Assigned by Ministry of Agriculture, Forestry and Fisheries

Base Study on the Impact of the Population on Agriculture and Rural Environment

—REPUBLIC OF UGANDA—

Focus on
Mabira Forest Reserve and its Vicinity in Mukono District

March 2008

The Asian Population and Development Association
(APDA)

Uganda map

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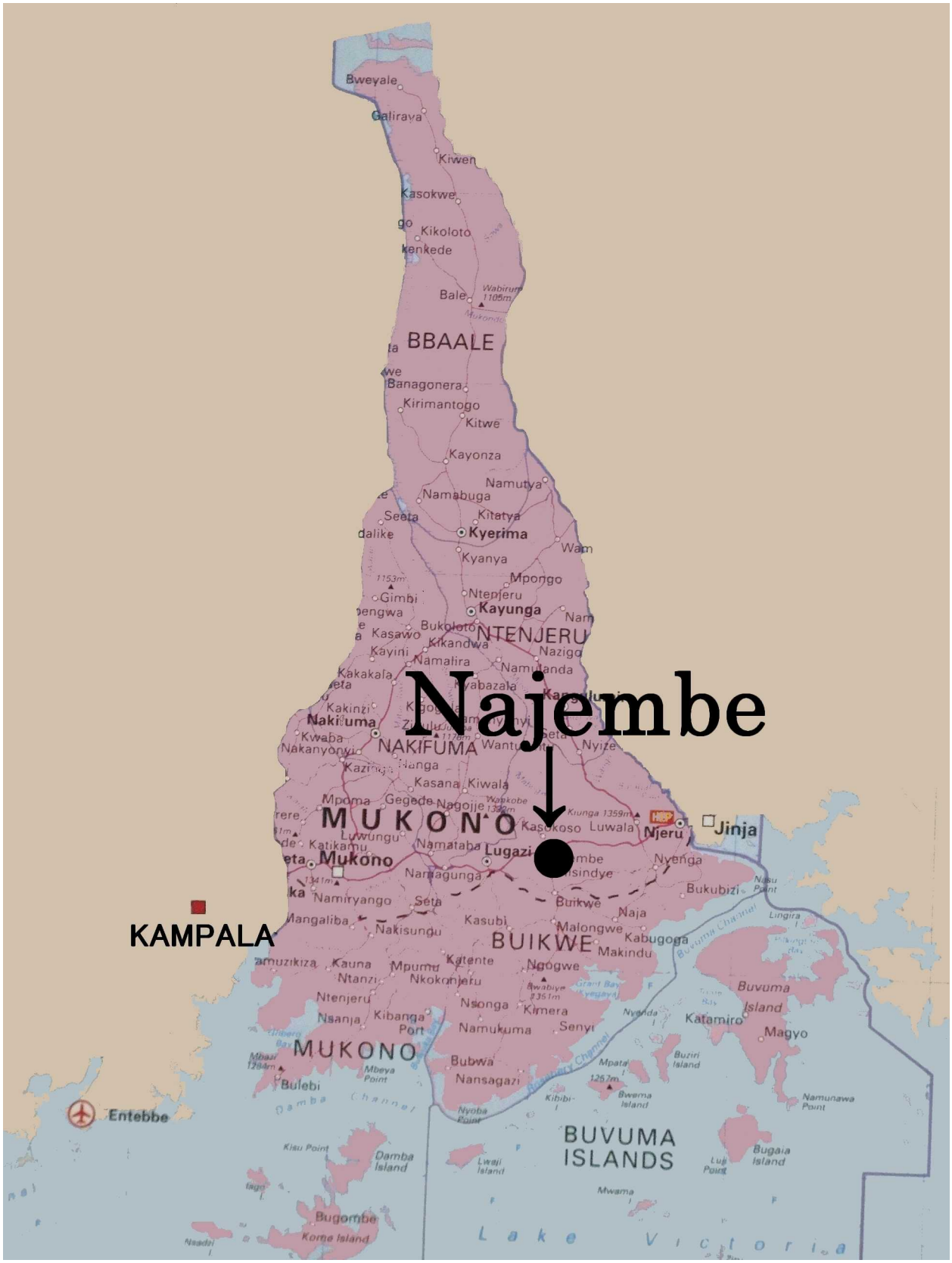
Cartographic Section

Survey area map



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Hearing Survey to a Village(LCI)
Councilor at Target village

Hearing Survey at the Village

Roadside Store of Fuelwood near Target Villages

Foreword

This report is a compilation of the results of a survey conducted in the Republic of Uganda (hereinafter "Uganda") by the Asian Population and Development Association (hereinafter "APDA") under commission of the Ministry of Agriculture, Forestry and Fisheries for FY2007 entitled "Base Study on the Impact of the Population Problem on Agriculture and the Rural Environment." Research and coordination was carried out mainly by the Survey Review Committee which was set up in APDA (led by Dr. Yonosuke Hara, Professor of National Graduate Institute for Policy Studies).

The reduction of poverty and securing of environmental sustainability are pressing challenges of the Millennium Development Goals that require support from the international community and are positioned as priority issues in Japan's ODA Outline.

The economic climate of African countries remains in a difficult condition due to droughts, food crises and political instabilities that have been afflicting the continent since the independence of many countries in the 1960s. At the same time, the rapid population increase that these countries are experiencing is placing a large burden on their national economies that are primarily founded on agriculture.

This project was implemented with the goal of collecting a broad range of information about the population problem in developing countries through analyzing the correlation between population issues and problems in agriculture and rural areas to understand the issues in an effort to determine the policy of future agriculture, forestry and fisheries cooperation projects in addition to offering a concrete proposal.

In conducting the survey, local guidance and cooperation was offered by Dr. Chris Baryomunsi, the Chairperson of Uganda Parliamentarians Forum on Food Security, Population and Development, Ugandan parliamentarian members of this forum and Mr. Kotoha Itakura, Third Secretary of Japanese Embassy in Uganda. A great deal of consideration and cooperation was also offered by the parliamentarian forum staff member, Mr. Wamala Buyungo Musa.

In Japan, guidance on the content of the survey and assistance in initiating the research were offered by the International Cooperation Division, International Affairs Department, Minister's Secretariat of the Ministry of Agriculture, Forestry and Fisheries, for which we hereby express our deep gratitude.

It is our hope that this report will contribute to the promotion of agricultural and rural development programs in Uganda and effective assistance for such programs by the Japanese Government.

This report has been prepared under the responsibility of APDA and does not reflect any opinion or policy of the Ministry of Agriculture, Forestry and Fisheries nor the Japanese Government.

Ms. Kayoko Shimizu,
Vice Chairperson,
The Asian Population and Development Association (APDA)

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Background and Challenges of the Survey

Introduction

The Japanese Government stated in the ODA Charter which was revised in August 2003 that it "plays an active role in issues of global scale such as environment, infectious diseases, population and food." Emphasis is thus placed on comprehensive issues such as environment, population, food security, agriculture, and rural areas which are closely connected with these issues.

Under these circumstances, we focused on the population problem as one of the factors that affects agriculture and rural environment and conducted the survey project with the aim of studying and analyzing the correlation between population growth and environmental deterioration in rural areas such as desertification, identifying the present condition of environmental problems that are occurring in agriculture and rural areas amidst ongoing population growth and their solutions, and contributing to effective and efficient cooperation in agriculture, forestry and fisheries in the future.

1. Background of Uganda Survey

The theme selected for this survey was environmental problems occurring in agriculture and rural areas as a result of rapid population increase caused mainly by natural increases. The designated area of the survey was Sub-Sahara Africa (excluding Sudan) and we were to select a developing country where rapid population increase caused mainly by natural increase was observed and environmental degradation in agriculture and rural areas was taking place.

The Republic of Uganda (hereinafter "Uganda") was selected as the country to conduct our survey for the following reasons.

African countries are in a difficult economic condition owing to frequent droughts, food crises, two oil shocks, rise of trade protectionism among developed countries, sluggish exports and political instability since the 1960s when many of the countries achieved independence. In particular, acceptance of the structural adjustment policy under financial assistance from the World Bank and IMF from late 1970s to 1980s triggered not only the deterioration of the economy resulting from fiscal austerity, shrinking of the public sector and stagnant employment in the private sector but also led to a cutback in social service sector spending for education and health services, thereby lowering the standard of living for people and making life difficult particularly for the poor, women and children.

Uganda achieved independence in 1962 but remained in a socio-economically unstable condition for a long time thereafter. The country has a rapid annual population growth of 3.2% (1991-2002) and a high total fertility rate (TFR) of 6.7. For this reason, the present population estimated at a little less than 28 million as of 2007 is predicted to more than triple to 93 million by 2050. At the backdrop of such population growth exists a situation in which the population continues to grow unchecked amidst lack of government support for family planning and indifference of couples towards birth control, in addition to the high value African society places on large families, the

importance of children as a labour force, high infant mortality and low status of women. Despite being rich in natural resources among East African countries, Uganda is predicted to enter into a difficult phase in the future as a result of having to support an increasing population.

While the creation of employment in urban areas is needed to accommodate the population migrating from rural areas, the country's current industrial structure does not have the absorption capacity of such a large workforce. Infrastructure building has not advanced fully despite active acceptance of private investment from overseas in an effort to foster industries. In addition, capital formation has not reached the level of being able to absorb the rapidly increasing population. Furthermore, higher education opportunities remain insufficient even though many higher education facilities are being built through the implementation of education reform.

Under these circumstances, rapid population growth is increasing the demand for essential commodities including food, firewood and charcoal, and deterioration of the natural environment is being exploited to meet this growing demand. Active acceptance of foreign investment has also caused an expansion of plantations for raw material supply and is escalating the destruction of forests as forest resources that have supported biodiversity are transformed into farmland for growing theses monocrops. It is predicted that future population growth will further deteriorate the natural resources including forest resources through not only its direct effect of increased demand for essential commodities but also its indirect effect of deterioration of natural resources caused by capital formation (investment) that aims to expand employment.

In the present day Uganda where nearly 70% of the workforce is engaged in agriculture, it is necessary to create an environment in rural areas that increases agricultural productivity, meets increasing demand for farm products and at the same time does not cause deterioration of natural resources. Exploring the possibilities of rural development from the viewpoint of population and the rural environment is therefore essential for the sustainable development of Uganda. Moreover, the insight obtained from studying the correlation between rapid population growth and environmental degradation in agriculture and rural areas that are taking place in Uganda will effectively contribute to Japan's development cooperation projects not only for Uganda but also for other Sub-Saharan countries of Africa. The decision to conduct the study in Uganda was made in view of these points.

2. The Research Subject

As mentioned previously, the population of Uganda is predicted to increase for the next several decades. Although a decline in total fertility rate (TFR) has been observed in a recent survey, population growth rate remains on the 3% mark. Considering the fact that a woman gives birth to an average of 6.7 children, a rapid decline in population growth is unlikely.

For this reason, supply of food for supporting the rapidly increasing population of the future is a pressing issue. However, the Government of Uganda has limited awareness about increasing food production with not enough discussion taking place on this subject. Rather, the Government of Uganda appears to be bringing in foreign capital and advancing capital formation in order to build the foundation for sustaining stable economic growth by carrying out policies for industrial development that would

support rapid population growth and by fostering export industries along with the expanding domestic market.

In reality, however, cases in which investment is depleting and destroying forest resources are evident even though policies for attracting investment for economic foundation-building to support an increasing population are promoted. In particular, assignment of national forest reserves to foreign capital for factory construction has become the target of criticisms from students and NGOs in the process of fostering the manufacturing industry through an influx of foreign capital.

However, the situation could worsen further unless some measures are taken against the advancement of deterioration of forest resources. For this reason, the essential challenge for Uganda lies in harmonizing its growing population with the natural environment so that the two can coexist, in particular, how to address the environmental deterioration of agriculture and rural areas that results from rapid population growth. How to embark on practical policies with considerations for the "conservation of the natural environment" and "promotion of economic growth" is the essential challenge Uganda is facing today.

On the other hand, the burden on the forest environment brought about by such changes is also identified as a challenge at the grass-roots level. In this sense, deterioration of forest resources is taking place on two levels. The first aspect is the fact that forest resources are being depleted and forest area is diminishing as a result of growing demand for lumber, charcoal and firewood that accompanies population increase and has already become a social issue in some areas. The second aspect involves dwindling forest resources following the increased need for construction materials in the cities. Forest resources are being cut down for the convenience of transportation and resources in forests adjacent to major roads are rapidly declining owing to these two aspects.

It goes without saying that attempts to protect forest resources are facing difficulties under the present circumstances in which people use firewood and charcoal to cook on a daily basis and construction is booming with economic growth. The issue therefore lies not in the prohibition of forest resource use but in the design of a framework for efficient utilization of forest resources and an integrated effective system to provide knowledge on this and the development of human resources for that purpose.

As one of the means to this end, community-based natural resource management, which has been the principle of resource management in recent years, is attracting attention and has been introduced into Uganda's environmental administration. "Village level rulemaking concerning collection of firewood and lumber" is gradually permeating into rural areas as a result of policymaking and recommendations that were implemented along these lines. In some regions, the rules for firewood and lumber collection had actually been drawn up by the community organization that was formed for community-based forest management (CBFM) and are being observed by the same group. However, the function resource management organizations are playing, the effect they are having on the conservation of natural resources, the institutional mechanism for backing them up and whether they are appropriate for the predicted population increase are not necessarily clear.

For this reason, the first task of this survey was to grasp the realities of community-based forest resource management and the institutional mechanism for

supporting them and identify the entities and their roles within such a framework. Meanwhile, our second task was to understand the realities of agricultural and rural environmental degradation resulting from natural population increase by studying the realities and background of household livelihoods and population increase in rural areas and make an attempt to identify the mechanism of further population increase and environmental degradation which is feared to occur in the future so that we can offer a countermeasure to combat such a situation.

3. Field Survey

Understanding the entire structure including government measures, placement of relevant organizations and their functions and roles, is important in addition to grasping the realities of rural life when analyzing the mechanism of environmental deterioration in agriculture and rural areas. For this reason, information was collected on the realities of diminishing forest resources from the maximum number of relevant agencies possible in addition to conducting a hearing survey of the people that actually live adjacent to forests in order to conduct the survey from a broad perspective.

In the first half of our survey, interviews were conducted at relevant ministries, agencies and international organizations mainly in the capital city of Kampala on subjects such as the realities of the population structure in Uganda as well as management systems and administrative policies concerning forest resources. Our goal was to understand the organizational structure, roles and functions of agencies in charge and ascertain how government agencies were grasping the realities of agricultural and rural environmental degradation caused by naturally increasing population and how they are addressing the situation.

In the latter half of our survey, we conducted a hearing survey in the rural regions adjacent to Mabira Forest Reserve in Mukono District where a significant depletion of forest resources was apparent. The hearing survey in rural areas began by interviewing local administrative bodies, local council chairpersons and council members. After obtaining overall information about the village, respective households were interviewed. We interviewed the households by utilising research assistants to ask questions from the questionnaire. The household's current living conditions were examined by focusing on the involvement of each household with forest resources. The possibility of providing altered responses to questions was anticipated because of the penalties imposed on exploitation of forest resources and hence the fear of revealing true answers. For this reason, we studied the involvement of each household with forest resources while conducting comprehensive research about their living conditions with the aim of eliminating inaccurate responses as much as possible. In particular, the economic reality of each household and the degree of forest resource use was questioned by asking about the use of firewood and charcoal which constitute the most frequent form of forest resource use and of the degree of understanding of rules concerning forest resource management, and by combining them with questions about farming status and realities of farm management in the rural region of the surveyed area.

As a result of these surveys, we believe that we were able to capture an outline of the institutional framework for resource management, grasp the realities of community-based forest resource management and the institutional framework that supports it, and identify the entities and their roles while understanding the current

conditions of agricultural and rural environmental degradation brought about by naturally increasing population and identifying the causes of further population increase and environmental deterioration predicted in the future by studying the realities of household livelihoods and their background.

This attempt to grasp the realities of Uganda, a country experiencing rapid population increase, in an effort to compile basic data on the country's forest resource management situation was achieved with the enormous cooperation and support from many collaborators of the survey. It is our wish that this report will offer beneficial information on the future institutional design of forest resource management for the country's parliamentarians, local policymakers and the rural inhabitants living in the surrounding areas of the Mabira Forest Reserve where the survey was conducted, in addition to contributing to development aid for Uganda.

Components of This Report

This report is composed as follows with focus on the field survey results.

Chapter 1 Outline of Agriculture in Uganda and System for Forest Resource Management

An overview of the characteristics of agriculture in Uganda. Results of field survey concerning nationwide agricultural support system. Trends and history of forest management policies concerning utilization and management of forest resources. The roles of various forest management agencies and their characteristics.

Chapter 2 Results of Field Survey

Survey results based on the questionnaire survey conducted in the rural areas adjacent to the Mabira Forest Reserve in Mukono District which was selected for the case study. In particular, the analysis of the economic structure of rural areas related to forest resources including present conditions of agriculture in the surveyed region, farm economy and current living conditions of each household in connection with forest resources.

Chapter 3 Challenges of International Cooperation

Summary of the challenges related to international cooperation and recommendations based on survey results.

Chapter 1 Outline of Agriculture in Uganda and System for Forest Resource Management

1-1. Overview of Agriculture

1-1-1. Agriculture of Respective Regions

Uganda is an agrarian country blessed with favourable climate. Large ethnic groups living in the Victoria Lakeshore region in South-Central Uganda—which includes the area where this survey was conducted, and where the Baganda and the Basoga live—have traditionally cultivated a kind of banana called "*matooke*" as their staple.[1] Other regions such as the Northern region and Eastern region are inhabited by ethnic groups living on staple foods other than bananas such as finger millet, sorghum and maize. On the other hand, herders living in dry areas mainly rely on livestock products, namely milk. Characteristics of agricultural systems in each region with references to precipitation and crops that are grown, are as follows : (Table 1-1)[2]

Table 1－1 Precipitation by Type of Agriculture

(a) unimodal rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
precipitation	15	35	83	153	173	125	147	194	164	152	103	37
evaporation	215	229	220	141	115	102	90	96	114	140	153	198

(b) bimodal rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
precipitation	21	45	83	184	185	112	119	171	125	122	84	45
evaporation	189	190	229	168	158	114	136	158	173	159	180	186

(c) banana and coffee

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
precipitation	56	65	121	188	176	49	38	54	86	103	100	92
evaporation	121	109	124	115	121	118	118	126	126	121	111	118

(d) montane/moutainous

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
precipitation	46	67	126	200	209	99	92	121	130	155	148	63
evaporation	149	149	146	114	114	117	112	115	129	121	108	121

(e) pastoral

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
precipitation	15	25	48	85	86	56	102	86	45	47	38	24
evaporation	254	213	213	162	164	153	146	164	192	208	207	220

(mm)

Source: Mukiibi, J. K.(2001) *Agriculture in Uganda Vol.1 General Information*. Fountain Publishers. pp.220-230.

(a) Unimodal rainfall farming in the North-western region.

A plains region with an extended rainy season from April to October (precipitation

[1] A Japanese researcher Yasuaki Sato has empirical works on *matooke* cultivation and its socio-cultural implications on the Ganda, e.g. Sato, Yasuaki, (2004), "Lifeworld interwoven by human and bananas: the cultivation and utilization of bananas in Buganda, Central Uganda" *Biostory* Vol.2, pp.106-121, The Society of Biosophia Studies. (in Japanese); Sato, Yasuaki, (2006), "Ethnological comparison between barkcloth and bananas in Buganda, Central Uganda," *Tropical Ecology Letters*. No.64, August 25. The Japan Society of Tropical Ecology (in Japanese).

[2] See the following for characteristics of agriculture by region: Musiitwa & Komutunga (2001) "Agricultural Systems", in Mukiibi, J. K. *Agriculture in Uganda Vol.1 General Information*. Fountain Publishers. pp.220-230.

125-195mm). Drought is said to occur once every 30 years. A wide variety of crops including cotton, finger millet, pigeon peas, ground nuts, sorghum, cassava, sunflower, cowpeas and tobacco are cultivated. The crops are grown through mixed cropping and rotation cropping. The cultivated area per capita in this region is 1.9 acres.

(b) Bimodal rainfall farming in the region around 1 to 3 degrees north latitude.

Nearly half of Uganda falls into this area. Precipitation peaks are short-lived and occurs from April to May (180-185mm) and from August to September (135-170mm). Along with agriculture, people in this region mainly make their living by raising livestock. This pattern can be further divided into three subcategories. First, there is the Iteso ethnic group that mainly grows finger millet, cotton, sweet potato, cassava, cowpeas, ground nuts and sesame. Arable land in this region is 2.4 acres per capita and ploughed by cattle. Secondly, there is the Langi, who, unlike the Iteso, do not use cattle for ploughing and perform farm work by collective manual ploughing. Crops cultivated include cassava, maize, finger millet, cowpeas, ground nuts, pigeon peas and sesame. Recently, rice has become an important commercial crop particularly in the wetlands surrounding Lake Kyoga. The third pattern is a combination of banana and other crops found in some parts of Mid-Western and Mid-Eastern regions of the country inhabited by ethnic groups speaking the Bantu language as opposed to the ethnic groups practicing the above two patterns that speak the Nilotic language. Comparing the two, the farmers engaged in agriculture under this category are characterized by their preference for banana cultivation despite its low productivity and their small scale livestock raising. Aside from bananas, they grow finger millet, beans, sorghum, yams, pigeon beans and sesame. In recent years, the importance of maize as a commercial crop has increased to replace cotton, while tobacco is now grown in some regions of the Mid-West.

(c) Banana and coffee agriculture in the South-Central Great Lakes region.

This most fertile region in Uganda, located on the shores of Lake Victoria, is inhabited by Bantu ethnic groups including the Baganda and the Basoga. The original vegetation to the north of the lake where we conducted our survey is humid forest containing the later mentioned Mabira Forest that possesses fertile soil. Precipitation peaks occur from March to May (120-185mm) and from October to December (90-100mm). The rainy season lasts about as long as the dry season. The pattern of precipitation is bimodal, but differs considerably from the aforementioned unimodal rainfall in that it is not necessarily hot and dry during the dry season because of the difference in vegetation. In this region where bananas are used as a shade tree to grow coffee, it is often difficult to grasp the growing area by crop owing to mixed cropping of various plants including maize, beans, ground nuts, sweet potato, cassava, pumpkin and yam (see, for instance, Photo 1-1 from the surveyed village). Sorghum is also grown here, but unlike in other regions where it is a staple, it is used as a material for brewing liquor made from bananas. Cotton growing is declining in both growing area and production levels in this district due to the spread of a pest in recent years and its intrinsic inadaptability to the humid climate.

Apart from above-mentioned major variations of agricultural systems, there are also montane agriculture areas located at altitudes above 3000 metres and pastoral agriculture located in dry areas.

(d) Montane agriculture is found in Mt. Elgon Highland in the east, Kabale-Kisoro Highland in the south-west, and Mt. Ruwenzori Highland in the western part of the country. The land maintains a certain level of fertility because of volcanic soil and has high precipitation. Crops such as maize, banana, coffee, beans, finger millet, yam and sweet potato are grown.

(e) Pastoral agriculture is practiced in dry areas where there are hardly any months that receive precipitation in excess of 100mm and livelihood relies primarily on livestock products (cow milk in particular). It also involves cultivation of maize, sorghum, bulrush millet, finger millet and cassava on very small scale for subsistence.

Photo 1-1 A household farm in Kinoni Village. A mixture of various crops including *matooke*, cassava and coffee are being grown.

