evidence of trust in leadership, e.g. collective tasks, community development project, mass participation in decisions & actions, democracy?

Uniformity of ethnicity

Uniformity of religion

Women's freedom, participation and confidence.

Organisations for various purposes. Which purposes/What is important to them at present?

Migratory/transhumance habits

Conflicts

Solidarity

Signs of enthusiasm and initiative from the communities, including the women

Environment management measures on any level (the household, ten-cell, sub-village, village).

Expression of environmental worries among priority needs, and/or by means of complaints to authorities.

Level of implementation of laws/bye-laws in relation to the environment.

Cases, fines, licence-giving in relation to land use, water use, timber, charcoaling

Initiatives for other types of development e.g. self-help projects independently of donors or govt.

Attitudes to outsiders and government e.g. dependent, independent, welcoming unquestioningly, fatalistic, threatened, suspicious, tired???

Presence of NGOs for community development

Accessibility, both in physical and psychological terms

Physical accessibility in wet, dry season, tides, by what transport means (walking, bicycle, 4wd, boat)

Time involved in getting there

Psychological accessibility; Attitudes (as in D above plus acceptance/resistance new ideas, too concerned with other matters, too poor & struggling or too busy making money, migratory and difficult to meet).

Capacity

Standard of village management

Number and demands of other development projects

Biodiversity

"hotspots"/Ecotones, areas on the margins between ecological zones e.g. floodplain grassland to forest.

H.

Other criteria