1-1-2. Outline of the Agricultural Market

Through the period of colonial rule, the chaos after independence and under the Structural Adjustment Programme (SAP), the history of the infiltration of the cash economy into local communities coincides with shifting forms of agricultural management, from people growing crops for their subsistence, to growing crops for sale outside of their region. As the current realities of farm management at each household are described in the report of survey results in Chapter 2, this chapter will offer a brief history behind the introduction of the cash crop during the British protectorate period and outline the situation from the liberalization of the agricultural industry and onward.

The cash crops that the Britain introduced into Uganda as the suzerain during the protectorate period were cotton and coffee. After obtaining indirect rule over kingdom territory of Buganda through the Buganda Agreement which was signed with the king of the Buganda Kingdom in 1900, Britain started collecting “hut tax” in order to support the finances of the protectorate through the political system of the kingdom which was granted certain political autonomy. Cultivation of cotton that started in 1902 gradually expanded and the people of the kingdom obtained the means of cash

income.[3]

As a result of this Buganda Agreement, Britain partially introduced private land ownership by reforming the existing land system that placed land under the ownership of the King of Buganda called "*Kabaka*". Consent was obtained from the Kingdom of Buganda to place the regions in the kingdom where population was relatively sparse under the jurisdiction of the protectorate government as property of Britain. The remainder, consisting of relatively densely populated regions, were divided into *mailo land* and their ownerships were granted to Buganda Kingdom royals and chiefs ranked under the *Kabaka* (whose number later increased from 1,000 to 4,000).[4] Consequently, land became a disposable asset for the chiefs who became the owners of land and the power of the king was relatively weakened.[5]

Partly due to encouragement from Britain, cotton cultivation in East Africa faced a dramatic development particularly in Uganda. Major factors were the existence of Indian merchants that purchased raw cotton from cotton farmers in addition to the opening of a railroad to the shores of Lake Victoria.[6] Plantations of European settlers took on the role of growing coffee. However, after these plantations were hit hard by the plummeting farm produce prices in the world market in 1921, coffee planting was taken over by small Ugandan farmers in high precipitation regions of South-Central Lakeshore and in the Elgon Mountains practicing montane agriculture, in addition to growing cotton in the plains. Some of the Ganda chiefs owning *mailo land* started to grow cotton and coffee by accepting migrant workers from other parts of the country and neighbouring countries such as Burundi and Rwanda. Cotton and coffee thus became the two major export crops of Uganda. For instance, cotton and coffee accounted for 91% (62% and 29%, respectively) of the country's exports in 1951. A policy of creating a marketing board for each of these important agricultural exports where produce was purchased at fixed prices (lower than world prices) and the surplus was allocated to the marketing boards and development budgets of the protectorate government, was employed.[7]

The agricultural market prior to the liberalization of the agricultural sector under the SAP was mostly formed in this manner. In this system, cash crops sold by farm households were sent to markets outside the region via the marketing board except during the period around 1950 when regulations on private marketing of agricultural products were eased.[8] The marketing board system continued after independence. Figure 1-1 shows this in a flow chart with an emphasis on main cash crops. These marketing boards were abolished with the liberalization policies adopted from the 1980s onward and private brokers became the leaders of agricultural market. Table

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[3] Yoshida, Masao (1978) "*The Modern History of Africa II East Africa*," Yamakawa Shuppansha Ltd. (in Japanese).

[4] See the aforementioned Yoshida, Masao (1978) and West, H. W.(1972) *Land Policy in Buganda*. Cambridge University Press. for the Buganda Agreement and the Mailo Land System.

[5] UK also attempted to sign similar agreements with other traditional kingdoms such as Bunyoro, Ankole and Toro but failed to carry out any land reform (agreement itself faced difficulty with the Kingdom of Bunyoro).

[6] UK and Japan (Nihon Menka, Toyo Menka, Kosho) were also purchasing raw cotton during the protectorate period.

[7] See Yoshida, Masao(1978) cited above.

[8] According to a hearing at Uganda Cooperative Alliances (UCA). Also see 1-2-3.

1-2 shows the production volume of typical crops that were shipped from production centres to the market throughout the country from 1970-2004. Coffee production has remained relatively stable while raw cotton production slumped around the beginning of the 1980s. Aside from traditional cash crops from the protectorate period such as coffee and cotton, cultivation of non-traditional cash crops have been promoted by the government since the 1980s.[9] Such crops include beans, maize, soybeans, sesame and ground nuts, and as shown in Table 1-2, their production started to increase around the mid-1980s.

Let us now turn our attention to non-cash crops that are regarded as main crops and commercial crops. As mentioned earlier, banana production(which is the traditional crop of Bantu-speaking ethnic groups such as Baganda and Basoga in the South-Central Lakeshore Region) as well as finger millet and sorghum (which is the traditional crop in the bimodal rainfall region around 1 to 3 degrees north latitude) has remained stable over the past 30 years compared to the aforementioned non-traditional cash crops.

At present, traditional and non-traditional cash crops pass through several private brokers after they are shipped from the farm to the domestic market and reach wholesalers. Brokers from outside the region come to some villages on trucks to collect the crops. In such cases, farm households carry the crops that are put in bags containing a fixed weight (100 kilograms per bag for shattered/dried maize, for instance) to the village centre where the trucks are parked and sell the crops directly to those brokers.

Those engaged in brokerage often live in the village or its vicinity in many cases. These brokers store the crops that they purchased from the villagers and ship them to the markets in local cities and the capital when opportunity arises by hiring some form of transport (some of them also own a car). In other cases, they ship the crops to brokers from outside the region that come to the village to purchase the crops.

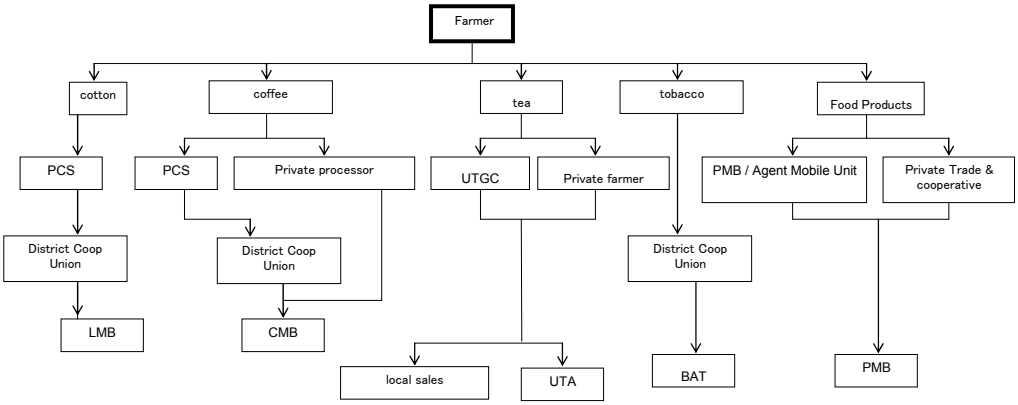
In regions where asphalt-paved arterial roads directly connected to the capital and local cities are accessible (as in the case of the villages included in this survey), local brokers and members of farm households carry the crop on foot or on bicycle to the arterial road to sell them to people driving on the road and to local markets located along the road. Main crops and commercial crops aside from the aforementioned cash crops are also shipped to these local markets.

The channel and format of marketing for cash crops and commercial crops from farms as mentioned above are decided according to the type of crop as well as geographic conditions including distance to the market and road conditions. An example is the shipment of bananas, which is a traditional main crop of the South-Central Lakeshore region that includes the region where this survey was conducted. Characteristics of bananas as a commercial crop include its year-round availability and short shelf life after it is harvested. Bananas are in contrast with beans and maize which are harvested, dried and stored all at once at a certain time of year, packed and shipped in 100 kilogram bags and converted into cash. As households owning banana plantations have bananas that are ripe and ready for harvest at all times, bananas can be consumed and sold anytime. Since there are brokers in the region that go around collecting

[9] Bibagambah, J. R.(1996) *Marketing of Smallholder Crops in Uganda*. Fountain Publishers.

bananas on their bicycles, banana-growing households can sell their crop to local brokers in small portions when they need cash even if they do not have their own means of transport. A broker carrying six to seven bunches of bananas on a bicycle pushes his bicycle to the nearest arterial road (Photo 1-2). This is how local brokers sell their crop to a local market on an arterial road. Otherwise, they wait for customers driving on the arterial road as shown in Photo 1-3.

Figure 1－1 Agricultural Marketing Channels Before 1991 in Uganda



LMB＝Linty Marketing Board、CMB＝Coffee Marketing Board 、UTA＝Uganda Tea Authority、BAT＝British American Tobacco、
PCS＝Primary Cooperative Society、PMB＝Produce Marketing Board、UTGC＝Uganda Tea Growers Cooperation

Table 1－2 Crop Production (1970～2004)

(:1000MT)

year	coffee	cotton	tabacco	beans	maize	soya beans	sesame	ground nuts	banana	casava	rice	finger millet	sorghum	sweet potato	potato
1970	201.5	467.0	3.4	186.0	388.7	n.d.	20.0	244.3	7093.5	n.d.	n.d.	663.0	n.d.	n.d.	n.d.
1971	175.5	412.0	4.4	221.8	421.8	n.d.	30.9	250.0	7734.2	n.d.	n.d.	650.0	n.d.	n.d.	n.d.
1972	183.7	411.0	5.0	236.8	499.9	n.d.	28.8	233.9	9261.9	n.d.	n.d.	593.7	n.d.	n.d.	n.d.
1973	215.7	422.0	3.9	170.4	419.0	n.d.	30.7	212.2	9293.2	n.d.	n.d.	643.3	n.d.	n.d.	n.d.
1974	198.6	270.0	3.2	169.3	429.6	n.d.	30.9	199.7	8880.0	n.d.	15.0	570.6	n.d.	n.d.	n.d.
1975	198.5	170.0	4.0	325.8	570.5	n.d.	39.1	194.4	9107.0	n.d.	16.0	681.5	n.d.	n.d.	n.d.
1976	137.5	134.0	3.7	337.1	673.7	n.d.	33.4	176.9	8138.0	n.d.	29.9	567.1	n.d.	n.d.	n.d.
1977	155.9	75.0	2.5	252.5	566.2	n.d.	38.1	192.6	8531.0	n.d.	21.0	577.7	n.d.	n.d.	n.d.
1978	121.2	110.0	1.4	291.1	594.0	6.0	39.6	187.2	8855.0	n.d.	26.0	561.0	n.d.	n.d.	n.d.
1979	103.1	41.0	0.8	182.0	453.0	3.0	16.0	80.0	6090.0	n.d.	15.0	481.0	n.d.	n.d.	n.d.
1980	135.2	33.0	0.4	133.0	286.0	3.0	20.0	70.0	5699.0	n.d.	17.0	459.0	n.d.	n.d.	n.d.
1981	97.0	22.0	0.1	240.0	342.0	5.0	25.0	80.0	5900.0	n.d.	15.0	480.0	n.d.	n.d.	n.d.
1982	166.6	28.0	0.6	300.0	393.0	6.0	35.0	90.0	6596.0	n.d.	19.0	528.0	n.d.	n.d.	n.d.
1983	97.6	54.0	1.6	314.0	413.0	7.0	42.0	99.0	6647.0	n.d.	22.0	545.0	n.d.	n.d.	n.d.
1984	166.6	66.0	2.0	265.0	281.0	9.0	39.0	118.0	6461.0	n.d.	20.0	223.0	n.d.	n.d.	n.d.
1985	157.4	88.0	1.5	267.0	343.0	8.0	33.0	84.0	6655.0	n.d.	19.0	480.0	n.d.	n.d.	n.d.
1986	138.7	24.0	0.9	267.0	322.0	10.0	35.0	118.0	6565.0	n.d.	21.0	427.0	n.d.	n.d.	n.d.
1987	155.0	16.0	1.3	299.0	357.0	8.0	33.0	122.0	7039.0	n.d.	20.0	518.0	n.d.	n.d.	n.d.
1988	143.0	11.3	2.5	338.0	440.0	14.0	36.0	134.0	7293.0	n.d.	23.0	578.0	n.d.	n.d.	n.d.
1989	133.0	14.0	3.8	389.0	624.0	16.0	45.0	145.0	7469.0	n.d.	45.0	610.0	n.d.	n.d.	n.d.
1990	131.7	23.0	3.3	396.0	602.0	37.0	62.0	158.0	7842.0	n.d.	54.0	560.0	n.d.	n.d.	n.d.
1991	128.7	44.0	5.1	383.0	567.0	59.0	61.0	144.0	8080.0	n.d.	61.0	576.0	n.d.	n.d.	n.d.
1992	147.4	40.0	6.7	402.0	657.0	53.0	72.0	147.0	7806.0	2896.0	68.0	634.0	375.0	1821.8	268.0
1993	110.3	43.0	5.2	428.0	804.0	67.0	75.0	153.0	8222.0	3139.0	74.0	610.0	383.0	1958.0	320.0
1994	144.6	20.8	6.5	378.0	850.0	75.0	70.0	142.0	8500.0	2080.0	77.0	710.1	390.0	2129.0	368.0
1995	198.3	n.d.	6.9	390.0	913.0	79.0	71.0	144.0	9012.0	2224.0	77.0	632.0	399.0	2223.0	402.0
1996	287.9	n.d.	6.3	234.0	759.0	87.0	73.0	125.0	9144.0	2244.9	82.0	440.0	298.0	1541.0	318.0
1997	n.d.	n.d.	n.d.	221.0	739.0	87.0	73.0	134.0	9303.0	1191.0	84.0	502.0	294.0	1894.0	360.0
1998	n.d.	n.d.	n.d.	387.0	924.0	92.0	75.8	140.0	9318.0	3204.0	90.0	642.0	420.1	2176.0	384.0
1999	n.d.	n.d.	n.d.	363.4	956.4	101.0	55.3	110.0	8925.7	4348.0	90.8	524.9	342.2	2123.5	448.8
2000	n.d.	n.d.	n.d.	380.6	995.4	128.0	57.7	111.6	9403.4	4429.1	104.2	462.5	299.1	2163.2	477.8
2001	n.d.	n.d.	n.d.	463.0	1066.3	144.0	60.7	117.2	9706.6	4695.8	108.9	505.8	350.5	2268.8	507.8
2002	n.d.	n.d.	n.d.	484.8	1105.3	166.0	63.0	118.8	9862.2	4791.2	114.7	511.0	353.8	2338.2	545.8
2003	n.d.	n.d.	n.d.	475.7	1180.7	160.0	71.2	120.4	9674.7	4860.8	126.1	554.3	348.8	2354.5	556.8
2004	n.d.	n.d.	n.d.	412.5	9811.5	157.9	74.4	109.9	9665.0	4903.6	115.7	570.9	330.7	2389.8	572.9

Source : Bibamgambah（1996）*Marketing of Smallholder Crops in Uganda* . Fountain Publishers; MPED（1997）Statistical Abstract（1997）;
Mukiibi, J. K（2001）*Agriculture in Uganda Vol.1 General Information* . Fountain Publishers; Ministory of Agriculture (Government of Uganda)[n.d.] . n.d. : no data

Photo 1-2 Shipment of bananas from the village using a bicycle. This is a typical method seen in the South-Central Ugandan banana (*matooke*) growing region. Each bicycle carries six to seven bunches of banana. This photo was taken in Rakai District. (Photo courtesy of Mr. Yasuaki Sato)

Photo 1-3 Bananas are carried on bicycle to the roadside of arterial roads where vendors wait for customers that drive by. Rakai District. (Photo courtesy of Mr. Yasuaki Sato)

1-2. Effort of Country-Wide Agricultural Support Organization and Agricultural Technology Dissemination System

It goes without saying that availability of agricultural technology, market information and farm credit is important for farmers and that their inexistence would lead to a vicious cycle of low productivity and poverty[10]. Efforts made by the central government and farmers toward a framework that supports farming across Uganda will now be introduced.

1-2-1. National Agricultural Advisory Services (NAADS)

The Government of Uganda has been implementing the Poverty Eradication Action Plan (PEAP) since 1997.[11] One of its priority issues is "enhancing the incomes of the poor" and Plan for Modernization of Agriculture (PMA) was implemented as a direct income improvement measure particularly for poor households in rural areas. Among the seven pillars PMA laid down, the National Agricultural Advisory Services (NAADS) is the activity implementation entity responsible for approaching this matter from the aspect of agricultural technology dissemination. (Figure 1-2)

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[10] Reference to difference in access to agricultural technology and information arising from difference in income level and its implications is made in a paper prepared by NAADS staff, H. Bagnall Oakeley et al. (2004), "Mapping and understanding farmers indigenous Agricultural Knowledge and information systems and the implications for contracted research and extension systems", *Uganda Journal of Agricultural Sciences*, Vol.9, pp119-125.

[11] PEAP was formulated as a comprehensive national development program but is currently serving as the Poverty Reduction Strategy Paper (PRSP) as well. See: Ministry of Finance, Planning and Economic Development, "Poverty Eradication Plan (2004/05-2007/08)" for details on PEAP.

NAADS was established by the NAADS Act which was enforced in 2001 and commenced its operation in 2002. It is vested in the Ministry of Agriculture, Animal Industry and Fisheries but is a semi-autonomous body so that it can carry out its operations independently.

The mission of NAADS is to offer an agricultural technology extension service that is more efficient and effective than conventional technology extension services. It seeks to make a departure from subsistence-oriented agriculture to market-oriented agriculture and usher in the improvement of agricultural profitability and improvement of farm income. In concrete terms, it allocates coordinators to each target district and sub-county and provides technology and information with regard to the selection of farm equipment, commercial crops and related projects including livestock raising through farmers' organizations.

Particular emphasis is placed on Enterprise Development and Promotion (EDP) to promote market-oriented agriculture. EDP offers advice on the development of farmer-driven enterprises and selection of strategic crops on a district level in addition to development of district-wide short-term strategic enterprises that combine the two and programs for building partnerships with private enterprises. Examples of successful farmer-driven enterprises cited by NAADS staff in our interview included apiculture, dairy cattle raising, poultry farming and production of upland rice, sweet potato, citrus, mango and sunflower oil.

NAADS is also promoting the formation of farmers' organizations as they have the potential to receive support and services not only from NAADS but also from NGOs. Although the continuity of such organizations is affected to a large degree by the cultural factors of the locality, NAADS is encouraging farmers to sustain their organizations through training and awareness-raising. Having access to extension services offered by NAADS is also serving as an incentive for farmers to maintain their organization.[12]

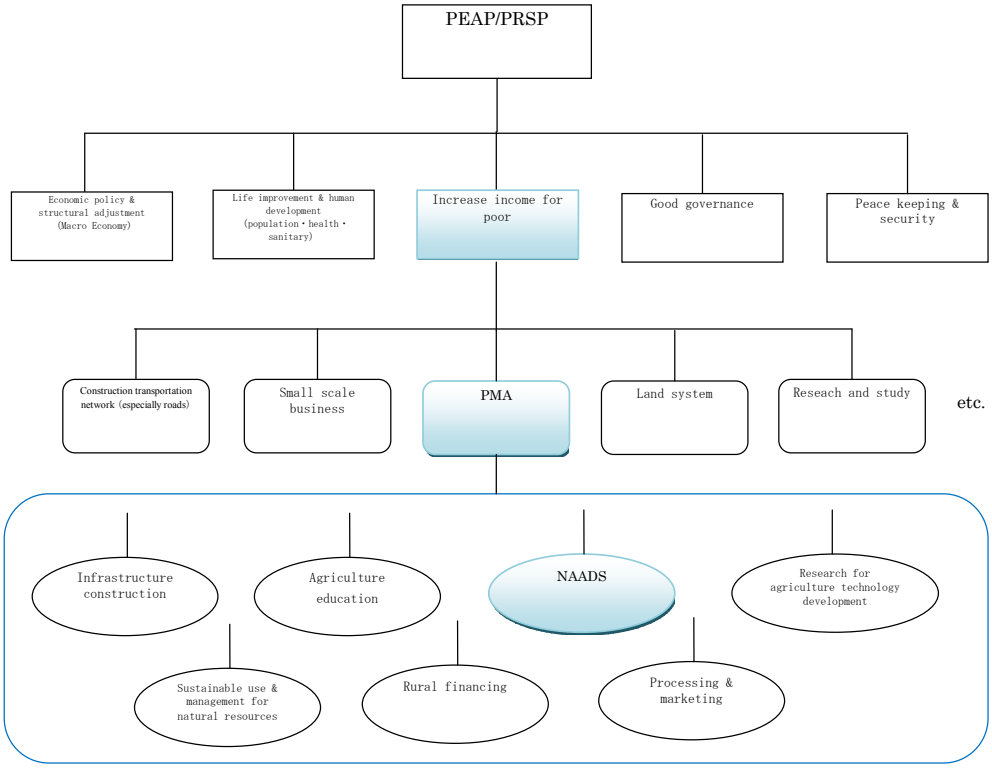
NAADS has been gradually expanding the number of districts for implementing its programs since its launch in 2002, covering 710 sub-counties in 79 districts as of 2007 to realize almost nationwide coverage of Uganda. (Figure 1-3)

Mukono District, where this survey was conducted, is a district where the program had been introduced since the launch of NAADS in 2002. Apiculture and vanilla production are promoted as strategic enterprises in this district. In the field survey, we confirmed that the farmer-driven project for passionfruit is implemented at Buvunya Village. (Photo 1-4)

Incidentally, 80% of NAADS' funds comes from International Development Association (IDA) of the World Bank Group, International Fund for Agricultural Development (IFAD) and other donor countries. The remainder of the contributions came from the Central Government of Uganda (8%), district (5%), sub-county (5%) and farmers themselves (2%). The amount of funds allocated to NAADS is decided by the Ministry of Finance from the budget for the agricultural sector.

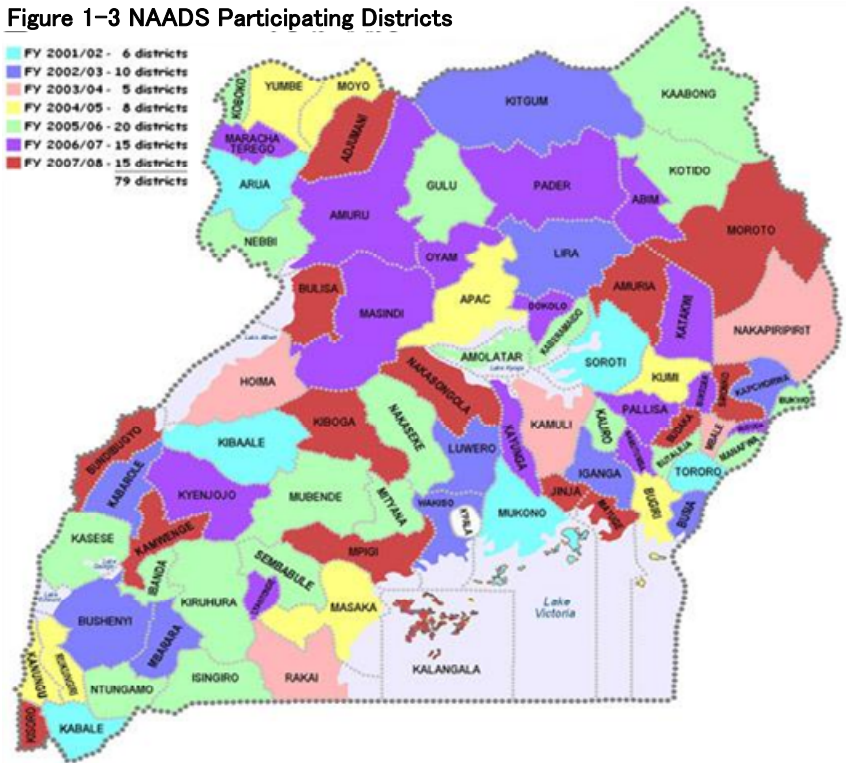
[12] Farmers' organizations that were planned and/or formed sometimes disintegrate because of a misunderstanding that NAADS would be offering grant aid.

Figure 1-2　Relationship Between Agricultural Programmes and NAADS



Source:internal materials and website

Figure 1-3 NAADS Participating Districts



Source: NAADS

Photo 1-4 A sign for the passionfruit production group in Buvunya Village.

1-2-2. Uganda National Farmers Federation (UNFFE)

UNFFE is one of the frameworks for technology dissemination services that farmers organized for themselves.

UNFFE has its origin in the farmers' competition which was held by the Ministry of Agriculture in fiscal 1991/92. The farmers' group that won the competition received not only agricultural inputs but also an opportunity to participate in overseas agricultural training tours abroad including U.S. and Europe. The participants of these training tours are purported to have learned that farmers in these countries are very well organized and aggressively participate in activities. For this reason, they submitted a report to the Ministry of Agriculture expressing their desire to form an organization that connects farmers. As a result, the initial effort for the organization covering the entire country was made as the Ministry of Agriculture invited three model farms from each district and formed the Uganda National Farmers Association (UNFA). Its activities eventually took root and led to the establishment of UNFFE to integrate these associations.

The purpose of UNFFE lies in seeking partnership among members and reflecting their voices in agricultural policies in addition to supporting their farming and livelihoods by offering agricultural technology and information. It has established a cooperative system with relevant government agencies and is realizing lobbying activities by interfacing with the aforementioned NAADS and many other agencies.

In the area of farming and livelihood support, UNFFE trains farm instructors instead of offering direct guidance to its members. A wide variety of instruction courses including farm management economics, agroforestry, agricultural marketing, livestock husbandry, fish farming etc. are offered and instructors receive education according to the level of their skills.

UNFFE currently has its office in 56 districts with each office having jurisdiction over the sub-counties in those districts. On the village level, participation in the instructor training course is appealed through the media.

The membership of UNFFE as of 2007 is said to exceed 200,000 individuals and 70 organizations offering materials and services (including NGOs).[13]

The membership fee when UNFFE was initially established was 1,000 U.Sh. (= 67 yen) per person for individuals and 1,500 U.Sh. (= 100 yen) per family. Today the amount differs depending on the district and can be as high as 3,000 U.Sh. (= 201 yen). Thirty percent of membership income goes to the parish level budget and 70% is appropriated at the district level. Each district also allegedly pays 200,000 U.Sh. (= 134,380 yen) a year to UNFFE headquarters.

Unlike the cooperatives discussed later, UNFFE is a corporate entity and does not have share capital or a dividend system seen in cooperatives. Farmers can freely become a member of either organizations and some have joined both.

1-2-3. Uganda Cooperative Alliances (UCA)

Like UNFFE, UCA is another framework for farmers to create their own independent organization that meets their needs. The history involved in the formation of UCA goes back to the colonial period. According to Executive Director of UCA, the story is as follows.

Regulations on the marketing of cash crops such as coffee and cotton by the colonial government which started with the establishment of the Coffee Marketing Board[14] (predecessor of what is hereinafter referred to as "cooperative") (also see Paragraph 1-1-2) in 1913 allowed for a disproportionate concentration of profit for Indian merchants and increased the dissatisfaction among Ugandan farmers. This dissatisfaction turned into pressure against the colonial government, and free sales and processing of farm products was approved around 1950. In addition, technology extension services became available from the Ministry of Trade and Marketing through cooperatives. However, farmers lost their grip on cooperatives again to the central government when the country won independence as the Republic of Uganda in 1962. The intention of the government at the time was to exercise control over cash crop marketing and enforce political measures by utilizing the cooperative network at the same time. The cooperative had nearly 1,000 staff overall and was making a profit by running hotels and gas stations. Meanwhile, the distrust against the cooperative management grew among farm producers as they amassed personal fortunes without sharing the profit with the farmers. The government decided to withdraw from the cooperative after the introduction of structural adjustment programs in 1987. However, the cooperative was not prepared for independent management as the farmers had become weary of the cooperative. The cooperative practically became dysfunctional and was abolished in 1995. Then a movement to reorganize the cooperative occurred in 2002 and UCA was re-established as a result.

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[13] From UNFFE Official Website.

[14] Districts that were coffee production centres at the time were Bushenyi, Mbarara, Masaka, Mpigi, and Mukono where this survey was conducted.

UCA strived towards sound management of the cooperative. It began by planning for fund procurement and formed Saving and Credit Cooperatives (SACCO) to launch the programs for savings and credit granting for the members. Then it organized a producers' cooperative and a processing/marketing cooperative and is currently seeking promotion of agriculture through coordination among these three sectors. Anyone can freely join or withdraw from the cooperative and naturally join only one of the three sectors. UCA is different from the aforementioned UNFFE in that members are users and at the same time part of the decision making process.

Members contribute 5,300 U.Sh. (=356 yen) per share and pay 10% of profit from sales as commission when crops are distributed. Members can also receive loans from commercial banks on a cooperative basis.

The recent situation of SACCO, which has been the priority of UCA from the outset and serves as an important credit offering institution for farmers, is shown in Tables 1-3 to 1-7. As seen in these tables, increase in all figures including the number of SACCO organizations and their members dramatically demonstrate the acceleration of their programs. In particular, Mukono District where this survey was conducted has recorded an extremely high growth rate in each index. A calculation of the savings-loan ratio to evaluate its function as q rural financial institution gives figures as high as 173.7% and 151.1% for 2006 and 2007, respectively, for SACCO as a whole. Although it is not possible to make a comprehensive judgment due to lack of detailed data on the repayment rate and state of investment, one can see that providing credit to its members has been realized to a significant extent for now. The same figures for Mukono District are 112.4% and 106.1% for respective years. They are lower compared to the overall average but the organization appears to be contributing sufficiently to local agriculture as a rural financing institution.

At present, there is one SACCO and processing/marketing cooperative in every sub-county. As for the production cooperative, each sub-county has 5 to 6 cooperatives on a parish or village level.

In addition, several programs are being implemented through support from the Swedish Cooperative Centre, Canadian Cooperative Association and Norwegian Society for Development.

Table 1-3 Results of SACCO FY2006/07

	2006	2007	Growth rate(%)
Number of SACCO member organization	38	42	10
Membership (person)	24,297	32,099	32
Capital (00mil U.Sh.)	11.41	15.09	40
Savings (00mil U.Sh.)	13.46	23.08	72
Saving accounts	23,198	29,375	27
Balance (00mil U.Sh.)	23.38	34.88	49

Source:Uganda Co-operative Alliance Limited(2006) *Annual Report* .

Table 1-4 Growth Rate for SACCO Membership by Districts

District	No. of SACCO member organizations		Membership		
	2006	2007	2006	2007	Growth rate (%)
Bushenyi	9	10	8,384	11,131	33
Kamuli	8	9	3,515	4,901	39
Mukono	6	8	3,128	4,518	44
Mbale	7	7	2,926	3,785	29
Masaka	8	8	6,344	7,764	22
Total	38	42	24297	32099	32

Source:Uganda Co-operative Alliance Limited (2006) *Annual Report.*

Table 1-5 Growth Rate of Capital of SACCO by District

District	2006	2007	Growth rate(%)
Bushenyi	665	900	33
Kamuli	91	125	37
Mukono	95	147	55
Mbale	72	96	34
Masaka	218	331	51
Total	1,141	1,599	40

(mill U.Sh.)

Soource: Uganda Co-operative Alliance Limited (2006) *Annual Report.*

Table 1-6 Growth Rate of SACCO Savings by District

District	2006	2007	Growth rate(%)
Bushenyi	711	1,044	47
Kamuli	80	133	65
Mukono	210	408	94
Mbale	99	123	25
Masaka	245	600	145
Total	1,346	2,308	72

(mill U.Sh.)

Source: Uganda Co-operative Alliance Limited (2006) *Annual Report.*

Table 1-7 Growth Rate of Balance of SACCO by District

District	2006	2007	Growth rate(%)
Bushenyi	1,313	1,904	45
Kamuli	183	211	16
Mukono	236	433	84
Mbale	174	243	39
Masaka	432	697	61
Total	2,338	3,488	49

(mill U.Sh.)

Source: Uganda Co-operative Alliance Limited (2006) *Annual Report.*

1-3. Overview of Forest Management Policy and Mabira Forest Reserve

As a preliminary step for reviewing the forest resource utilization of the people living in the surrounding areas of the forest, this section will begin by offering an overview of forest utilization and management in Uganda by using administrative data as

reference. Then it will present a summary of the forest protection policy followed by a study focusing on the Mabira Forest Reserve which is located in the region where this survey was conducted.

1-3-1 .Overview of Forest Utilization and Management

Among the forest land in Uganda, public, customary and private land accounts for 60% while national forest/permanent forest estate accounts for 40%. This 40% consists of forest reserves (16% of forest land) and wildlife reserves (24% of forest land) (Table 1-8).[15] National forest is divided into that for production and that for protection. In terms of vegetation, the former consists of savannah bushland, grassland and woodland. It is a source for forest products as well as a place for planting trees for the future. Meanwhile, the latter includes national forests that include all tropical high forests, savannah woodland and grasslands that are protected to maintain watersheds, water catchments, biodiversity, ecosystem and landscape.[16]

However, forests in Uganda are diminishing conspicuously in recent years compared to neighbours such as Kenya and Tanzania. According to the National Biomass Study Project conducted in 2003, forest area per capita is estimated to decline from 0.003 square kilometres in 1991 to 0.001 square kilometres by 2025. The rate of decrease of forest cover area over the period of a decade from 1990 to 2000 is considerably higher in Uganda at 1.9% compared to 0.3% in Kenya and 1% in Tanzania. In the five-year period from 2000 to 2005, Uganda's forest cover decreased by 2.2%, surpassing Kenya and Tanzania at the rate of decrease at 0.3% and 1.1%, respectively [17].

Table 1－8 Registlated gazetted forest (㎢)

	Government-owned/Permanent Forest Estate		Private Forest Land	Total	%
	Central and Local Forest Reserves	National Parks, Wildlife Reserves, Controlled Hunting Areas	Public, customary and private land		
Tropical High Forest	3,460	2,280	3,510	9,250	18.9
Savannah Woodland	4,230	9,500	26,020	39,750	81.1
Total	7,690	11,780	29,530	49,000	100
%	15.7	24.0	60.3	100	

Source： Mukiibi, J. K. （2001） *Agriculture in Uganda Vol.3 Forestry* . Fountain Publishers.

1-3-2. Summary of Forest Management Policy Since the Colonial Period

Government control of "forest resource management" began in Uganda during the initial period of the British protectorate. It began when the King of Buganda agreed to prohibit cutting of trees in forests without permission in the Buganda Agreement signed in 1900.

The policy concerning the forest was enacted in 1929. The policy put in place the three proceeding points shown below and asserted that Uganda's state forests could be

[15] See Mukiibi, J. K. (2001) *Agriculture in Uganda Vol.3 Forestry*. Fountain Publishers.
[16] See National Forestry Authority(2005) *Uganda's Forests, Functions and Classification*. P.2
[17] For the African Continent as a whole, forest area diminished by 0.64% in the 10 year period from 1990 to 2000 and 0.62% during the 5 year period from 2000 to 2005. See FAO(2007) *State of the World's Forests 2007*. Food and Agriculture Organization of the United Nations. P.5 and pp.109-110..

managed in a financially sustainable way, i.e. the best financial return for the investment made for its management. The three proceeding points were, 1) to retain under forests (under growth) or afforest all areas of land, the retention of which under (growth) forestry is considered necessary on climatic or other indirect grounds; 2) to meet with due to regard to vested rights such as the demands of the population of Uganda as cannot be met by individual or local administration efforts; 3) to advice individuals and local native administrations in all matters pertaining to arboriculture or forestry.[18]

Since then the policy has gone through four revisions but its basic line has not changed to date. A revision stressing thorough training of local staff was carried out in 1939, ten years after the policy was announced. This policy revision made local administrations eager to be involved in forest management. Another revision supplementing the involvement of local administration in forest management was put forth in 1948. Following independence in 1967, forest reserves whose jurisdiction had been separated between central and local were integrated into single (central) jurisdiction, making it impossible for local administrations to be involved in the management of forest reserves with the exception of several village forests. Revision of policy in accordance with this reorganization of jurisdiction was carried out in 1970. The revision that took place in 1988 took into account the production side oriented towards securing lumber for export and the balance between internal demand and external demand, and the protection of the forest ecosystem.[19]

This policy continued from the early protectorate period almost until the end of the 20th Century under the initiative of the Forestry Department of the Ministry of Agriculture, Animal Industry and Fisheries. Although there was some shift in priority concerning the authority of management between the local and central government, the basic stance up to now has been consistent in that the government basically manages the forest. In reality, however, logging of forest resources in national forests has been accelerating with some data indicating that the area of forest was reduced by half during the 50 years from the signing of Buganda Agreement in 1900 to independence in 1958.[20] Table 1-9 shows the area in the forest reserve that was encroached by reclamation and other reasons as of 1990. Mabira Forest Reserve where this survey was conducted had the second largest area of encroachment.

Activities of farmers other than reclamation that affect such diminishing of forest includes use of forest resources for firewood and charcoal in rural areas. Table 1-10 shows the consumption of fuel energy in Uganda. One can see from this table that the majority of energy sources such as petroleum and electricity are consumed by industry, commerce, transportation and public facilities, (compared to households) although

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[18] The following booklet was used as reference for the full text of this policy. Karani, P.K. (1994) *Sustainable Management of Tropical Rain Forest in Uganda*. Commonwealth Secretariat.

[19] See Mukiibi, J. K. (2001) cited above, for changes in policy after the protectorate period.

[20] According to Hamilton, A.C. (1984) *Deforestation in Uganda*. Oxford University Press with The East African Wild Life Society., p.13, the area of "forest and moist thicket" decreased from 30,901 square kilometres in 1990 to 11,176 square kilometres in 1958. Because this booklet does not show a clear definition of 'forest and moist thicket', the reason for variance with "forest area" from FAO at the beginning of Chapter 1 is unknown. As will be mentioned later in this text, it must be noted that destruction of forest in Africa was generally accepted throughout the colonial and protectorate periods.

even these sectors are still dependent on fuel from biomass resources to a certain extent. While the energy used in urban and rural homes accounts for 87% of entire energy consumption, majority of this energy is supplied by biomass resources. Since manure is rarely used for fuel in Uganda, "fuel from biomass" used at homes in this text refers to firewood collected from forests and charcoal produced from such firewood. As it is difficult to use forest resources directly in cities, charcoal brought from rural areas is used as fuel except for homes that have access to other forms of energy such as electricity. In this manner, the commercial use of forest resources through the selling of charcoal to nearby local cities increased as well as from collection of firewood for home use with the rise in demand for cash in rural life.

The government has carried out administrative restructuring in cooperation with Department for International Development (DFID), Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ), UNDP and FAO since 1990, and the Forestry Department of the Ministry of Agriculture, Animal Industry and Fisheries (Ministry of Agriculture) which had national forests under its jurisdiction for many years was abolished as part of such effort. The reason for abolishment was the inability of the Forestry Department to demonstrate sufficient administrative ability amidst the growing need for appropriate management of diminishing forest reserves in the country. As a result, the Forestry Inspection Division, the National Forestry Authority (NFA) and District Forestry Services were established. [21]

Among them NFA was established as the central organization to replace the abolished Forestry Department and has maintained enormous influence on the national forest management policy to this day. NFA is regulated by the National Forestry and Tree planting Act, Section 52, 2003 and was inaugurated in 2004. This act defines various stakeholders related to the forest, i.e. the roles, the responsibilities and the rights of the newly inaugurated agencies, the residents of regions where forest research is located, and the location of administrative agencies, and guarantees the method through which each of these entities living there discuss the issues concerning forests.[22]

[21] Similarly, Ministry for Water, Lands and Environment was created as a new relevant ministry as a result of this reorganization.
[22] See NFA (2005) *Uganda's Forests, Functions and Classification*. National Forestry Authority. And Ministry of Water, Lands and Environment & DFID et al. (1999-2004) *Uganda NFP Process Learning Series* note 1- 8.

Table 1－9 Forest Reserve Encroachment 1990

Forest reserve	District	Encroachment (km²)
Mt. Elgon	Mbale and Kapchorwa	310
Mabira	Mukono (reseach area)	100
South Busoga	Iganda	60
Bukaleba	Iganda	45
Bwezigola Gunga	Kiboga	35
Kiboga	Kiboga	20
Kisangi	Kasese	10
Kibale	Kabarole	5
Bile Bank	Jinja	3
Kagoma	Jinja	3

Source: Mukiibi, K. J. Ed.(2001) *Agriculture in Uganda Volume 3; Forestry*. Fountain Publishers, CTA and NARO.

Table1－10 Energy Consumption in Uganda （%）

Sector＼Type of energy biomass	petroleum	electricity	Total
Household	86.9	0.3	0.6	87.8
Industrial	4.6	0.6	0.8	6.0
Commercial	2.8	0.3	0.4	3.5
Institutional	2.2	0.1	0.2	2.5
Transport	0	0.2	0	0.2
Total	96.5	1.5	2.0	100

Source: UNDP/ESMAP（1996） *Uganda Energy Assesment UNDP/ESMAP, Joint UNDP/World Bank Energy Sector Management Assistance Programme*. (Draft Document).

1-3-3. Community-Based Forest Management (CBFM)

One possible reason for the inauguration of NFA, aside from the dysfunctional former Forestry Department, was as a response to the global paradigm shift concerning the principles of forest resources including national forest protection and management. Sustainable development became an important concept of development aid in the 1990s. One of the issues of pressing necessity was resource management for developing countries which became the priority item for the governments of the aid-receiving country as well as for donor countries and organizations.

It was in this context that a major shift in the principle from the basic line “fortress conservation”[23] which saw natural resources as a source of materials and the subject of control from the viewpoint of the central government, to seeking the path for sustainable use with consideration for the livelihood of the local people that are “utilizing” those resources on a daily basis. This approach called “community-based natural resource management” views the central/local government, relevant authorities and residents as stakeholders that utilize and manage the same forest in accordance with the existing situation of resource utilization in the community and places

[23] A term used by Adams and Hulme. Adams, W. M. & Hulme, D. (2001) Conservation and communities: changing narratives, politics and practices in African conservation. In Hulme, D. & Infield, M. *African Wildlife and African Livelihoods: The promise and performance of community conservation*. James Currey.

importance on participation of residents in the decision-making process. For this reason, it is also referred to as "participatory natural resource management." In the context of resource management, it was implicated that the concept of "sustainable development" has two goals that traditionally have conflicting interests of "conservation" and "development". It was decided that various stakeholders including community residents would participate in this exploration process.

The concept of community-based natural resource management and its policy implementation has given rise to various discussions. An attempt will be made in this section to introduce and streamline some of the discussions taking place. Community-based natural resource management involving wildlife and forest resources in Africa places the initiative of resource management not only on the government but also on local residents. Such shift in balance is said to have an effect of "creation of community initiative". It asserts the need for government and respective agencies to promote empowerment of local residents as "citizens" that have been granted the rights and responsibilities concerning natural resources instead of seeking to forcefully divide "resources" and "residents" by seeing local residents as ignorant exploiters of their surrounding natural resources.[24]

However, the roles and positioning of community and local residents differ from one proponent to another. Some are of an extreme view that various rights (including ownership) and responsibilities concerning the resources should be put entirely in the hands of local residents. Examples of countries that have adopted policies reflecting this stance, that places complete confidence in the potential of community, can be found in Namibia and Zimbabwe.[25] On the other hand, there are countries that position local residents as mere "neighbours" as opposed to "procreators" of natural resources that are subject to conservation and set the final goal on building good relationships between people and adjoining reserves. An instance similar to this approach can be found at Mgahinga Gorilla National Park in Western Uganda.[26]

In addition, contrasting stances also exist with regard to the natural environment; some assert that utilization of resources should be tolerated provided that it does not damage the overall ecosystem including hydrological cycle and renewal of soil productivity while others view based on biodiversity fundamentalism, contends that any resource utilization that hinders biodiversity should be controlled. This stance argues that utilization shall be limited to indigenous utilization practices that may end up holding back the preferences for development among the users.

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[24] Hulme and Murphree developed a forward-thinking discussion on community resource management by using a case study of wildlife protection in Africa in 2000. See Hulme, D. & Murphree (1999) Communities, wildlife and the 'new conservation' in Africa. *Journal of International Development.* Vol.11 pp.277-285, and Hulme, D. & Murphree(2001) Community conservation in Africa: An introduction. In Hulme, D. & Infield, M. (2001). pp.1-8.

[25] See Jones, Brian T. B. (1999) Policy lessons from the evolution of a community-based approach to wildlife management, Kunene Region, Namibia. *Journal of International Development*. Vol.11. pp 295-304 for case study in Namibia, and Murombedzi, James C.(1999) Devolution and stewardship in Zimbabwe's CAMPFIRE programme. *Journal of International Development*. Vol.11. pp. 287-293 for case study in Zimbabwe.

[26] Infield, M. & Adams, W. (1999) Institutional sustainability and community conservation: a case study from Uganda. *Journal of International Development*. Vol.11. pp.305-315.

Many programs that have been made into policies and implemented reflect a more conservative stance compared to the extremes described above. As will be mentioned later, forest management policy has caused a turnaround in the direction of seeing local residents as its stakeholder in Uganda. However, the adopted policy emphasized coordination with administration and other stakeholders instead of entrusting excessive initiative in the hands of the residents.

At the backdrop of the institutional transition mentioned earlier in Paragraph 1-2-2 of abolition of the former Forestry Department and inauguration of NFA was a policy implication of developing institutional aspects for making the transition in forest resource management to community-based forest management (CBFM). It was the 2001 Forest Policy announced prior to inauguration of NFA by the Ministry for Water, Lands and Environment that first told of this paradigm shift of forest resource management policy in Uganda. Statement 5 of this policy proposed the Collaborative Forest Management (CFM) that promoted active participation of communities adjacent to forests in forest management.[27]

This policy advocates an appeal for a new policy framework by indicating that the old forest management policy led by the Forestry Department promoted the depletion of forests for two reasons, 1) strict exclusion and surveillance it imposed against the residents while accepting economic use by companies, and 2) lack of effectiveness of surveillance and management it imposed.[28] The framework proposed as a result was CFM, and NFA was established subsequently as the main government agency for collaborating with local residents and other stakeholders under this framework. (See Section 1-4 and Figure 1-4 below for agencies involved in the implementation of this framework.)

However, partly due to the fact that it is only five years since the inauguration of NFA based on the National Forestry and Tree planting Act in 2003, policy implementation of CFM (which is the framework for policy shift towards CBFM in Uganda) has only just begun and attention must be given to its future trends. Actual challenges and activity implementation of newly formed agencies will be described in Sections 1-3 and 1-4 using data obtained from interviews conducted at relevant organizations. The next section will offer an outline of Mabira Forest Reserve in Mukono District where the survey was conducted.

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[27] See Ministry for Water, Lands and Environment (2001) The Uganda Forestry Policy. Republic of Uganda, for details of this policy. As for "collaborative management" between central government and local residents with regard to forest reserves in Africa, also refer to the following paper which actively evaluates this subject. Hamada, Tetsuro (2005) "Towards implementation for Collaborative Management of Forest Reserves: Examination of the Approach on Development and Forest Conservation in Africa" *Kokusai Kyoroku Kenkyu*, Vol21, No.1 JICA. The concept of CFM is also substituted by other names and expressions including "participatory management," "multi-stakeholder Management", "joint management", "shared management" and are quoted as similar management methods in the said document.

[28] See Ministry for Water, Lands and Environment(2001) cited above.

1-3-4. Overview of Mabira National Forest Reserve (MFR)[29]

We conducted our survey in villages adjoining the Mabira Forest Reserve (MFR). MFR is located in Mukono District and is situated along Jinja Road, an asphalt-paved arterial road that connects the capital city of Kampala with the second largest city of Jinja. Located at a distance of 52 kilometres from Kampala and 28 kilometres from Jinja, it is the closest forest reserve to an urban area in Uganda. MFR has a total area of 312.93 square kilometres and consists of Mabira, Namakupa, Nadagi, Kalagala Falls, Namawanyi and Namananga Forests. (Table 1-11) Starting with the registration of Mabira Forest and Namakupa Forest during the protectorate period in 1932, the reserve was gradually expanded until it reached its present area.

MFR's boundaries are demarcated and can be identified relatively clearly even from a distance. It is a secondary forest ecologically classified as moist semi-deciduous forest that has been greatly affected by human activities including logging, cultivation and grazing. Further subclassification of vegetation includes young or colonising forest, mature mixed forest and *Celtis* forest (forests dominated by six varieties of hackberry).

It is said that expansion of farmland accompanied by intrusion into MFR was particularly active in the 1970s. The predominant view is that it occurred as a result of "lawlessness" amidst political-economical instability under the Amin administration. President Amin carried out national mobilization to increase domestic production of agricultural products during his term, announcing in 1974 that Ugandan citizens can migrate to any part of the country. The vast forest reserve offered a once-in-a-lifetime opportunity for a free frontier for the people, and the MFR had at one time a gathering settlers from Buganda and its adjacent areas to clear the forest and build a rural enclave colony in the forest. [30] In 1988 and 1989, however, President Museveni mobilized the government troops soon after coming into power to relocate the residents of the forest (who were regarded as the cause of forest destruction at the time) by force. Some 27 villages including those that are complete enclaves surrounded by forest and those with their peripheries partially edging into the forest still exist today in MFR. Some say that as many as 50,000 people live in these enclaves.[31]

Management plans for MFR had been prepared by the Forestry Department of the Ministry of Agriculture, Animal Industry and Fisheries over a period of three 10-year terms from the protectorate period to present. These plans will now be reviewed. In the first term management plan from 1948 to 1957, emphasis was placed on exploring the method for producing a certain volume of lumber on a sustainable basis and a plan was initially made to limit logging of designated tree species to 4,323.6 cubic metres (later increased to 7,566.3 cubic metres after a study). Logging of species other than those designated including hackberry was permitted without any limit. MFR issued a license that permitted logging to certain lumber and cotton producers that logged

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[29] The following was mainly used as reference with regard to outline of MFR National Forest Reserve; Ministry of Natural Resources(n.d.) *Forest Management Plan for Mabira Forest Reserve, Mukono District- Uganda*. 2nd Edition. For the Period 1st July 1997 to 30th June 2007. EC and Forest Department.

[30] The lumber and cotton producers with Indian capital involvement mentioned earlier were forced to leave the country in 1972 due to this exclusive policy by President Amin.

[31] Alima & Kahembwe (1995) *The possibilities for the joint management of Mabira Forest Reserve in Uganda*.

46,758 cubic metres of lumber over a period of three years from 1953 onward. Tree planting based for forestries was carried out from 1948 to 1954 and attained certain success in recovering the logged forest, but the project faltered in 1954 because of financial loss. A selection system for displacing unwanted tree species in the forest was carried out thereafter but was also discontinued in 1957 when it was found in subsequent studies that the system was not effective in maintaining optimum consumption and recovery

The second management plan from 1961 to 1971 inherited the goal of the first term. It designated 16 experimental plots to carry out research on an ongoing basis in addition to managing the reserve by dividing it into 60 zones. Logging of designated species was set to 11,313.5 cubic metres per year and the aforementioned license issued to lumber and cotton producers were continued. The second management plan expired in 1971 and was not revised until 1994 as the country entered a period of political-economic instability thereafter. Retrospection that "logging became active in the 1970s" appears to be based on lack of effective management planning and the foregoing freedom of migration for production increase issued by President Amin. Incidentally, there was a case where a company owning a tea plantation obtained a license to harvest firewood for a period of 40 years from a single zone in 1983. Meanwhile, illegal logging by residents living in the vicinity to produce charcoal for commercial purposes began before the 1990s but the government regulation that started in the 1990s proved to be effective to a certain point.

In 1994 and 1995, optimizing the ecosystem of the forest and its surroundings by maintaining conservation of flora and fauna in forest and continuity of forest, as well as sustainable use that takes into consideration conservation of forest landscape were laid out as goals. And it was recognized that participation of residents living in the vicinity of MFR in realizing these goals should be urged.

Several rules concerning the use of the forest by the people living in the vicinity of MFR were stated in the Forest Management Plan for Mabira Forest Reserve which was prepared for the third 10-year term that started in 1997. For instance, people living in the vicinity of MFR are allowed free access to dead and fallen trees for firewood in addition to the use of honey, mushrooms, medicinal plants and use of trees and vines for building purposes. For many years, there was a tendency to view the people in the vicinity of MFR as "a problem" because they cut trees for firewood, hunted wild animals and engaged in deprivatory use of forest by land clearing. It is only recently that the aforementioned paradigm shift concerning forest management is being reflected in the management system of MFR. At the root of this plan is a conviction that community residents will become the central actor in sustainable forest resource utilization as long as there is incentive for proper advocacy and conservation.

At present, the National Forest Authority (see Paragraphs 1-3-2 and 1-4-1) has a branch office in MFR and is involved in the utilization and management of forest resources.[32] An article introducing MFR on the NFA website appeals for the retention of biodiversity in the MFR.[33] Its biota consists of 312 species of trees including rare plants and useful medicinal plants, 315 species of birds, 218 species of butterflies, 97 species of moss and 23 species of small mammals. It is a sign of NFA's stance to

[32] A member from Japan's JICA was stationed at this NFA's MFR Branch at the time of our survey in October 2007.
[33] See http://www.nfa.org.ug/tours.php

promote eco-tourism in the country's forest reserves particularly in MFR (also see Section 1-4). A sign that says "Mabira Eco-tourism Centre" is standing at the corner of MFR's entrance. The Centre offers eco-tours and sells handicrafts made by local women. (Photo 1-5)

On the other hand, utilization of forest products in MFR by companies has been accepted under a license system. In the case of MFR, the license is issued only to companies[34] and the licensed companies will be permitted to log harvest trees among the trees growing in production zones of plots inside the reserve. Seed trees and reserved trees cannot be logged. This license is currently held by Nile Ply Ltd. which is the only plywood and veneer manufacturer in the country.

In considering the forest resource management system in Africa, it is difficult to strike a balance between conservation and development. However, the NFA branch in MFR is implementing forest resource conservation and maintenance activities while generating funds for operation of the reserve by permitting such large-scale commercial use under certain conditions and offering materials for domestic industries. Its main activities for conservation and maintenance include control of illegal logging, promotion of tree planting activities and conducting ecological studies.

At MFR, NAF branch staff patrol the reserve on a regular basis to regulate illegal use of forest resources. The branch also engages in public relations activities through radio to raise the awareness ("sensitisation") of local people about tree planting. At the same time, it is distributing seedlings by working with local councils of respective regions to promote tree planting in the surrounding rural areas. The branch staff told us during the field survey that its major goal lies in organizing the integrated approach of a number of communities adjacent to the forest reserve through these steady efforts. Implementation of ecological research with regard to forests inside the reserve would constitute an important challenge for the future. In concrete terms, NAF aims to implement the exploration of plots inside MFR and prepare a stock map showing the tree species growing in these plots and their location. However, there are no current prospects with regard to procurement of funds for conducting the research and acquiring equipment such as GPS and GIS, nor for training their staff for ecological study using this equipment, and the measures for their realization are being explored by communicating with respective forest reserves and related agencies. (See Paragraph 1-4-1 for the purpose of establishment for NFA Headquarters and its overall activity implementation.)

[34] The license system differs from one reserve to another. For instance, license is based on a bid in which individuals can participate at Bugoma Forest Reserve in Western Uganda.

Table 1－11　Area of Mabira Forest Reserve

in MFR	area　(k㎡)
Mabila	299.74
Namakupa	2.80
Nadagi	4.79
Kalagala Falls	1.04
Namawanyi	3.25
Namananga	1.31
Total	312.93

Source：Ministry of Natural Resources[n.d.] *Forest Management Plan for Mabira Forest Reserve, Mukono District- Uganda . 2nd Edition. For the Period 1st July 1997 to 30th June 2007.* EC and Forest Department.

Photo 1-5 Entrance to Mabira Forest Reserve near Najembe Local Market.　NFA's sign has the words "Mabira Ecotourism Centre" on it.

1-4. Roles and Approaches of Forest Management Organizations

As we have seen so far, forest management in Uganda today encourages active participation of local residents in the vicinity of forest reserves and seeks to strike a balance between utilization and conservation through collaboration over matters related to the forest among stakeholders and administration (relevant government agencies). Two administrative organizations involved in this scheme are introduced as follows.

1-4-1. National Forestry Authority (NFA)

As shown in the earlier Paragraph 1-3-2, NFA assumed the role of managing national forests in 2004 and has 506 Central Forest Reserves under its control as of 2005.[35] It is a semi-autonomous body under the supervision of the Ministry of Water, Land and Environment employing 380 staff at the time of this survey. It mainly works with Uganda Wildlife Authority (UWA) and is working on their mutual capacity building with regard to community-based forest management methods.

The mission of NFA includes, 1) improvement of Central Forest Reserves management; 2) building partnerships with stakeholders; 3) offering high quality forest products and services; and 4) sustainable procurement of finances for forest management. It has formulated a system of cooperation with the private sector (private companies, NGOs, community organization, individuals), central government and local governments to fulfil these missions. Its wide-ranging activities are introduced briefly below.

1) Actual activities towards the improvement of Central Forest Reserves management include: 1) improvement of management plan; 2) demarcation of forest reserves; 3) recovery of excessively logged regions through tree planting; 4) preparation of coordination system for forest management with stakeholders; 5) assessment of forest resources or forest products; 6) preparation of regulations and guidelines; 7) regulation of illegal entry (Table 1-12); 8) supervision and surveillance of forest resource utilization; and 9) promotion of tree planting to secure the supply of forest products.[36] In particular, investing in forest reserves for purposes other than forest requires a revision of the law. In such cases, the party investing in the reserve first submits its application to NFA. The application then goes through a long process of changing hands to the central government, Ministry for Water, Lands and Environment, cabinet meeting and relevant committees and finally Diet passage for legal revision to be executed and the matter to move forward.[37]

2) Coordination with communities adjacent to Central Forest Reserves is being sought through partnership building. At present, Collaborative Forest Management (CFM) has been introduced on a pilot basis at forest reserves in Mabira, Budongo and Namatale. As explained in Paragraph1-3-3, CFM serves as a framework for NFA to strive for sustainable use and conservation of forests with the residents of regions surrounding the forest and other stakeholders (e.g. government, NGOs, forest rangers and managers). In this framework the CFM Plan is formulated mainly by the community organization. The content of collaborative management

[35] NFA(2005), "Guidelines for Land Allocation In Central Forest Reserves".
[36] From NFA Official Website.
[37] The procedure was obtained from the hearing survey.

is defined officially and in detail through an agreement entitled Collaboration Agreement between NFA and the organization in question. NFA guides and supervises those field activities and performs forest conservation management with local residents including a review of its activities. (See the flowchart in Figure 1-4 for details.) In the past, there was conflict and distrust between management authorities and residents with regard to the perception and attitude concerning forest conservation. The introduction of CFM is an experiment of a new framework that brings the two closer and realizes maintenance and management through cooperation with the community which is most closely involved with the forest. As of 2004/05, 6,498 hectares are under the management of CFM, involving 1,757 households.

At Buvuunya Village, the pilot project for Mabira Forest Reserve in the CFM framework was under way at the same time the survey was being conducted. NFA was carrying out its forest conservation program under cooperation with a Community-Based Organization (CBO). CBO is playing the role of an organization for residents in implementing CFM in this case.

In addition, civil society organizations (CSOs) such as Nature Uganda、African 2000 Network and ACODE[38] as well as non governmental organization (NGOs) are playing the role of connecting NFA and villagers. Although NFA and villagers were sceptical about each other in the past, a good relationship arose between the two since they started working together towards forest conservation with the help of CSOs and NGOs. NFA now admits that it is learning a great deal from the residents.

3) Provision of high-quality resources and services includes mapping using GIS, offering of seeds and seedlings, and granting licenses to utilize forest products. Tree species that are procured for seed and seedling provision programs are mainly Pines and Eucalyptus, and high-quality seedlings of an improved variety are imported from South Africa and Tanzania. When granting a license to use forest products, transparency is increased through introduction of a competitive auction system. Activities for offering finite forest products on an ongoing basis are also needed. Saw-log Production Grant Scheme (SPGS) is being implemented through support from the EU for this purpose.

4) Securing of financial resources is the present challenge that NFA faces. In the early years, it received support from donors including the Norwegian Royal Family and EU. Today, it is operating on its own funds by generating revenue from license issuance, sales of seeds and seedlings and sales of forest products such as timbers including those impounded as well as processed by NFA. However, it must create an even more stable fund earning structure in order to develop its numerous projects described above without interruption.

   In this sense, eco-tourism is a very important project because it is one of the sources of income for NFA. With an area of 306 square kilometres, MFR is one of the vast

[38] ACODE: Advocates Coalition for Development & Environment. A local think tank NGO engaging in research, study, advocacy and endorsement activities in connection with the issues of development and the environment. Is in cooperation with the UNFFE and parliamentarians' forums and is actively involved in maintenance of forest reserves in the environmental arena.

natural forests in the country where forest tours and cycling events for enjoying observation of abundant tree varieties, wild birds and butterflies are being offered. Implementation of such eco-tourism programs is generating opportunities for local residents to get cash income as tour guides, music and theatre entertainers, and manufacturing and sales of handicrafts for souvenirs. In other words, eco-tourism is a scheme that enables residents to enjoy the blessings from the conserved forest in addition to offering activity funds for NFA from its profit. Realization of sustainable forest conservation and forest utilization is therefore sought by creating an incentive scheme for residents towards forest conservation.

Table 1-12 Seized Illicit Natural Resources and Tools

Forest resource	amount
wood	4,230 ㎥
charcoal	3,218 sacks
firewood/board/billet	30 trucks
earth and sand	13 trucks
tool	
chain saw	35 items
saw	135 items

Source: National Forest Authority.

1-4-2. National Environmental Management Authority (NEMA)

In contrast to the NFA which is engaged in conservation and management of the forest, NEMA is in charge of Uganda's natural environment in general and a subordinate organization of the Ministry for Water, Lands and Environment. It was created under the National Environment Act Cap 153 for the purpose of preparing the State of Environment Reports issued once every two years as well as an appeal and popularization of environmentally friendly practices based on these reports.

State of Environment Report was first issued in 1994. Since the baseline study report on the domestic natural environment in 1994, it has been researching and reporting on the availability and challenges concerning environmental resources and their causes; the actual problems such as reduction of agricultural production, decline of forest cover area, water pollution and excessive harvesting of fishery resources and their impact on the natural environment; and their relationship with the aforementioned PEAP and PMA.

Furthermore, NEMA is currently playing the role of supervising and guiding all kinds of measures concerning the natural environment while offering advice and recommendations to the central government. NEMA has a cooperation system with the central government and local government (district-level) because coordination among parties involved is one of its roles in implementing these projects. A regular meeting is held once a year in partnership with district councils, with NEMA offering guidance and supervision so that policies decided by the central government would be implemented in a desirable form in districts empowered with authority as a result of decentralization. In addition, NEMA frequently holds seminars, workshops and community meetings as part of the support it offers. NEMA rarely approaches administrative divisions subordinate to districts directly (particularly local residents)

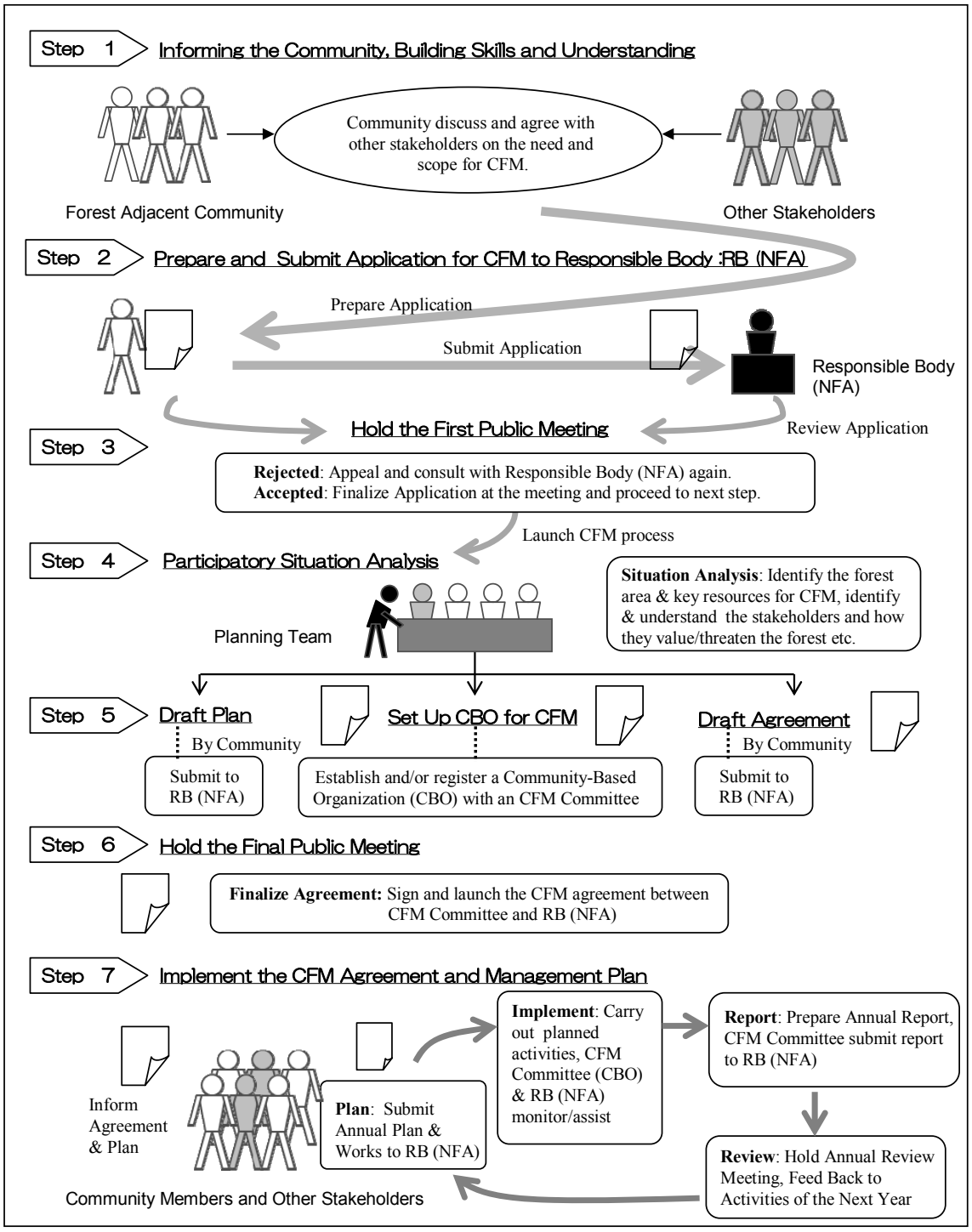


Fig1-4. Flow chart of the Procedure of CFM (Collaborative Forest Management)

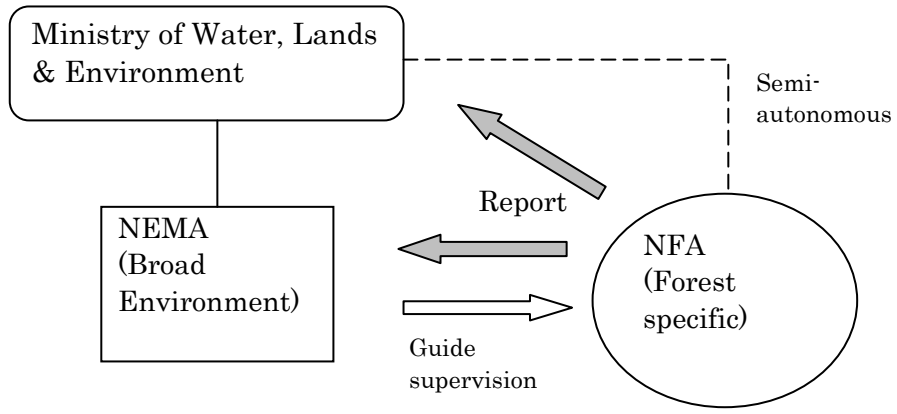
Source: National Forest Authority(2003) *Guidelines for Implementing Collaborative Forest Management in Uganda.* 12p. revised by authors

administrative divisions subordinate to districts directly (particularly local residents) but does sit in on their discussions with district councils and environmental officers sometimes.

In addition, NEMA shows public recognition of residents who have worked hard in tree planting activities. For instance, a forestry farmer had been promoting planting of 50 varieties of trees including fruit trees in an agro-forestry project for almost 10 years since 1991. As a result, the number of seedlings he planted reached 3 million and NEMA gave him an award for his commitment and activities. Such acclaim and commendation of efforts also attract the attention of other residents. These commendations are recognized as presenting a non-monetary incentive[39] and are expected to increase people's motivation towards forest conservation.

NEMA is also in the position of offering guidance and supervision to NFA. As we have seen, NFA is mobilizing its agencies to implement its projects, and the reports of such projects are presented to NEMA and the central government every 14 days within a collaborative scheme. (Figure 1-5)

Figure 1－5 Institutional Relationship for Forest Management



Source：Interview

[39] Cornelius Kazoora (1999), "Opportunities for Using Economic Instruments in Sustainable Management of Forests in Uganda", Sustainable Development Centre.

Chapter 2　Results of Field Survey

The field survey was conducted from early- to mid-October of 2007[40] . Most of the research was conducted in the initial stage of the trip to Uganda consisting of visits, interviews and data collection from relevant authorities, administrative/research institutions and NGOs in the capital city of Kampala with the field survey of rural areas being undertaken during the latter half of the visit. The results of the first part of the survey are as described in the previous chapters. This chapter will discuss the results of the field survey carried out in the latter half. The rural survey was conducted in three villages and their immediate vicinities in Najembe Sub-County, Buikwe County of Mukono District. Let us begin by reviewing the region where these villages are located and their socioeconomic conditions and then proceed to an overview of the survey method and each surveyed village.

2-1. Overview of the Region

2-1-1. Town of Lugazi in Mukono District

Mukono District is located between the capital city of Kampala District to the west and the second largest city of Jinja District to the east, and has a population of 892,359 and an area of 12,437.48 square kilometres. Jinja Road, an asphalt-paved arterial road connecting Kampala and Jinja, runs in an east-west direction through the centre of the district and offers good access to the cities. Mukono, the district capital (population 45,000) and the small town of Lugazi (population 31,000) are located along this arterial road. A railroad continuing on from the neighbouring country of Kenya also runs through Lugazi which has been a key logistical junction between Jinja and Kampala since the colonial days. While the majority of population is engaged in agriculture, a certain percentage of the population is employed full-time or part-time in manufacturing. The main manufacturing industries in the district mainly consist of wood furniture, cotton textile, processing faculties for coffee, tea, cacao, sugar and feed, and grain milling.[41] Among these, currently contributing enormously to the district economy is the sugar mill.

The town of Lugazi is located in Buikwe County, one of three counties in Mukono District, and is home to the Sugar Corporation of Uganda Ltd. (SCOUL) that takes up approximately 100 square kilometres of land which partially overlaps with the town's total area of 19.2 square kilometres. The sugar mill was built in 1924 by the Indian corporation Metha Group and hence has one of the longest histories in East Africa. It offers over 7,300 jobs in Uganda,[42] and is widely known among the people under the name of "SCOUL" or "Metha". Along with Kakira Sugar Ltd., an another Indian investment that has a mill in the neighbouring district of Jinja, SCOUL is one of the two largest sugar mills in Uganda and shares the domestic sugar production with

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[40] See the field survey schedule in Appendix.

[41] Fountain Publishers (2002) *Uganda Districts* (5th Edition) . Fountain Publishers Ltd

[42] See SCOUL's website (http://www.mehtagroup.com/sugar.htm) . According to Uganda Bureau of Statistics (2002) *2002 Uganda Population and Housing Census Reports* Uganda Bureau of Statistics, 7,461 (9.38%) out of 795,393 persons are institutional population. Majority of these people are believed to be living in SCOUL's company housing.

Kakira (Table 2-1).[43]

Table 2－1 Sugar Production in Uganda 1998-1996

	SCOUL	Kakira	Kinyara	Total
1988/1989	7,535	0	0	7,535
1989/1990	15,300	10,500	0	25,800
1990/1991	27,000	8,400	0	35,400
1991/1992	26,100	20,700	0	46,800
1992/1993	27,000	26,900	0	53,900
1993/1994	27,000	27,200	0	54,200
1994/1995	29,300	23,900	0	53,200
1995/1996	30,000	54,000	4,000	88,000

Source: Export Promotion Board (1995); Mukiibi J. K.(2001) Agriculture in Uganda Vol. 2 Crops.

Mukono District, including Lugazi, has a large migrant population from other districts that are hired as factory workers. The Baganda and Basoga ethnic groups constitute the main original settlers in Mukono District. While the two groups still account for the two largest ethnic populations in the district today, the influx of factory workers has resulted in a mixed population composition consisting of many ethnic groups such as Bagisu, Jopadhola, Iteso and Samia.[44] SCOUL is not only a tax revenue for Lugazi but also contributes to the local community in the realm of welfare through the hospital attached to the factory and primary and secondary schools it assisted in opening.

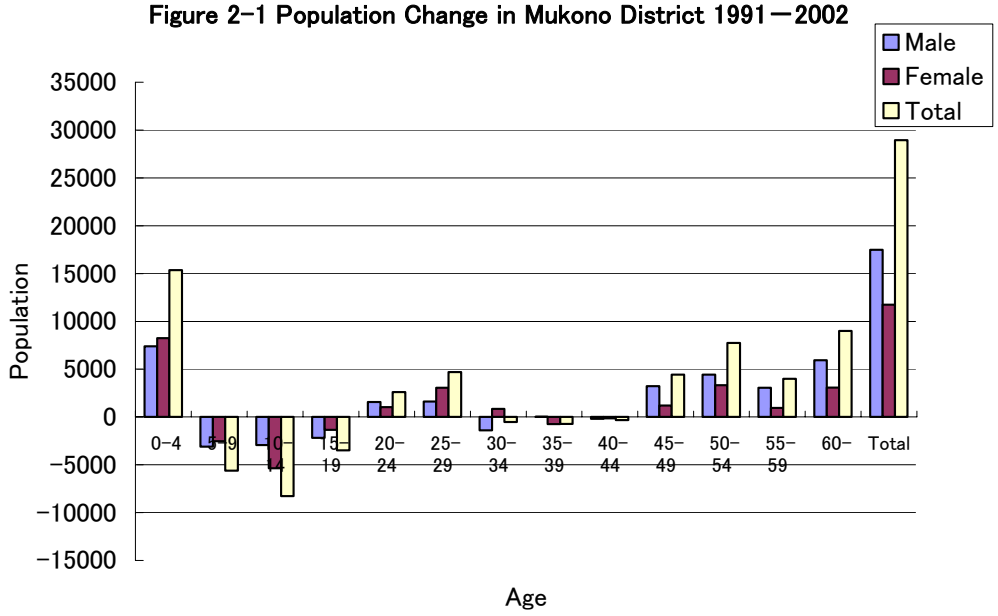
2-1-2. Population of Mukono District

Size of population, its changes and density
According to the 2002 Census, Mukono District in Central Uganda is a region with a relatively large population size. As with other regions, it has a triangular-shaped population composition in which the youth population accounts for the highest percentage with the ratio declining with higher age.

When studying this region, however, attention must be given to the fact that the population of youth is declining. A look at demographic changes by age group in Mukono District between 1991 and 2002 shows that the population is increasing for ages 0 to 4 in both genders while decreasing for ages 5 to 19, presumably as a result of migration for seeking employment or school attendance. Meanwhile, the slight decrease in ages 30 to 44 appears to be attributed to migration in search of jobs (Figure 2-1).

[43] See Yoshida, Masao (1997) "*Higashi Afurika Shakaikeizairon—Tanzania wo Chushin to Shite*," Kokon Shoin pp.112-118 and Ahliwalia, D.P.S. (1995) *Plantations and the Politics of Sugar in Uganda*. Fountain Publishers Ltd. For Indian capital in Uganda and historical and economic development of sugar industry.
[44] According to aforementioned Uganda Bureau of Statistics (2002),Ahliwalia, D.P.S. (1995)

Figure 2-1 Population Change in Mukono District 1991－2002



Source:Mukono District Council(2006)*Statistical Abstract2006*.

2-1-3. Najembe Sub-County

Existence of Mabira Forest Reserve (MFR) is a characteristic of the surveyed region that must be recognized in connection with the goals of this survey, i.e. grasping the realities of population increase, family budget of households and utilization of forest resources in rural areas. The rural area neighbouring this forest reserve was selected for this survey because of its close proximity to urban areas in Uganda.

Najembe Sub-County where the three surveyed villages are located has its office of LC1 approximately 10 kilometres east on Jinja Road from the town of Lugazi. A local NGO named Najembe Integrated Development Association (NIDA) has its office near the sub-county office. NIDA's activities at three parishes of the sub-county include offering various income generation methods such as poultry farming, dissemination of information about disease prevention and public health, reduction of fuel obtained from forest resources through use of "improved stove" and recommendation of microfinance to residents. The fuel efficient stove was observed by the survey team in several households near the sub-county office and poultry farm. NIDA is actively engaged in popularization of this improved stove for sustainable utilization of forest resources. Compared to the conventional "three stone" stove (Photo 2-1) used by many rural households, the fuel efficient stove (Photo 2-2) can save a considerable amount of firewood but has not yet been fully disseminated among rural households. NIDA staff expressed their desire to further popularize the improved stove and eventually engage actively in tree planting activities.

Residents of the surveyed villages are primarily engaged in agriculture because of their proximity to two large cities of Kampala and Jinja but also have various cash-earning opportunities outside of agriculture. Several microfinance establishments are available in Lugazi for farmers to provide start-up capital for those launching a new business (Photo 2-3). However, most farmers appear not to be taking

active advantage of microfinance services. The large number of school children leaving their school zone and living in neighbouring cities to receive primary and secondary education was also considered. (See Section 2-5 for actual survey results concerning these points)

Situated along Jinja Road is the permanent Najembe Market and a smaller periodic market called Lugalambo Market. Both local people and people travelling long distance on the arterial road visit Najembe Market to buy food. These markets are also the place where households of the surveyed village sell their crop. They also appear to be used frequently for selling matooke (cooking bananas) and *nakati* (Solanum aethiopicum) and maize in small portions.

Table 2-2 is a list of crops grown in the three surveyed villages. All villages were growing bananas and other crops through rain-fed cultivation and were not practicing slash-and-burn farming. This chapter will focus on prominent features of the survey villages. Details of the method of selling crops and economic situtation of the households will be described in the next chapter. Vast fields of matooke were observed during the survey of these villages therefore it was assumed that many households were growing this crop. However, the survey results showed that cassava is the largest crop grown by households in all villages. In addition to having a resistance to drought and being an emergency crop that grows in areas with poor soil fertility, cassava is an important crop in the annual food consumption cycle that complements the main crop and can be sold on the market.[45] Households in the surveyed region appear to be seeking food production and stabilization of livelihood through the production of cassava.

With regard to cash crops and commercial crops, despite their proximity within the same region, the preference for a particular cash crop is village specific. Nkaaga Village has an overwhelmingly high percentage of vanilla-growing households. The popularity of this crop here may be attributable to NIDA's active promotion of vanilla cultivation in this village and the leadership demonstrated by the Chairperson of Local Council One (LC1) in the cultivation of this crop. On the other hand, Kinoni Village has many households that are growing sugarcane for sugar production and there were no households among the sample households that grow *nakati*. It is difficult to determine the reasons behind these trends partly due to the time restrictions of the survey. As will be analysed later, Kinoni Village has a higher percentage of households growing sugarcane under contract with SCOUL. It does not appear to have unsuitable ecological conditions for growing *nakati n*or poor market access for selling compared to other villages. The only conceivable reason at this point is that, as the case of vanilla cultivation in Nkaaga Village demonstrates, a social network of some kind must be in place for a certain type of cash crop to be accepted by residents and become a popular crop in the village.

[45] See the following case study on Zambia for importance of cassava in rural Africa.
Murao, Rumiko (2006) "Kuki wo ueru Hitobito (The people who plant cassava stem on sand)," Africa Report, No.43. pp.19-23, Institute of Developing Economies.

Table 2－2　Crops Grown in the Three Surveyed Villages (households)

Crops ＼ Village	Nkaaga		Buvunya		Kinoni		Total
(sample households/total households)	(74／120)	%	(64／265)	%	(57／210)	%	
Cassava	49	66.2	39	60.9	45	78.9	133
Matooke (cooking bananas)	57	77.0	19	29.7	17	29.8	93
Beans	31	41.9	28	43.8	28	49.1	87
Maize	28	37.8	24	37.5	35	61.4	87
Coffee	40	54.1	22	34.4	25	43.9	87
Sweet potato	29	39.2	25	39.1	25	43.9	79
Potato	9	12.2	16	25.0	10	17.5	35
Sugarcane (for sugar)	3	4.1	1	1.6	27	47.4	31
Nakati	8	10.8	10	15.6	0	0.0	18
Vanilla	13	17.6	1	1.6	1	1.8	15
Yam	7	9.5	2	3.1	4	7.0	13
Medicinal plant	7	9.5	1	1.6	0	0.0	8
Sugarcane (raw)	6	8.1	0	0.0	1	1.8	7
Tomato	2	2.7	1	1.6	1	1.8	4
Ground nuts	4	5.4	0	0.0	0	0.0	4
Finger millet	1	1.4	1	1.6	0	0.0	2
Rice	0	0.0	0	0.0	2	3.5	2
Peas	1	1.4	0	0.0	0	0.0	1
Cacao	1	1.4	0	0.0	0	0.0	1
Fruit	7	9.5	2	3.1	0	0.0	9

Source：Field Survey.

Photo 2-1 Conventional “three-stone” stove

Photo 2-2 “Improved Stove” offered by NIDA, a local NGO

Photo 2-3 A banner advertising microfinance to the people in Lugazi. One of many microfinance projects existing in Mukono District.

2-2. Selection of Villages to be Included in the Survey and Method of Survey

2-2-1. Selection of Villages to be Included in the Survey

Two points were used as the criteria in selecting three villages to be included in the survey for the aim of identifying the realities of population increase and economic situation of households in rural areas as well as utilization of forest resources. The first requirement was existence of socioeconomic and geographic differences, such as market access, among villages to be surveyed. The second requirement was the selection of villages that are actively engaged in forest resource management with villages that are not. The interview with the sub-county office regarding the existence of a community-based organization (CBO) that popularizes and promotes community-based forest management (CBFM) assisted with the decison.

With these criteria greater detail on the local conditions and needs of each village could be effectively analysed. The three villages belong to the same sub-county of Najembe but are not adjacent to each other.

2-2-2. Implementation of the Survey and Its Method

Ten survey assistants, mainly consisting of men and women in their twenties with undergraduate degrees, accompanied the field survey team from the capital city of Kampala. All survey assistants were fluent in both English and Luganda (language of Buganda region). As Luganda was used for explaining the English questionnaire sheet and obtaining response to questions, they worked as interpreters for the Japanese survey team member at each household of surveyed villages. A local coordinator from Kampala, members of local councils (LC) of surveyed villages and staff from community based organizations of the surveyed region also accompanied the survey.

At each village, the survey team began the survey by meeting the local council chairperson and council members, and interviewing them about the overall situation of the village. On the first day of the rural survey in the afternoon of October 12, the survey team was divided into three groups of similar gender composition and accompanied each of the three Japanese survey team members who supervised the questionnaire survey. From October 13 onward, a gradual shift to individual surveying began as the Ugandan assistants became familiarized with the survey method and the Japanese team members shifted their job to supervising these relatively inexperienced survey assistants and checking the answered questionnaire sheets.

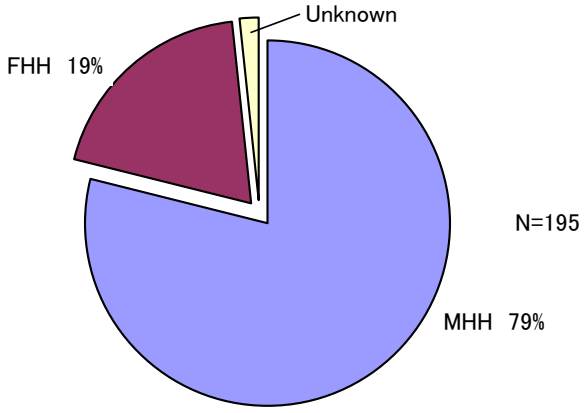
Owing to limitations in the number of survey staff and number of days available for the survey, we conducted the survey by selecting a total of 195 households from three villages.

Geographic placement of houses in rural East Africa consists of relatively dense housing plots along unpaved roads that are used for the passage of automobiles to other sparsely populated areas away from these roads. Households located at some distance from the road were also included in the survey in addition to those located along the road because commercial crop brokers and village shop (kiosk) as well as local council offices and community organization offices are concentrated along these

roadsides. A certain number of female household heads (FHH) were also included because they are recently receiving attention as a high vulnerability group in rural areas in the context of development studies (Figure 2-2).

The definition of "household" in the context of the household livelihood survey must be defined in terms of culture specific structures for an effective survey. According to the interviews, the Luganda word "*luiuliro*" means dining space in the house where family members take a meal together, and people often use this word to represent the people who share their livelihood, such as "those that share the *luiuliro*". This meaning "those that share the *lujuliro*" was used, as the de facto unit of livelihood, as the "household" in grasping the realities of livelihood. For instance, relatives that are outside the range of nuclear family bound by a biological parent-child relationship should be included among household members if they have been eating there for an extended period of time. Family members that are working in cities and are regularly sending money as well as students attending secondary boarding schools in cities and have their tuition paid by their families were all regarded as members that constitute the household. Christianity was predominant in all surveyed villages and accounted for more than 60% of the population. There were few polygamous households and all ethnic groups that are predominant in ethnic composition were paternal societies with wives living in husbands' homes (Table 2-3). However, we also observed many cases of predominantly female household heads (FHH) that had returned to the home of their birth with their children following divorce.

Figure 2－2 Female Household Head (FHH) Ratio



Source: Field Survey

Table 2－3 Compostion of Ethnic Household Head

Ethnicity／Name of Village	Nkaaga Village	Buvuunya Village	Kinoni Village	Total
Baganda	50	28	34	112
Basoga	8	10	13	31
Bagisu	4	3	3	10
Banyarwanda/Bafumbira (immigrants from Rwanda)	4	5	0	9
Basamia	1	2	2	5
Banyankore	3	2	0	5
Iteso	2	1	1	4
Bagwere	0	2	1	3
Langi	0	3	0	3
Banyoro	0	2	1	3
Immigrants from Burundi	1	1	0	2
Badama (Jopadhla)	1	1	0	2
Langi	0	1	0	1
BaKiga	0	1	0	1
Batooro	0	1	0	1
Lugbara	0	1	0	1
Bavuma	0	0	1	1
Immigrants from DRC	0	0	1	1
Total	74	64	57	195

Source：Field Survey.

2-3. Overview of Surveyed Villages

Distinctive aspects including actual number of households and number of sample households in each village, their geographic location (particularly their access to arterial roads and markets) and their approach towards forest utilization management will be described for each of the three villages included in the survey (Also see Table 2-4).

Table 2－4 Outline of Survey Villages

	No. of Households	Sample	Distance from arterial road	Remarks
Nkaaga	120	74	3km (bad condition through forest)	Forest is managed for sustainable use by LC1
Buvunya	265	64	1.5km	CBO for sustainable use of forest exists
Kinoni	210	57	3km	Afforestation is done by each individual

Source：Field Survey.

2-3-1. Nkaaga Village: A village located in the forest reserve

Nkaaga is a village consisting of 120 households with Baganda and Basoga accounting for the major ethnic groups. A questionnaire survey was conducted on 74 sample households in this village and its surroundings (i.e. Bakata Village and Buwola Village).

The village is situated like an enclave in a section of Mabira Forest Reserve. For this reason, the unpaved motorway that runs through the forest and connects the village with the asphalt-paved Jinja Road is not by any means in good condition compared to the other two villages and becomes difficult to use in rainy weather. The common means of transporting harvested crops such as matooke and *nakati* to the market include foot, bicycle and a scooter called *boda-boda*. Those who do not own any means of mechanical transportation pay drivers to ship their crops. Distance to both the permanent Najembe Market and the periodic Lugalambo Market located relatively nearby is approximately 7 to 8 kilometres. Due to poor road conditions, however, it takes two hours by bicycle and 20 to 30 minutes by *boda-boda* to get to the market.

The aforementioned NIDA staff accompanied the survey team from the sub-county

office to the village on the first day of the field survey. Many acquaintances of NIDA staff were living along the unpaved road in the village and appeared to be interacting and exchanging information with NIDA staff on a regular basis. Once travelling on a narrow side road, however, the number of NIDA staff acquaintances decreased and the number of households receiving few administrative services increased.

The local council of Nkaaga Village has taken the initiative to implement several livelihood-related dissemination activities and operations with neighbouring villages. Village residents assemble every Wednesday to engage in one activity or another. Content of activities include group study and sharing of information related to crop production enhancement (including visits to respective households), planning and implementation of unpaved road construction in the village and dissemination of knowledge about public health at schools. A penalty of 1,000 U.Sh. (Ugandan shilling, = 67 yen) is imposed to those that miss the meeting and is used to cover the meeting expenses. Missing two consecutive meetings is said to be subject to sub-county deliberation although its effectiveness was not confirmed.

The village council manages the forest in accordance with the National Forest and Tree Planting Act when utilizing forest resources. For instance, fallen trees and branches can be collected for firewood but a permit from sub-county and the NFA (National Forestry Authority) is needed to cut a live tree. Violators are imprisoned at the rate of about three a month, mostly from outside the village.

2-3-2. Buvuunya Village: A village where a CBO is active

Buvuunya Village is made up of 265 households with Baganda and Basoga comprising the major ethnic groups. In recent years several households have come to the village to work as agricultural workers at the sugarcane plantation owned by SCOUL. A questionnaire survey was conducted on 64 sample households.

Among the three villages, Buvuunya Village is located closest to the Jinja Road (1.5 kilometres) and the unpaved road from the arterial road to the village is in good condition. Lugalambo Market is closer to the village and when selling crops can be accessed in 30 minutes by bicycle and 10 minutes by *boda-boda.* Fare is 1,000 U.Sh for a driver. Meanwhile, it is one hour by bicycle and 30 minutes by *boda-boda* (3,000 U.Sh. = 201 yen) to the permanent market in Najembe. At any rate, the village has good access to local markets because of the good road conditions.

There is a community organization named Conserve for Future Sustainable Development Association (COFSDA) with its base in the centre of the village working towards dissemination and promotion of community-managed forest resources. Such an activity is a feature that was not seen in the other two villages (Photo2-4). A simple history of COFSDA and information about its current activities were provided by the staff member Mr. Tabula.[46] According to this information, a group that later grew into COFSDA was formed in 2000 by six male and four female village residents in order to cope with the misuse of forest resources that was becoming conspicuous. It was not until after January 2006 when it signed a collaboration agreement that would

[46] Mr. Tabula is also the representative of Uganda Network for Collaborative Forest Association (UNETCOFA) which is a network of various organizations that are engaged in participatory forest management in the country. His presence may have been the key in establishing the CBO in this village.

remain effective for 10 years that it became possible for COFSDA to carry out activities with more effect. At the backdrop of the conclusion of this agreement was the enactment of the National Forest and Tree Planting Act in 2003 that enabled communities located adjacent to national forests to obtain government assistance and the implementation of a survey at the request of the Minister of Water, Lands and Environment in 2005.[47]

The village is approaching sustainable development of the forestry through partnership with COFSDA, local council (LC1) and individual residents. Work is basically performed on a volunteer basis. In addition to meetings that are held once every three months, the group visits all households in the village for a period of one week every year as a part of an intensive information dissemination activity. They are also actively collecting relevant information by building partnerships with local and global NGOs. Participation in these activities are voluntary and with no coercion or penalty against non-participation. A decision has also been made to allow residents to enter the forest and collect resources four days a week, i.e. Tuesdays, Wednesdays, Saturdays and Sundays, and prohibits them from doing so on other days (Photo 2-5). Violations are strictly penalized. Firewood that can be collected is also limited to fallen trees and several tree varieties that have been designated for such purpose. A unique penalty of purchasing 100 seedlings designated by COFSDA is imposed on violators and paired with tree planting activities (Photo 2-6). Cutting of trees other than the designated varieties can only be performed by COFSDA as a rule but can also be performed by other entities by applying to COFSDA. In such an event, a permit is issued after the content of the application is reviewed at Mukono Mabira Forest Reserve Branch of the National Forest Authority (NFA) (see Section 1-3-4). NFA and COFSDA issues the cutting permit by designating grown trees in areas that are least at risk from the viewpoint of sustainability. Applicants allegedly are obligated to plant trees prior to cutting (e.g. plant 10 seedlings before cutting two trees). NFA and COFSDA also check the forest after the cutting to determine whether the cutting was performed properly.

People's involvement in forest resources has changed from a wasteful practice of cutting live trees one after another to a sustainable and sound practice of selectively using dead trees and fallen trees as a result of these community organization activities. Prior to 2003, the central government provided strict penalties to which NFA officials simply chased the residents out of the forest. Meanwhile, the residents felled trees indiscriminately despite the risk of being detained for collecting even a dead tree. According to the staff that we interviewed, restrained and sustainable use of the forest was realized by allowing the people themselves to decide the rules for forest use based on their needs. COSFDA's membership has reached 60 since January 2006 when the agreement was signed with the government.

Of special note with regard to Buvuunya Village, aside from this noticeable community based organization activity, is the existence of a flourishing brickmaking industry. There were several households in the village that relied on brickmaking for their source of cash income (Photo 2-7). The bricks are mainly shipped to merchants in Jinja by truck. Six thousand bricks are shipped in a single shipment.

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[47] COFSDA also works in cooperation with ACODE (Advocates Coalition for Development and Environment) which is a think tank located in Kampala involved in research, assessment and proposals on development and environmental issues.

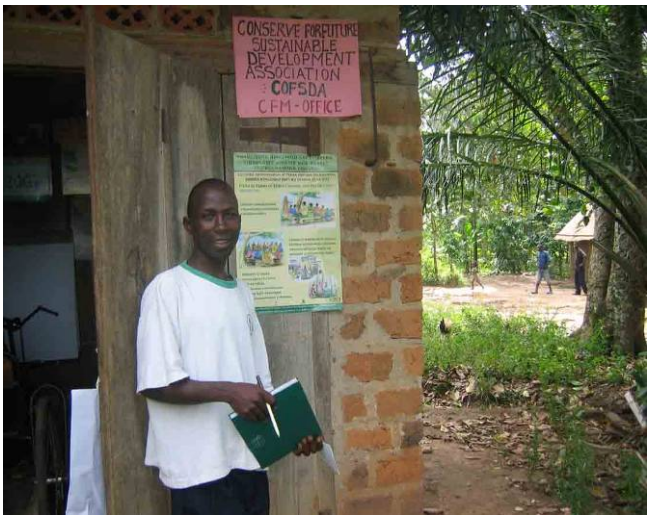


Photo 2-4 Office of COFSDA, a community based organization based in Buvuunya Village developing activities related to sustainable utilization and management of forest resources.

Photo 2-5 October 14, 2008 A group of girls and young ladies headed from the Buvuunya village centre to the forest to collect firewood around 4pm.

Photo 2-6 Boundary between forest reserve and farmland in Buvuunya Village. Trees are being planted around the boundary.

Photo 2-7 Production of bricks in Buvuunya Village. People come in trucks from Kampala and Jinja to purchase these fired bricks. Six thousand bricks are sold in single shipment.

2-3-3. Kinoni Village: A village with a large number of sugarcane growing households

Kinoni Village consists of 210 households with Baganda and Basoga ranking among the most common of the ethnic groups. A questionnaire survey was conducted for 57 households from this village and its surroundings (Bamungaya Village). According to an interview conducted with the members of the village council, the origin of this village dates back to the transition period from the 19th Century to the 20th Century when workers engaged in railroad construction settled in this area. There are a large number of households that are growing sugarcane under contract with SCOUL. A certain number of households are also engaged in brickmaking but to a lesser degree compared to Buvuunya Village.

Kinoni Village is located approximately 3 kilometres from Jinja Road and the condition of the unpaved road is between that of Nkaaga Village and Buvuunya Village. Najembe Market is about 5 kilometres away and takes more than 30 minutes by bicycle and 15 to 20 minutes by *boda-boda*. The fare for shipping on *boda-boda* ranges from 2,000 to 3,000 U.Sh. (= 134-201 yen). Lugalambo Market, located about nine kilometres away, is used less frequently compared to the other two villages. Merchants come from Kampala, Jinja, Mukono and Lugazi to buy crop production. In addition to meeting the demand from these markets, bricks are also supplied to local areas such as Najembe and Mubikko. Many of the residents seemed to believe that sugarcane is the most efficient cash crop.

According to the village council chairman, residents individually receive seedlings from NFA's Mabira Forest Reserve Branch Office located in the district capital city of Mukono and are participating in tree planting activities without compensation. It is an activity that became popular among people through a radio appeal by NFA Mabira Office and through second hand information from people that heard the appeal, and its range of activity is gradually expanding. Residents are only allowed to enter the forest and utilize the resources on Sundays. Even on the designated day, use is limited to fallen branches and trees. The village reports violators to NFA and they are put on trial.

The profile of the three villages included in the survey and an overview of their approach towards forest resource management are as described above. Contrary to our assumption, we observed no clear difference in the existence of approach between villages that had community-based organizations (CBOs) for sustainable utilization and management of forests and villages that did not have such organizations. Nkaaga Village did not have a CBO but its village council managed the forest according to the basic principles of NFA and the residents of Kinoni Village were participating in tree planting activities through public announcements such as on radio. However, these two villages were rather unclear about the extent to which people should participate in making decisions about important matters thorough direct coordination between village council and NFA while Buvuunya Village demonstrated greater orientation of residents toward improving their awareness and being involved in decision making. In this sense, Buvuunya Village has materialized the principle of community-based forest management (CBFM) compared to the other villages at this point in time.

On the other hand, an attribute common to all villages is the fact that in local councils (LC), which represents Uganda's local authority, councils that are positioned at the upper level of the village and the lower level of the district government, i.e. county (LC 4) ,Sub-County (LC3) and parish (LC2) level, are playing a less active role in these rural community efforts for sustainable utilization of forest resources.

A council member of Najembe Sub-County that the survey team visited stated that, although a regional approach has been launched with much enthusiasm, he is of the impression that the new program is implemented through direct involvement of the rural government and NAF which controls the forest reserves, leaving the role of sub-county government ambiguous. Identifying the active role to be played by the council positioned at the middle level of local government can be seen as one of the challenges.

In addition to the need for such improvement of the system, the need to build a system of management through repeated trial-and-error is at the core of CBFM's principle. Following a statistical overview of living standards of surveyed villages, details of household livelihoods in these villages will be analyzed in concrete terms below based on data obtained through interviews conducted using a questionnaire.

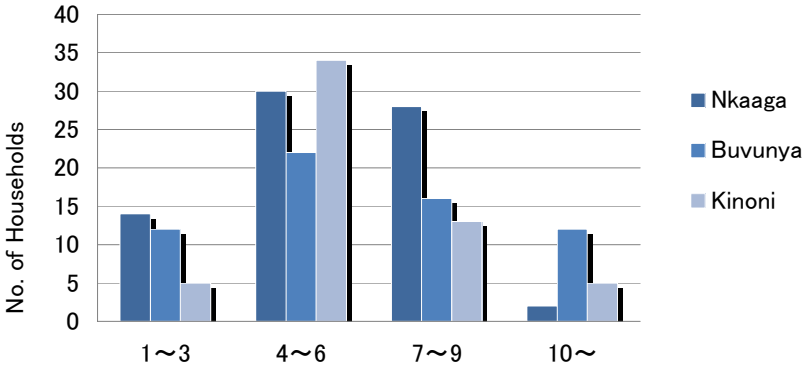
2-4. Reality of Livelihood and Forest Use in Surveyed Households

2-4-1. Characteristics of households

The number of family members living in each household at the time of survey is shown in Figure2-3 and Table 2-5. The frequency of households having 4 to 6 members is the highest in all surveyed villages. However, average number of family members rises to 6-7 because of some large families consisting of more than 10 members. The number of household heads in their thirties is largest however, the average age of the household head is between 42 and 45 years old, which is still a relatively young age group (Table 2-6).

In terms of the year these families started to live in their present location, a large number of Nkaaga Village residents have been living there for a long time (mostly since the 50s) while Kinoni Village largely consists of people who settled there after the year 2000 (Figure 2-4). This reflects the increase in sugarcane farmers in Kinoni Village in the recent years as well as the existence of workers hired by sugarcane companies and farms.

Figure 2-3 Number of Family Members Living in Household



Source: Field Survey

Table 2-5 Number of Family Members Living in Households

No. of Household Members*	Nkaaga	Buvunya	Kinoni	Total
1～3	14	12	5	31
4～6	30	22	34	86
7～9	28	16	13	57
10～	2	12	5	19
Average	5.7	7.5	7.0	6.7

(households)

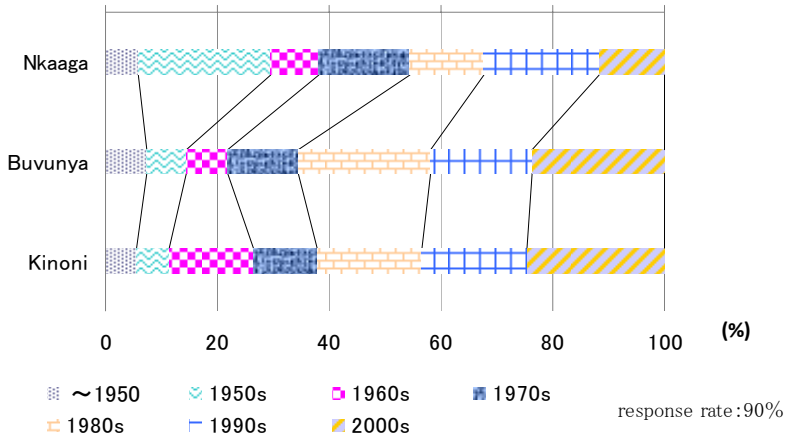
*Number of households means family members are living together .
Source：Field Survey.

Table 2-6 Age of Household Head

	Nkaaga	Buvunya	Kinoni
～19	1	0	0
20～29	6	7	8
30～39	24	17	19
40～49	16	14	13
50～59	10	15	5
60～69	9	3	4
70～	5	5	3
Average age	45.5	45.5	42.3

Response rate: 94% (households)
Source: Field Survey.

Figure 2-4 Village Relocation Year



Source: Field Survey

2-4-2. Scale of Farm Ownership and Management

The area of owned and managed farms is predominantly less than three acres which is small compared to the estimated average owned farm size in Uganda of five acres, but is considered nearly average compared to that of the three acre average in Mukono District[48] (Table 2-7).

However, Buvuunya Village had the smallest farms among the villages surveyed, suggesting that segmentation of land may have advanced to a greater degree here than in other villages.

Borrowing and leasing of farmland was observed in each village. The majority of those households who leased were cultivating with a high dependence on the leased farm for both home consumption and cash income purposes sometimes without possessing their own farm (Table 2-8). A review of the percentage of leased farms to total managed farms of these households revealed households having percentage over 100%, i.e. cases where the tenants are not planting on all of their leased farm and even leaving part of it fallow. Cultivated areas of tenant households ranges from 1.5 to 3 acres (not shown in table). Amount of rent, method of its payment and term of contract varied depending on the relationship between landlord and tenant. The highest amount of rent paid was approximately 50,000 U.Sh. (= 3,360 yen) per acre when paid in cash and fluctuated between 5 to 25% of harvest when paid in goods. Cases that did not charge rent were observed particularly among those related by blood with the contract period often extending over several years.

[48] Mukono District Local Government (2006), "Mukono District Council Statistical Abstract 2006".

Table 2-7 Area of Farm Ownership and Farm Acreage

	Nkaaga		Buvunya		Kinoni	
	own	cultivate	own	cultivate	own	cultivate
～1ac	10	7	26	21	13	8
1～3ac	32	39	24	34	19	28
4～6ac	12	15	6	5	15	14
7～9ac	3	8	2	2	6	4
10～19ac	10	4	4	0	2	1
20ac～	6	0	0	0	1	1

Response rate：98% (households)

Source：Field survey.

Table 2-8 Ratio of Rented Land by Cultivated Land (average)

	Nkaaga	Buvunya	Kinoni
Tenant households	8	12	13
Ratio of Leased Land (%)	114.58	81.82	73.53

Source：Field Survey

2-4-3. Asset Holding

Ownership of expensive farm equipment and durable consumer goods excluding hoe, harrow, sickle, etc. for manual labour is shown in Table 2-9. Agriculture using ox-plough is not practiced and cattle-drawn carts are not used for transportation either in this area. To carry farm products to nearby markets bicycles are mainly used. Bicycle is the second most common durable consumer good after radio in all villages surveyed and constitutes an important asset.

While livestock keeping can be interpreted as a form of asset holding in rural Africa, dependence on a livestock industry was low in the survey area with a very limited number of animals being raised (Table 2-10).

Table 2-9 Ownership of Expensive Farm Equipment & Durable Consumer Goods

	Nkaaga		Buvunya		Kinoni		
	number	rate	number	rate	number	rate	Appraisal Value
Plough for ox	0	*0.00*	0	*0.00*	0	*0.00*	(unknown)
Cart for bull	0	*0.00*	0	*0.00*	0	*0.00*	60,000
Wheelbarrow	7	*9.46*	4	*6.25*	5	*9.09*	55,000
Pump	10	*13.51*	4	*6.25*	2	*3.64*	150,000
Beehive	6	*8.11*	2	*3.13*	0	*0.00*	10,000
Tractor	0	*0.00*	0	*0.00*	3	*5.45*	(unknown)
TV	13	*17.57*	3	*4.69*	3	*5.45*	100,000
Radio	64	*86.49*	43	*67.19*	43	*78.18*	50,000
Bicycle	39	*52.70*	25	*39.06*	31	*56.36*	100,000
Motor-bike	4	*5.41*	6	*9.38*	2	*3.64*	800,000
Car	1	*1.35*	1	*1.56*	0	*0.00*	(unknown)

Response rate：99% (household) (%) (U.Sh.)

※ possession rate is based only on respondents

※ appraisal value is based on Nkaaga villiage leader's estimation of average price

※ the possession rate of tractors in Kinoni village might inculde leased ones from sugarcane company

Source: Field Survey

Table 2-10 Livestock Ownership

	Nkaaga		Buvunya		Kinoni	
	households	average number of	households	average number of	households	average number of
Bull	21	3.0	19	3.2	24	2.4
Goat	41	3.0	26	2.3	32	3.1
Ram	10	2.7	2	2.0	0	0.0
Pig	7	2.7	10	2.2	21	2.0
Chicken	53	8.1	43	4.8	46	7.4

Response rate : 99%

(household) (number of livestock)

Source : Field Survey

2-4-4. Cultivated Crops and Commercial Crops

Mukono District where the surveyed villages are located is known for a cropping system characterized by inter-cropping that typically mixes matooke (bananas) and coffee with maize and legumes. Around three crops were usually being mixed in a single plot at surveyed villages (Table 2-11). The total planted area and yield of each main crop at surveyed households are shown in Table 2-12. It is very difficult to accurately grasp the realty of such inter-cropping since the crops are mixed with different densities and especially crops for home consumption are often harvested directly from the field in small quantities. For this reason, the figures shown in this table are approximate estimations. Calculated yield in the surveyed area is slightly lower than the district average between 2000 and 2003 found in similar survey results reported by Mukono District.

A comparison of planted crops (Table 2-2) and crops for sale (Table 2-13) reveals that staple crops such as matooke, cassava and maize are also sold as commercial crops. In particular, matooke and cassava can be harvested throughout the year and are directly harvested for home consumption or harvested and sold in the market when cash requirement arises. These crops are sold at nearby markets or to buyers mainly from the village and consumed within the country.

Marketing information for the main crops is shown in Table 2-14. All crops have channels to traders in and outside the village. It is inferred that "traders outside the village" includes many cases where farmers carry their crops on bicycle to the side of an arterial road or markets outside their village to sell to traders in addition to selling to traders who come to the village. Some farmers also sell their crops to restaurants located behind the bigger market out of the village surveyed. What makes this practice unique is the fact that matooke and cassava, which are harvested throughout the year, tend to be sold to "traders outside the village," which coincides with the reference above to farmers delivering and selling their crops for their convenience not just waiting for traders to come. Coffee is sold to traders in and outside the village at almost the same percentage, partly because the owners of retail shops also run a brokerage business. Crops that are harvested entirely such as maize and kidney beans are also traded without distinction of traders' location since trading becomes active in the harvest season.[49]

[49] It is generally true for all of Africa but crop storage skills of farmers is poor and facilities are mostly not available. Storage loss is one of the challenges faced by crop farming households. Mukono District Local Government, *ibid.*

Coffee and sugarcane for refined sugar are typical cash crops. Coffee bean production was abandoned once in response to a fall in international prices but has been increasing with the recovery of prices in recent years. However, sugarcane is currently being planted (particularly in Kinoni Village) because of the stable demand made possible through contract farming and is bringing in large gross income. In the interview, almost all farmers that started growing sugarcane stated "generating higher income and earning cash" as their purpose to suggest that they have selected the crop in anticipation of its profitability (Table 2-15). However, sugarcane has high production costs. Sugarcane growers under contract receive seedlings and fertilizer if needed from the sugarcane company on credit which, in addition to the transportation cost of sugarcane from the field to the sugar company, are deducted from their earnings. Farmers are also bound by contract with regard to who they sell their crops to and period of cropping and harvesting with little opportunities for price negotiation.

> *The reality of sugarcane cultivation was heard from a Buvuunya Village farmer growing sugarcane under contract from SCOUL since 2000. The farm where he currently grows sugarcane had been used for growing maize in the past but was switched to bananas because maize did not bring much income. Bananas were also experiencing difficulties in terms of profitability when an agricultural extension worker came to his farm and recommended growing sugarcane. SCOUL initially said that he can grow 40 to 50 tons per acre but his actual production was 20 to 30 tons, which he attributes to his reduction of fertilizer input to save costs. Eighteen months are needed from the planting of seed canes to first harvest. It is agreed by contract to harvest five times and to sell these productions entirely to SCOUL. He is not permitted to sell his products to other buyers in the meantime. Therefore he cannot change his buyer until the contract has expired even if he finds a new sugar company that would buy his sugarcane at a higher price. Only larger farms are qualified to negotiate prices. At 20 to 30 tons of production, he belongs to the small farm category. The buying price at the time of the survey was 26,000 U.Sh. (= 1,742 yen) per ton[50].Some ten tons of sugarcane are collected by truck as a single shipment for which he is charged 100,000 U.Sh. (= 6,700 yen). This rate applies when the farm is located less than 22 kilometres from the sugar company and an additional 40,000 U.Sh. (= 2,680 yen) is charged per truck when the farm is located farther than 22 kilometres but not more than 40 kilometres. Fortunately, his farm is within the 22 kilometre range and the sales after having the transportation cost deducted would come to at least 160,000 U.Sh. (= 10,720 yen). Cost of inputs purchased from SCOUL and rented equipment during the period are also deducted from this amount. While he himself thinks that he is still enjoying the profitability of sugarcane cultivation, he has also said that he would need more than five acres of land to secure sure profitability. As it is difficult to secure that much land in this region, some farmers have given up on sugarcane cultivation.*

Produced in this manner, sugarcane fields are completely burned every five years to recover soil fertility. Then fertility is recovered to the extent that crops can be grown again after about a year[51].

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[50] Buying price is determined by weight and not affected by quality of sugarcane.

[51] This is the same when restarting sugarcane production but cases are also observed in which fertilizer recommended by SCOUL is applied and new contract is signed without waiting for the one year fallow period (according to local coordinator).

As told by this farmer, profitability cannot be maintained without securing a certain area of land considering the cost of transportation and equipment rental has a high base cost. However, once that is realized it can become a major source of cash revenue. To put it the other way round, promotion and expansion of sugarcane cultivation has the potential of turning a wide range of land into sugarcane monocropping fields.

Table 2－11 Mixed Cultivated Crops（in one plot）

	Nkaaga	Buvunya	Kinoni
Average no. of crops	3.4	2.7	2.8
Mode of no. of crops	3	3	3

Source：Field Survey

Table 2-12 Cultivated Area Size and Production

	Nkaaga	Buvunya	Kinoni
Matooke	63.24	7.76	8.15
>Kg	*901.11*	*902.61*	*923.29*
>bunch	*87.37*	*87.99*	*57.86*
Coffee	42.05	14.18	10.81
	305.63	*269.39*	*372.38*
Cassava	21.88	15.68	24.32
	1040.29	*825.00*	*911.30*
Maize	31.53	10.36	19.65
	541.85	*640.65*	*408.57*
Beans	15.77	7.18	5.58
	364.46	*226.32*	*402.04*
Sweetpotato	9.13	10.96	5.84
	767.73	*470.10*	*518.02*
Potato	3.75	7.01	3.50
	857.07	*778.42*	*708.57*
Vanilla	9.32	0.50	0.05
	211.97	*200.00*	*40.00*
Sugarcane	15.00	7.00	47.09
(for sugar)	*33684.21*	*(still unharvested)*	*28100.00*

※ cultivated area size(ac); *production/ac(kg)*
matooke is calculated by bunch
<note>
※ coffee is measured as raw beans and dehydrated
※ vanilla production in Buvunya and Kinoni is only one household
Source：Field Survey

Table 2-13 Crop Sales

crops	Nkaaga		Buvunya		Kinoni		Total
	number of households	sales／household	number of households	sales／household	number of households	sales／household	number of households
Coffee	30	556,959	14	280,557	14	136,000	58
Matooke	28	232,405	5	68,750	3	516,667	36
Cassava	12	119,494	11	91,469	13	101,417	36
Maize	14	177,942	9	119,750	7	52,143	30
Beans	14	137,114	7	56,167	8	88,250	29
Sweetpotato	6	90,167	6	184,000	5	33,375	17
Sugarcane for sugar	2	1,590,000	0	n.a	15	1,647,917	17
Nakati	11	205,182	1	72,000	0	n.a	12
Vanilla	8	304,014	2	105,000	1	2,000	11
Potato	1	140,000	5	152,000	2	77,500	8
Medicinal plants	9	1,423,833	2	18,600	0	n.a	11
Fruit	2	n.a	2	n.a	0	n.a	4
Tomato	2	232,000	0	n.a	1	640,000	3
Sugarcane (raw)	1	105,000	0	n.a	1	300,000	2
Yam	1	n.a	0	n.a	0	n.a	1
Cabbage	1	6,000	0	n.a	0	n.a	1
Cacao	1	600,000	0	n.a	0	n.a	1
Others	0	n.a	2	n.a	3	25,500	5
No sales	17	0	32	0	16	0	65

(household) (U.Sh.)

※ average sales of crops in October 2006 September 2007

Source：Field Survey

Table 2-14 Main Crop Sales

	Lufula market	Najembe market	Village Broker	Other Broker	Villager
Coffee	1	1	23	26	5
Nkaaga	0	0	13	12	3
Buvunya	1	1	5	7	1
Kinoni	0	0	5	7	1
Matooke	0	1	9	20	5
Nkaaga	0	1	3	19	5
Buvunya	0	0	3	1	0
Kinoni	0	0	3	0	0
Cassava	1	1	5	19	7
Nkaaga	1	1	0	5	4
Buvunya	0	0	1	9	1
Kinoni	0	0	4	5	2
Maize	0	0	11	14	3
Nkaaga	0	0	3	9	1
Buvunya	0	0	7	1	1
Kinoni	0	0	1	4	1
Beans	0	1	11	12	4
Nkaaga	0	0	6	4	2
Buvunya	0	0	1	5	1
Kinoni	0	1	4	3	1
Total	2	4	59	91	24

※ Kinoni village also included sales to schools (included as Villager) (household)

※only 1 respondent sells to more than one party

Source: Field Survey

Table 2-15 Reasons why sugarcane cultivation was started（multiple answers）

Reason	Number
Increase income/for cash	19
Grows quickly	4
Other cash crops sale price is decreasing	4
For investment	3
Market exists：sugarcane campany would purchase	3
Not likely to be destroyed by disease, insect or animal	3
Sugarcane company support is available	2
Soil is suitable	2
Easy to cultivate	1
Neighbor is cultivating	1
Efficient use of land	1

※ 7 respondents in "increase income/for cash" mentioned that cash was needed for educational costs
Source：Field Survey

2-4-5. Livestock Industry

As shown in Table 2-10, livestock husbandry is not popular. A small amount of milk is sold but its contribution to farm income is trivial. However, profit from sales of cattle is large. Bulls are traded at 200,000 to 400,000 U.Sh. (= 13,400 to 26,800 yen) and would therefore bring in substantial income from a single sale. According to households that sold their cattle during the period covered by the survey (October 2006 to September 2007), cattle were sold to pay for school and medical expenses. Although small in scale, it is thus playing the role of a livestock asset in which cattle are being raised to cover emergency expenses rather than to maintain daily livelihood (Table 2-16).

Table 2-16 Livestock Sales and Reason

	Nkaaga	Buvunya	Kinoni
Households with livestock	17	6	10
Average price（U.Sh.）	109,618	1,172,500	138,600
Household sales over 100 thousands U.Sh.	5 households	4 households	3 households
Reason for Sale （multiple answers）			
>education	13	1	9
>business investment	4	1	1
>medical costs	3	0	3
>clothes	0	3	0
>others	1	2	0

※ others: "having livestock is hard","livestock was sick","for Christmas celebration"
Source： Field Survey

2-4-6. Source of Cash Income Other Than Sale of Agricultural and Livestock Products

(1) Economic activities other than the sale of agricultural and livestock products
Wage labour and employment opportunities outside of selling agricultural products in surveyed villages varied widely (Table 2-17). Many of the jobs are attributable to the

advantageous location of being in the suburbs of Najembe and Lugazi. Households engaged in industries that use forest resources such as brickmaking, lumber/firewood/charcoal processing and sales are believed to be large in number for the same reason. Production and sale of bricks are particularly common in Buvuunya Village. As will be discussed later, it can be seen as one of the results of activation of economic activities using forest resources that came about through clarification of forest conservation rules in the village.

(2) Debts loan

Like many other rural areas of Africa, it is not easy to borrow money in the surveyed villages with only a few households having access to loans offered by NGOs, sugar companies, etc. (Table 2-18). The most common purpose of taking a loan was for education in this case as well. What this tells us is the existence of lenders who can offer loans for purposes that are not necessarily business investments. However, it is also true that many households principally engaged in agriculture are facing credit constraints. Many farmers that responded "Could not borrow money" or "Do not want to borrow money" gave concern over debt default such as "Afraid of borrowing money" and "Cannot borrow when the money cannot be repaid" as their reason.

At the same time, it is difficult for rural people to save and store large amounts of cash safely. The percentage of households with bank accounts was between 10 to 20% even in survey areas of the suburbs (Table 2-19). Households that cannot afford to have accounts[52] will have difficulty in managing any loan they would be able to take.

(3) Remittance

Some households that have blood relatives in cities receive remittance income from them. Approximately 20% of households in the survey villages were receiving remittance in the form of cash or in kind. Meanwhile, a similar percentage of households was sending remittance outside of their villages.

[52] Minimum deposit of certain amount (initial deposit) is required to open and maintain a bank account. Furthermore, banks do not always attract farmers due to the distance and transportation costs to town where the bank is located.

Table 2-17 Non-agricultural Income Source

	Nkaaga	Buvunya	Kinoni	Total
Paid-worker（agriculture)	6	8	7	21
Brick production/sales	0	10	4	14
Retail trading	4	5	2	11
Boda-boda taxi driver	3	5	1	9
Broker（agricultural）	6	0	2	8
Forest resources/processed goods sales	3	1	3	7
Teacher	2	0	4	6
Local beer sales/bar management	1	2	3	6
Broker（general）	1	3	1	5
Restaurant management/staff/cook/sales	0	5	0	5
NFA Forest Guard	5	0	0	5
Landlord	3	0	0	3
Pastoralist	3	0	0	3
Machine operator/repairman/technical expert	0	2	1	3
Milk sales/milk production company employee	2	1	0	3
Construction worker	1	0	1	2
Paid-worker（sugarcane company）	0	0	2	2
House Work	0	0	1	1
Public employee	0	0	2	1
Security officer	0	1	0	1
Blacksmith	0	0	1	1
Nurse	0	1	0	1
Machine operator（company）	0	1	0	1
Peddler（cloth）	0	0	1	1
Hair salon/beauty salon	0	1	0	1
Material rental	0	1	0	1
Photographer	0	1	0	1
Paid-woker（general）	1	0	0	1
Traditional healer	0	1	0	1
Broker（livestock）	0	1	0	1
Butcher	0	1	0	1
Dividends from agricultural cooperative	1	0	0	1
Textile worker	0	1	0	1
Clergyman	0	1	0	1
Instaling electric fence	1	0	0	1
Total	43	53	36	132
No. of households with non-agricultural income source	32	49	37	118
Ratio of all sample households（%）	43.24	76.56	64.91	60.51

（household）

※some households have multiple occupations

※forest resource/processed goods sales inculdes timber, firewood & charcoal production and sales

※broker (agricultural) is dealing with coffee & medicinal plants

※paid-worker in Kinoi includes 2 households working in sugarcane company

Source：Field Survey

Table 2-18 Borrowing from External Organizations

	Nkaaga	Buvunya	Kinoni
Borrowing households	16	7	8
Debt/household (U.Sh.)	550,000	530,000	667,000
Purpose (mutiple answers)			
education	6	5	6
business investment	8	2	1
agricultural investment	3	0	4
health/medical expenditure	0	2	1
construction or renovation of house	3	0	0
others	0	1	0

※ external organization: NGO, agricultural financial association, sugarcane company etc.
Source：Field Survey

Table 2-19 Households with Bank Accounts

	Nkaaga	Buvunya	Kinoni
Holding household rate (%)	24.66	10.94	15.79
Average bank saving (U.Sh.)	390,923	180,667	164,444
Average home saving (U.Sh.)	225,000	125,333	45,000

Source：Field Survey

2-4-7. Cash Income Status

Cash income status from the sources stated above is analysed below (loans are not included here). Gross income, not net income, is used as it was not possible to conduct a detailed survey on production costs and private business expenses.

Households[53] were first divided into six groups according to their cash income (Table 2-20).

Table 2-20 shows that there is a very wide disparity of nearly one hundredfold in income between the lowest earning Group 1 and the highest Group 6. According to Table 2-21 which presents the details of income for each group, disparity was significantly apparent in “Income from selling farm products” and “Income from wage labour/private business.” Major influence of disparity was income from sugarcane sales for the former and the amount of cash income from the same sector for the latter. When degree of dependence on respective sectors is studied from their component ratio (Figure 2-5), “Income from selling farm products” accounts for a large portion of income for low income groups while high income groups are supporting their livelihood through “Income from wage labour/private business.” Difference in absolute amount of income among these sectors is another cause of total income disparity. In other words, higher dependence of low income groups on small scale farm products sales in addition to increase in amount of income by sector from Group 1 to Group 6 in almost all sectors exists at the backdrop of large disparity. Additionally, coefficient of variation is calculated to identify the variation in cash income within each village and

[53] While number of family members is not indicated here, it can be considered that there is hardly any difference in family size among groups which range from four to six members.

it shows a high value for Kinoni Village (Table 2-20). The cause of this result is attributed to a larger number of sugarcane farmers than other villages and larger amount of their cash income than the other villagers in Kinoni village.

Contribution ratio of "Income from selling farm products" continues to decline up to Group 3 and then starts to increase up to Group 5. Detailed analysis of this cause will be omitted here, but it is presumed that intensive agriculture has been realized therefore the increase in production secures home consumption and provides surplus crops for sale and the contribution of sales of farm products to household income is increased.

It is also obvious that dependence on "Income from remittance" is higher among groups that have less cash income. As seen earlier, "Income from land rent" is very small with only three households receiving such income in the entire survey. All of these households have sources of cash income other than selling farm and livestock products and appear to be allocating family labours to such income earning opportunities and utilizing their farms by renting out to others.

Table 2-20 Cash Income Status

		Nkaaga		Buvunya		Kinoni	
	Total average (U.Sh.)	1,111,595		697,743		2,822,209	
	Coefficient of variation	1.76		0.96		3.13	
	Income class	household	average income	household	average income	household	average income
①	～100 000	10	50,777	4	29,092	10	48,130
②	100 000～300 000	16	174,056	13	174,077	10	173,380
③	300 000～500 000	9	379,000	9	398,644	6	385,833
④	500 000～1million	11	711,705	14	625,550	7	699,429
⑤	1million～1.5million	9	1,187,611	5	1,201,550	5	1,322,000
⑥	1.5million～	10	4,703,277	8	2,030,973	15	8,902,733

Response rate: 88%

Source：Field Survey

Table 2-21 Income Breakdown （all sample villages）

	agricultural products	livestock sales	wage/self-employment	remittance	rent	average income
①	23,474	3,125	7,792	11,670	0	46,060
②	69,264	11,744	56,385	35,985	513	173,890
③	120,033	48,750	145,458	73,750	83	388,075
④	271,883	50,781	304,344	44,319	0	671,327
⑤	616,276	90,842	424,789	94,737	0	1,226,645
⑥	1,292,266	51,894	4,536,455	83,030	645	5,964,289

resopnse rate: 88%

(U.Sh.)

※remittance and rent includes goods which is estimated by the average market price, except for clothes

Source：Field Survey

Figure 2-5 Composition of Cash Earnings（%）

Source: Field Survey

2-4-8. Composition of Household Expenditures

Composition of household expenditures for surveyed households is as shown in Figure 2-6 and Table 2-22.

As touched upon in previous sections, education is the largest expenditure item for households. Education expenditure includes tuition (for secondary education and above), purchase of school items and uniforms and money sent for boarding school. Many households in the surveyed villages were sending their children to secondary schools, including schools in Najembe and boarding schools in Kampala or suburban cities. Thus, in the survey area a tendency of educational investment by providing higher and better education to children was observed. It is predicted that the high rate of expenditure on education will continue in the future.

Figure 2-6 Compostion of Household Expenditure

Source: Field Survey

Table 2-22 Compositon of Expenditure

	Nkaaga	Buvunya	Kinoni
Education	31.99	24.63	40.73
Food	22.24	29.95	23.09
Health	16.33	20.06	16.43
Clothing	11.74	12.12	15.22
Family Ceremony	5.41	2.09	1.88
Construction & Renovation of house	3.83	2.66	0.08
Firewood	2.98	3.06	0.39
Bricks	2.09	3.01	1.09
Cermony for others	2.25	0.38	0.00
Charcoal	0.21	1.31	0.59
Others	0.93	0.72	0.49
total	100.00	100.00	100.00

※Excluded are production costs of agriculture & self-employment costs (%)

Source : Field Survey

2-4-9. Dependence on Forest Resources

As indicated in the previous chapter, forest resources including firewood and charcoal are used as fuel for most daily housework and cooking in Uganda. There are two major means to procure those fuels, i.e. harvesting from forest and purchasing in market.

Many households surveyed responded that they are using the nearby forest to harvest firewood for daily use Table 2-23. Households responding that they do not use the forest include those that were collecting firewood from their own property (e.g. garden and farm) as well as those that were purchasing all their firewood from the market. The amount of firewood collected shown in the table is based on a bundle consisting of 10 pieces.

As a result, we found that the amount of firewood procured is greater at households that collected firewood from their own property than those that went to the village forest in all villages. Interestingly, in Buvuunya Village which has the community-based organization (CBO) for forest conservation, there were 37 households that mainly used the village forest and exceeded substantially the number of those procuring from household property. This is congruous with the trend of brick production (which uses firewood for firing) being more active there than in other villages. It can be interpreted as the result of the official approval of rule-based resource utilization and the existence, approach and management by the CBO for surrounding forests to begin to function as a stable source of fuel supply. In another respect, the fact that the land size is comparatively small in this village as we saw earlier in this chapter may also raise the degree of dependence on surrounding

forests.[54] In this sense, this result can be seen as an aspect that emphasizes the raison d'etre of CBO and its future success.

Table 2-24 and Figure 2-7 evaluates the annual volume of firewood the residents are directly procuring free of charge from the forests (central protected forest and own forest) in monetary amounts and their ratio to household income. Classifications 1 through 6 conform to the hierarchy created according to income level in section 2-4-7 (also see Table 2-20).[55] Here, the appraised amount of procured firewood was calculated based on the lowest market price of 500 U.Sh. (= 34 yen) per bundle. Therefore, Table 2-24 shows the "minimum amount of cash expenditure required if firewood currently being procured in forests would be purchased in the market."

It must be noted that, owing to the nature of data, some values may become disproportionate in some cases as the number of households that are actually procuring their firewood from the forest (number of responses) becomes small when respondents are divided into income hierarchy.

In reviewing the ratio of procured firewood value to the household cash income in monetary terms, firewood value largely exceeds income as household income as income diminishes with the exception of Groups 1 and 2 in Kinoni Village. Figure 2-7 visually shows the economic impact of the percentage of appraised value of firewood to income with the 100% line showing the present level of cash income. One can easily predict a significant negative impact brought about on Group 1 and 2 households in the event of a depletion of present forest resources causing difficulty in procuring free firewood from the forest. In this sense, we must point out the importance of forest conservation that will enable the sustainable and stable supply of forest resources.

On the other hand, the number of households that are purchasing firewood and charcoal from the market were 46 and 7, respectively, for all villages combined. The percentage of the cost for purchasing these fuels in the total expenditure is shown in Section 2-5-8 (average by each village), which is negligibly small at 0.69% and 2.15%, respectively. The importance of the resource supply function of forests is further emphasized as these results from the surveyed villages confirm that the majority of fuel in the surrounding areas of forest is obtained through self procurement from the forest.

[54] Another possibility is that it was easy to give out information on realities of forest reserve utilization in Buvuunya Village where the rules for forest utilization are clearly defined in responding to the survey.

[55] As mentioned earlier, no significant difference in average number of family members was observed among these groups. Firewood consumption itself would not be affected by the number of family members either, considering the method of cooking all at once in a large pan.

Table 2-23 Dependence on Forest Resources for Fuel

Source	Source area	(%)	access days/month average	lowest	highest	mode	amount (bundle/year)	Minutes to site
Nkaaga (all sample households 74)								
households	56	*100.00*	56				53	52
own land	25	*44.64*	17.42	2	30	30	192.5	20.1
village forest	28	*50.00*	11.25	1	30	4	120.2	32.4
other village forest	3	*5.36*	21	3	30	30	88.7	53.3
Buvunya (all sample households 64)								
households	46	*100.00*	45				45	41
own land	6	*13.04*	20.8	4	30	30	157.17	9.4
village forest	37	*80.43*	9.25	1	30	4	129.37	36.7
other village forest	3	*6.52*	14	4	30	-	89.33	85.0
Kinoni (all sample households 57)								
households	37	*100.00*	35				25	32
own land	21	*56.76*	14.29	1	30	4	180.75	27.8
village forest	13	*35.14*	10.77	1	30	4	128.50	52.3
other village forest	3	*8.11*	5.33	2	10	-	114.00	120.0

※ one bundle = 10 pieces of firewood

※village forest: national forest alongside village. Other village forest: natonal forest alongside other village

※Minutes to site: with anwers that were based on kms, 1km=15 minutes

Source：Field Survey

Table 2-24 Annual volume of firewood directly procured free of charge from the forests

	Nkaaga		Buvunya		Kinoni	
	estimated value	ratio	estimated value	ratio	estimated value	ratio
①	72,278	220.32	76,667	262.32	39,286	75.02
②	53,357	36.25	54,231	33.56	62,800	34.92
③	45,625	13.24	43,250	10.74	36,000	10.39
④	59,893	0.09	60,556	10.03	18,250	3.24
⑤	116,200	0.09	92,750	7.67	55,000	4.28
⑥	123,367	0.07	58,750	2.75	64,167	1.58

Response rate：85% (U.Sh.)(%)

※ firewood estimated vaule is based on 1bundle=500U.Sh. Market purchased firewood is excluded

※ firewood amout is for household daily use regardless of national forest or private forest

※ ratio is an average of estimated firewood value to household income

Source：Field Survey

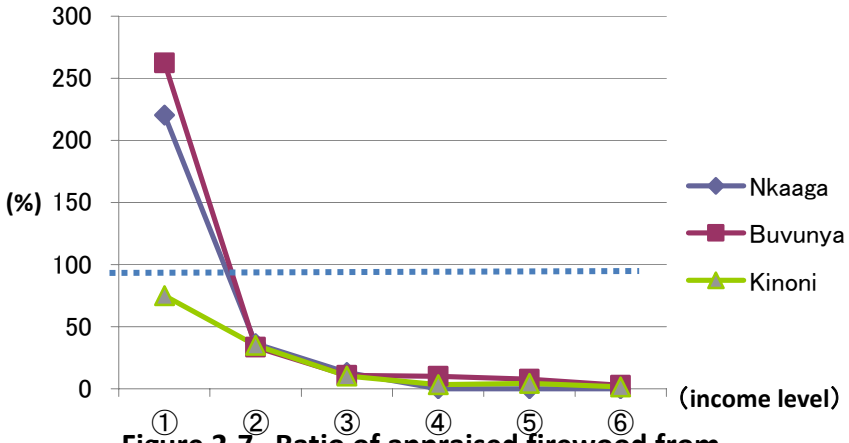


Figure 2-7 Ratio of appraised firewood from forest to cash income

Source: Field Survey

2-4-10. Perception of community-based forest management (CBFM)

Forest conservation activities in the survey area are as described in chapter1. This section will discuss the results of the perception of CBFM in respective villages (Table 2-25).

According to the response to Question 1, nearly half of the respondents were participating in CBFM in all villages. The meaning of participation in these results include various activities from positive conservation and management activities such as utilization of the forest in accordance with applicable rules or voluntary tree planting to conscious adherence to rules in daily use that has been promoted by awareness campaigns on forest conservation for instance. Slightly higher percentage of "Yes" in Nkaaga Village and Buvuunya Village is attributable to active efforts made by the village leader in the case of the former and to the existence of COFSDA which is the main entity of CBFM activities in the case of the latter. On the other hand, there were respondents that were not participating in CBFM because they were "not notified about such management activities." Such respondents were more prevalent among those living far from the village centre.

When asked about villagers' understanding of the penalties imposed on violation of CBFM rules (Question 2) as expected, half of the respondents knew that they would be subject to some penalty (i.e. Responses (a) to (d)). This percentage coincides with the response to Question 1. Meanwhile, the percentage of respondents that chose (f) "No penalties are imposed/should not be imposed" was particularly high in Kinoni Village. People in this village did not seem to be aware of serious penalties as Response (e) "Subject to guidance/instruction" and Response (b) "Fine" followed as next common responses.

Incidentally, attention must be given to the fact that doubts about fairness were contained in Response (f). One of the most important aspects in the management of common resources is prevention or avoidance of free riding. Unfair application of penalties not only goes against the fundamentals of conservation and management but

also diminishes people's willingness to participate in activities in the long run and runs the risk of causing greater resource deprivation than present in the worst case scenario.[56]

The extent to which CBFM rules are being observed was asked in Question 3. As a result, we have found that nearly half of surveyed households were aware of the existence of violators in Buvuunya Village and Kinoni Village.[57] While we were not able to confirm the number of such violators and whether they are from the same village, what matters is how such violations are being viewed by the residents. We asked this in Question 4. More than half were of the opinion that "They (violators) have their reasons" and "It is understandable," and largely exceeded those who claimed "They should follow the rules" and "Violators should be penalized." Actual reasons given for the response ranged from necessity of daily life to comments implying violation for commercial purposes and included "Poverty," "Having no other source of cash income," and "To make ends meet." At any rate, this degree of understanding for such violations suggests an existence of far-reaching need to rely on forest resources in the living environment and livelihood of the people. In other words, the results demonstrated the closeness of the relationship between forest reserve and its local residents and that consideration for people's livelihood is also a very important aspect.

No distinctive characteristic of Buvuunya Village where CBO named COFSDA[58] is located was revealed by this awareness survey. The result stands to reason because this CBO has been active for less than two years since the cooperation with NFA was started in this village. However, we expect further studies to be conducted in this area as it is true that a system involving a greater number of people has been formed and access to many kinds of technology and information has been realized here compared to other villages.

[56] Further study about such management side assessment as well as agencies and schemes (e.g. whether mutual surveillance of people is effective) will be needed in the future.
[57] Naturally, those who do not understand the CBFM rules will not say "Yes (I am aware of violators)."
[58] See paragraph 2-3-2.

Table 2-25 Perception of Community Based Forest Management

(1) Are you participating in CBFM activities?

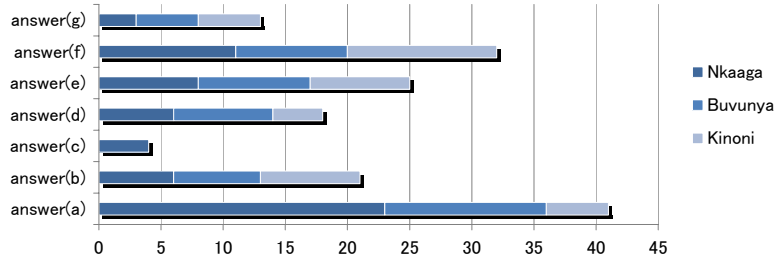
	Nkaaga	Buvunya	Kinoni
Yes	43	35	24
No	29	25	32
Participation rate(%)	59.72	58.33	42.86

response rate:96%

(2) What kind of penalty do you think you will get if you do not participate in the CBFM?

	Nkaaga		Buvunya		Kinoni		total
answer(a)	23	*37.7*	13	*25.5*	5	*11.9*	41
answer(b)	6	*9.8*	7	*13.7*	8	*19.0*	21
answer(c)	4	*6.6*	0	*0.0*	0	*0.0*	4
answer(d)	6	*9.8*	8	*15.7*	4	*9.5*	18
answer(e)	8	*13.1*	9	*17.6*	8	*19.0*	25
answer(f)	11	*18.0*	9	*17.6*	12	*28.6*	32
answer(g)	3	*4.9*	5	*9.8*	5	*11.9*	13
response rate	61	*100.0*	51	*100.0*	42	*100.0*	154

※ only one household answered mutiple (answer:number) (%)



(2) What kind of penalty do you think you will get if you do not participate in the CBFM?

answer(a)	arrested/jailed/go to court/flogged/heavy penalty/shot
answer(b)	fined
answer(c)	enforced planting
answer(d)	some form of penalty (depending on situation/small penalty/not explicit)
answer(e)	re-educated /persuaded
answer(f)	no penalty/should not be penalised (because not fair/too poor/too old)
answer(g)	don't know/no answer

(3) Do you know someone who is not following the community rules for CBFM?

	Nkaaga	Buvunya	Kinoni
Yes	28	28	22
No	40	24	27

response rate:87%

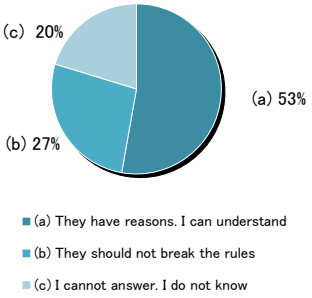
(4) What do you think about those who break the rules of CBFM?

	Nkaaga	Buvunya	Kinoni	total
answer(a)	31	29	23	83
answer(b)	16	12	14	42
answer(c)	15	10	7	32

response rate:81%

(a) They have reasons. I can understand
(b) They should not break the rules
(c) I cannot answer. I do not know

(4)What do you think about those who break the rules of CBFM?



Source:Field Survey

2-4-11. Economic Activities Utilizing Forest Resources

Several economic activities utilizing forest resources were observed outside of procurement of fuel for home use. Main activities consisted of three types of economic activities; i.e. "Firewood collection (for sale)," "Brickmaking (for sale)" and "Timber

harvesting (for sale)." "Brickmaking" uses a large amount of firewood for brick firing. Ten households that were engaged in such economic activities were interviewed.

A review of the characteristics of these households according to classification by the amount of cash income (see Section 2-4-7 and Table 2-20) showed that households in Group 2 tended to engage in "Firewood collection" while Groups 4 and 5 usually practiced "Brickmaking" and Group 6 was involved in "Timber harvesting." This tendency is likely to be affected by the fact that the amount of cash income these businesses bring in is directly reflected to their income scales. However, the contribution ratio of these businesses to total household income differed widely among households at 12 to 100%.[59] On the other hand, households that are engaged in "Timber harvesting" appear to be those that originally had some capital to begin with such as owners of retail stores and former village officials that were able to launch this business because of their ability to secure the equipment for timber harvesting. At any rate, a correlation can be found between income level and content of economic activities utilizing forest resources.

Regarding firewood collection as a business, as used in this survey and foregoing estimation, bundles of relatively thin branches and those having the shape of split trunk from a large tree were observed. The unit price for the former was 500 U.Sh. per bundle (10 pieces) (= 34 yen) but the price per bundle increased for thicker branches. However, it is hardly possible for a bundle of firewood to cost more than 1,500 U.Sh. (= 100 yen). Firewood shown in Photo 2-8 was made from a large trunk and was being sold on the side of an arterial road. It was priced at 250 U.Sh. (= 17 yen) for three pieces and 10,000 U.Sh. (=670 yen) for one pile.

Brickmaking starts by mixing mud with water, shaping it by putting it in a wooden mold and drying it in the sun. After drying, bricks are fired in earthen furnaces where a large amount of firewood is used. According to a brick maker, four 3-ton truckloads of firewood are needed to produce 30,000 bricks.[60] To make a furnace itself that can fire 15,000 bricks in a single batch, it would take two to three people about two days. The said quantity of bricks is finished after firing in the furnace for four days and cooling them for another four days. A brick is sold for 60 to 100 U.Sh. (= 4 to 7 yen). Unit price depends largely on the quality of the brick and is determined by its shape and color which represents its rigidity. Wages for brick molding is said to be about 10 U.Sh. (= 0.7 yen) for each piece. Children were engaged in this work in the survey area.

The economic outcome of timber harvesting is also affected by the variety and size of the tree. Muvule (Iroko) which are said to be the most expensive wood after Mahogany are highly valued materials for furniture while Eucalyptus which are being planted through various tree planting programs are valued as materials used for scaffolds and roof supports.

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[59] Households that are 100% dependent include those specializing in brickmaking and those that have no other source of cash income. These household also grow crops that they consume at home.

[60] The amount of a truckload of firewood is an estimation and will be close to 4 tons if the amount of firewood exceeds the truck's load capacity. Meanwhile, dry firewood can weigh as low as 2 tons.

Photo 2-8 Firewood seller alongside an arterial road near the surveyed village

2-5. Conclusion

We have discussed the realities and characteristics of household economies and their relationship to forest resources by using the results of the household survey. In conclusion, concerning the title of this survey "Impact of Population Problem on Agricultural and Rural Environment", considerations that are directly or indirectly induced from these results and some notes about the implementation of the survey on these topics will be added here to wrap up the survey.

The first aspect that must be considered is maintenance of the forest function as a stable supply source of fuel resources. Households in the surveyed area were collecting the fuel they use on a daily basis from their surrounding forests. The survey results confirmed that low income groups would be affected first and foremost in the event that forest resources are reduced or depleted and it would become difficult to gain access to this fuel resource. Deprivation of relatively scarce forest resources may occur should population density rise in the surrounding region. It will be important to clarify the rules with the aim of maintaining and managing the resource volume, implement management reciprocally among the people and maintain the resource supplying function of the forest to prevent such a situation from arising. In this sense, it is necessary to follow the results of COFSDA which is the CBO in Buvuunya Village.

In addition, these low income households tended to rely heavily on agricultural income for their livelihood. Population growth that may well occur in the future will create pressure for further segmentation of farm ownership (which already was below three acres for more than half of the households in the present survey). In that case the only measure left for farmers is to raise the profitability per unit of land. The currently adopted inter-cropping system has partially realized this, in which effective land use has materialized with utilizing space by mixing tall matooke with short legumes. In addition, staple crops that can be harvested throughout the year play the role of commercial crops simultaneously and enable farmers to earn cash in the event of contingency and offers an effective strategy for stabilization of income.

As a result of combining these two aspects mentioned above the effectiveness of agro-forestry emerges in which tree varieties that can supply firewood are planted in

inter-cropping farms. Agro-forestry itself is similar to recreating a natural forest system as it improves crop yield by raising the soil fertility under the trees and offers medicine and food to people or livestock in some cases. At the same time, trees drop their leaves and branches in addition to being pruned and thinned occasionally, thereby contributing fuel to households. We were not able to extend our survey to include the extent to which farmers are planting trees along with their cultivated crops and the role such tree varieties play. Agro-forestry is already being promoted in some regions by NAADS, an agricultural extension organization discussed in Chapter 1, for instance, and the need for detailed survey and research in this field as well as for implementation of promotional activities is expected to increase as the importance of forest conservation and tree planting is being recognized.

Monoculture farming of sugarcane cultivation practiced in the survey area can be positioned at the opposite end of the spectrum with agro-forestry.

As we have seen in the section on farm income, income earned from contract farming of sugarcane was far greater than that of other farms that practiced inter-cropping of food crops for home consumption and commercial crops. It is all the more true for households that can pursue economies of scale. While we were not able to study and analyze this matter in detail in this survey, these contract farmers would provide more employment opportunities and other benefits to the community.

Nevertheless, warnings have been sounded over many years on the negative side of monoculture farming. In the light of the natural environment in the surveyed area, a concern exists over large-scale depletion of natural forests for the purpose of securing farmland for monocropping. In connection with household economy, it could intensify concentration of land and wealth and expand disparity within the village. Producers themselves have relatively weak bargaining power compared to the company that they enter into contract with, which means that they also have to cope with production risks and price fluctuation risks on their own in the context of dependence on those companies. Such concerns can be identified in several items of our household survey results.

Lastly, a noteworthy challenge in connection with the implementation of the survey is to remove the possibility of ambiguity of that were recognized anew in our survey was ingenuity to grasp: 1) planted area, yield, volume of sales and consumption in household survey where inter-cropping is being practiced; 2) resource utilization, form and method of use in studying forest utilization; 3) unconscious agreement or informal institutions among people that includes utilization of other common resources that would give effectiveness to rules for forest management in addition to simply understanding of direct and clear rules.

Chapter 3　Challenges of International Cooperation

European countries have experience in international cooperation for Africa, including accumulation of enormous survey data owing to historical background, while Japan has just launched cooperation in full scale. However, it is true that, because of such historical background, African countries have psychological resistance against receiving support from Europe. In this sense, African countries have high expectations for Japan because they have had no conflict of interest in the past. Moreover, many heads of state and prime ministers from African countries are scheduled to attend TICAD IV which will be held this year in Japan. It precisely represents their expectation for cooperation from Japan, and the effectiveness with which we respond to such expectation poses an important challenge for Japan. Our survey sheds light on the reality in which population increase is affecting the environment which constitutes the basis for agricultural and rural development. On the other hand, we became aware of a lack of fundamental data and realized the importance of basic surveys and study in order to clarify the direction of international cooperation in the African region. Recommendations for actual cooperation are as follows.

3-1. Recommendations on Official Development Assistance for Uganda

3-1-1. Purpose of Survey

The Japanese Government stated in the ODA Charter, which was revised in August 2003, that it "plays an active role in issues of global scale such as the environment, infectious diseases, population and food." Emphasis is thus placed on comprehensive issues such as the environment, population, food security, and agriculture and rural areas as they are closely connected with these issues.

Under these circumstances, this survey focused on population as one of the factors that affects agriculture and rural environment. The survey project was conducted in the Republic of Uganda (hereinafter "Uganda") with the aim of studying and analyzing the correlation between population growth and environmental deterioration in rural areas such as desertification, identifying the present condition of environmental problems that are occurring in agriculture and rural areas amidst ongoing population growth and their solutions, and contributing to effective and efficient cooperation in agriculture, forestry and fisheries in the future.

We would like to offer our recommendations on ODA for Uganda in the following sections based on knowledge obtained and information collected in the field survey and analysis based on such findings.

3-1-2. Present Condition of Uganda and Its Economic Policies

As shown in this report, the population of Uganda is predicted to increase on a continual basis for the next several decades. Although a decline in total fertility rate (TFR) has been observed in the recent survey, population growth rate remains on the 3% mark. Considering the fact that a woman gives birth to about six children, a rapid decline in population growth is unlikely without some kind of intervention.

For this reason, supply of food for supporting the rapidly increasing population of the future is a pressing issue. However, the Government of Uganda has limited awareness about increasing food production with not enough discussion taking place on this subject. Rather, the Government of Uganda appears to be bringing in foreign capital and advancing capital formation in order to build the foundation for sustaining stable economic growth by carrying out policies for industrial development that would support rapid population growth and by fostering export industries along with the expanding domestic market.

In reality, however, there is evidence that national policies for attracting investment for economic foundation building has been accompanied by some cases of forest resource depletion. In particular, assignment of national forest reserves to foreign capital for factory construction has become the target of criticisms from students and NGOs in the process of fostering the manufacturing industry through an influx of foreign capital.

In the recent years, the policy in Uganda has been to actively accept foreign capital in order to foster the manufacturing industry, disseminate production technology and promote environmental conservation activities based on financial assistance from foreign donors.

For this reason, the issue here is not the criticism of lack of environmental considerations but the contradiction in policy management of accepting financial assistance from foreign donors involved in environmental conservation while receiving investments from private enterprises that may harm the environment. An antinomic policy management of maintaining environmentally-conscious stance on one hand and inviting companies that may bring about environmental destruction on the other may be inevitable considering the present situation of the Ugandan Government, and may well boil down to the question of political assessment of how one should weigh the realistic response and measures for solving the problem.

Setting aside the issue of political assessment, however, the situation could worsen further unless some measures are taken against the advancement of deterioration of forest resources. For this reason, the essential challenge for Uganda lies in harmonizing its growing population with the natural environment so that the two can coexist, in particular, how to address the environmental deterioration of agriculture and rural areas that results from rapid population growth. In other words, in addition to various challenges related to economic foundation-building of how to obtain the means for hiring and utilizing the growing population as labourers, the question is whether the means of labour utilization can be employed in a harmonious manner against environmental deterioration of agriculture and rural areas that play the role of agricultural production base and how to hold back the trend of deteriorating natural resources resulting from population growth. How to embark on practical policies with considerations for the “conservation of the natural environment” and “promotion of economic growth” is the essential challenge Uganda is facing today.

3-1-3. Rural Level Challenges and ODA Recommendations

There are two aspects to the deterioration of forest resources occurring in Uganda today. The first aspect is the fact that forest resources are being depleted and forest area is diminishing as a result of growing demand for lumber, charcoal and firewood

that accompanies population increase and has already become a social issue in some areas. The second aspect involves dwindling forest resources following the increased need for construction materials in the cities. Furthermore, some point out that forest resources are being cut down for the convenience of transportation and resources in forests adjacent to major roads are rapidly declining.

In particular, the first aspect is directly related to the livelihood of rural residents living near the forest. Ninety percent of fuel used in Uganda depends on the forest. Firewood and charcoal are usually used for household affairs. Electricity is rarely available and power supply is far from meeting the present demand. As urban dwellers mainly rely on charcoal as the fuel for household affairs, production and sales of charcoal serve as an important source of cash revenue for people living in the vicinity of forests. Meanwhile, people in rural areas still use firewood for cooking and are unable to abandon their use of this fuel. In this sense, the conservation of forest resources are usually positioned as an essential activity for maintaining livelihood. Many educational activities for the prevention of unrestrained logging of forest resources and activation of resource conservation are currently being launched and activities for the protection of common land through village level rulemaking concerning the collection of firewood and lumber have been started in some regions. Whether they can offer the system and requirements for coping with future population increase is an important question.

In this sense, activities for forest conservation must be implemented on a livelihood level in rural areas where an overwhelming majority of the population live. For instance, a form of assistance enabling the people of rural areas to improve the heat efficiency of firewood and cook with less firewood through dissemination of the "fuel efficient stove" is realistic and effective. In regions where mixed cropping is popular, it is also possible to promote agro-forestry and expand farm management while realizing procurement of firewood from people's own properties. A direction of introducing a lifestyle using alternative energies such as biogas and solar is also possible in the long run.

The second challenge is the increasing use of the forest for construction materials including lumber and brick. While the former signifies direct use of forest resources, the latter also involves considerable consumption of firewood for brick firing and represents indirect use of forest resources. In addition, a large amount of lumber is used for scaffolding at construction sites. For this reason, the construction boom originating from the population increase and recent economic growth will inevitably have a negative impact on forest resources regardless of the construction method.

The goal lies not in the prohibition of forest resource use but in the design of a framework for efficient utilization of forest resources and an integrated effective system to provide knowledge on this and the development of human resources for that purpose. In addition, it will be necessary to examine in greater detail the types of methods that are available for creating systematic forest management and efficient distribution and logistics of forest resources. It should be possible to consider such methods on all levels- national, municipal, and community levels.

In reality, community-based natural resource management, which has been the principle of resource management in recent years and was also referred to in this report, is affecting the environmental administration of Uganda. "Village level rulemaking concerning collection of firewood and lumber" mentioned above refers to

policymaking and recommendations that were implemented by the government along these lines. These activities have been gradually permeating into local areas since 2000.

Village residents mentioned the negative aspect of forest protection as a system that eliminated even the daily resource utilization for livelihood and looked back on those years as a state of dilemma in which they had to continue collecting the firewood they needed despite the risk of being arrested for illegal collection. However, we were also told by local people that such a dilemma has been overcome through efforts for community-led forest management and sustainable use. In one of the villages where the survey was conducted, the rules for firewood and lumber collection had actually been drawn up by the community organization that was formed for community-based forest management (CBFM) which in itself is worthy of praise.

However, a question remains concerning the scientific validity of this rulemaking (e.g. whether the rules were made in accordance with vegetation data). Moreover, we were not able to determine in our short survey period to what extent the scrupulous rules explained by the village council members and core staff members of community organization have been shared and implemented among the people in the community. What came to surface as a result of the survey was the need to support people's efforts towards CBFM by having some idea about its limits instead of blindly praising such efforts. Once the procedure of making rules under the community's initiative itself becomes the end in itself, it will be almost endlessly modified by forest resource utilization and management rules owing to numerous pressing problems of people's daily lives that emerge one after another (e.g. rapid population increase in the village). As a consequence, the rules themselves will be become practically nullified and incapable of restraining the decline in forest resources. In other words, rules themselves tend to rely heavily on village livelihood because they are prepared through participation of the people and have the potential of being modified into those that do not guarantee the effectiveness with regard to maintenance and conservation of forest resources. It signifies the possibility of an ironic situation in which forest resources are significantly deteriorated and the rules lose their substance despite the existence of rules for collection of forest resources.

Therefore, rulemaking and a support system based on expertise in subjects such as vegetation of surrounding areas and forest resources of Uganda as a whole while taking into account the actual situation of the villages will be needed in establishing the rules. At the same time, they must be formed through participation and consensus of villagers rather than by "high-level decision making." Needless to say, rulemaking for firewood and lumber collection confirmed at the village of our field survey was a new attempt that has not even been in place for five years and should not be subject to any definite assessment at this point in time. However, cooperation is required in terms of knowledge and technology on sustainable use of forest resources for further development in the future. It has the potential of building a new form of development aid based on livelihood needs of the society and ongoing dialogue about knowledge and technology through the dispatch of experts on forest resources and vegetation.

Moreover, several villages encompass the area of forest reserves. It is for this reason that mid-level local councils (i.e. councils between district and village levels consisting of county, sub-county and parish), whose roles have yet to be clearly defined in the process of promoting awareness-raising of CBFM, need to be addressed. Our hearing

survey also confirmed the existence of subtle differences in the rules of forest use among villages. Existence of significant difference among villages in rules on utilization of resources at the same forest reserve is not desirable when CBFM advances in the future. In such an event, it will be necessary to loosely adjust the activities of the people in the vicinity that are using the resources from the same forest reserve. Along with the aforementioned experts on forest resource utilization and management, the mid-level county-, sub-county- and parish-level councils should be able to play some role in such adjustment.

Matters that these councils can actually implement include sponsoring study groups and conferences for such adjustment as well as organizing study tours to other regions. In the hearing survey, the rural inhabitants living adjacent to the vast Mabira Forest Reserve were using the forest on a daily basis and did not think of the diminishing forest itself as a pressing problem. For this reason, the tactic of organizing study tours to villages in other regions where forests have diminished considerably and having people learn through mutual exchange with the people in such regions should be effective.

3-1-4. National Level Challenges and ODA Recommendations

It goes without saying that attempts to protect forest resources are facing difficulties under the present circumstances in which people use firewood and charcoal to cook on a daily basis and construction is booming with economic growth. On the other hand, as some of the aid programs implemented by the World Bank are infrastructure-building projects such as the construction of hydroelectric power plants, and infrastructure improvement that has the potential of meeting the growing demand for power and reducing the consumption of forest resources on a large scale it should not necessarily be denounced in view of macroeconomic trends and predicted population increase. Infrastructure improvement, however, does require the implementation of an environmental assessment to consider the burden on the environment in the short term and termination of a project that would cause consumption of forest resources on a large scale as a result of economic growth. Fostering an environmentally-friendly industrial structure in the long term is necessary. At minimum, we believe that building infrastructure to meet the increasing demand for electricity alone is not harmonious with the trend of environmental conservation among the western donor countries and may well downgrade their opinion of the investment climate in Uganda.

With regard to growing population, the number of births still remains high particularly in rural areas and population growth is predicted to continue in the future. While it would create a larger labour force and generate greater domestic demand, it runs the risk of causing further environmental degradation including reduction of forest resources and leaving many problems unsolved unless change in current lifestyle highly dependent on forest resources for most of its fuel is carried out smoothly. As stabilization of population is a very effective measure for addressing this issue, it is necessary to draw increasing attention to population policy among policymakers and the public. In concrete terms, implementation of a population policy including the development of family planning and female education activities is needed as it has been shown in Uganda that fertility will decrease by improving the education of women.

The system of economic incentive in which people benefit economically by conserving

forest resources has not yet been fully implemented and attempts for ecotourism, combining forest protection and tourism, have just begun in rural areas of Uganda. Apart from ecotourism, upgrading of the institutional mechanism is needed, however, it is difficult to expect full support from municipalities beyond their regular activities as they are experiencing a financial squeeze on top of staffing shortages amidst advancement of decentralization. In a developing country that already has forest resources like Uganda, review and introduction of an institutional mechanism in which economic merits are granted for conservation of forest resources is required. However, the fact that an institutional mechanism for granting economic merits toward the conservation of forest resources has not emerged is a problem rooted in the framework of global warming prevention that acknowledges emission rights for afforestation alone and does not recognize the economic value of existing forest resources.

Such an institutional framework is not an issue that can be addressed through the system of a single country. There is a need for international discussion of an institutional mechanism that would link forest resource conservation to economic benefits.

3-1-5. Conclusion

The case of Uganda demonstrates a pattern in which economy-oriented development projects would be practical at least in the short term but such projects themselves may bring about environmental deterioration. The top priority challenge facing the Ugandan Government is how to consider this trade-off between conservation of the natural environment and advancement of economic growth in view of the context of a rapidly growing population and create a realistic policy that acknowledges the "economy" and "environment and sustainability."

Population growth is still advancing rapidly in African countries and cases of environmental degradation including desertification are being reported. Considering the eradication of poverty through economic development realized by international aid, environmental degradation is predicted to advance further in many African countries and regions as a result of population increase despite implementation of development aid. As a result, African countries must develop a policy that addresses this conflict between sustainable use of the natural environment and improved economic growth keeping in mind the high population growth rate.

This pattern coincides with the case already observed in Uganda. In this sense, the case of Uganda can be viewed as a typical precursory case of African society, making the review of ODA assistance to Uganda all the more significant in considering the direction of future support for Africa.

Appendix: Survey Member, Cooperator, Itinerary and Collected Materials

1. Survey Committee

(1) National Committee

Yonosuke Hara	Professor, National Graduate Institute for Policy Studies, GRIPS
Yasuko Hayase	retired Senior Researcher, Development Studies Center, Institute of Developing Economies, IDE
Jun Ikeno	Associate Professor, Graduate School of Asian and African Area Studies, Kyoto University
Eiichi Yoshida	Research Fellow, Area Studies Centre, Institute of Developing Economies, IDE
Soichiro Shiraishi	Ph.D Candidate, Graduate School of Asian & African Area Studies, Kyoto University
Yoko Ichijo	Ph.D Candidate, Graduate School of Agriculture, Division of Natural Resources Economics, Kyoto University.
Osamu Kusumoto	Asian Population and Development Association （APDA）, Executive Director/ Secretary General
Shoichi Sato	APDA　Senior Expert
Masanori Takemoto	APDA　Programme Manager/Researcher
Yuji Mizukami	APDA　Researcher

(2) Survey Member （October 1, 2007 – October 19, 2007）

Soichiro Shiraishi	Survey Team Leader
Yoko Ichijo	Survey Team Member
Masanori Takemoto	Survey Team Member

2. Cooperators

① Embassy of Japan in Uganda

Kotoha Itakura	Third Secretary, Head of Economic Cooperation Section

② JICA Uganda Office

Takehiro Susaki	Resident Representative
Hitoshi Fujiie	Assistant Resident Representative

③ Uganda Parliamentarians' Forum on Food Security, Population and Development (UPFFSP&D)

Chris Baryomunsi	Chairperson
Jane Alisemera Babiiha	Vice Chairperson
Kasamba Mathias	Secretary General
Nayiga Florence Ssekabira	Treasurer
Sylvia Namabidde Ssinabulya	Publicity
Sabila Herbert	Member
Muwuliza Norman Ibrahim	Member
Ruth Kavuma Nvumetta Lutaya	Member
Wamala Buyungo Musa	Programme Coordinator
Nakiganda Christine	Staff
Mulumba Mathias	Researcher

④ Member of Parliament, Uganda

James Kakooza	Finance Committee & Economic Planning
Grace Oburu	Woman MP for Tororo District
Muwulize Norman Ibrahim	Buikwe County West Constituency
Turyahikayo K. Mary Paula	Rubabo Consituency, Rukungiri District

⑤ Ministry of Health

Anthony K. Mbonye	Reproductive Health Division

⑥ Ministry of Water, Lands and Environment

Maria Mutugamba	Minister of Water & Environment
Jesca Eriyo	Minister of State for Environment

⑦ Ministry of Agriculture, Animal Industry & Fisheries

Connie Acayo	Principle Information Scientist

Yusuke TADA	Agricultural Planning Department
Byaruhanga K. G	Supervisor T/Works/Draughts
Hank A	Senior Agriculture Officer/Irrigation
Paul Laboke	Senior Agriculture Officer/Food Crops
Annunciata Hahuza	Economist/Food Security

⑧ Food and Agriculture Organization (FAO) of the United Nations

Beatrice A. A. Okello	Programme Assistant
Jimmy Owani	Assistant Emergency & Rehabilitation Coordinator

⑨ Uganda National Farmers Federation (UNFFE)

Mwendya Augustine	Director Agri-business Development
Sarah Tibaidhukira Kayanga	Training and Agriculture Advisory Manager

⑩ National Agricultural Advisory Services (NAADS)

Sally Bastow	Technical Advisor
Agnes Akwang Obua-Ogwal	Planning, Monitoring & Evaluation Officer

⑪ Uganda Co-operative Alliance LTD.

Leonard Msemakweli	General Secretary

⑫ National Forestry Authority (NFA)

Peter Kityo	Field Services Specialist
Fiona Driciru	Community Partnership Specialist
Leo Twinomuhangi	Sector Manager Mabira
Maiko Kumamoto	JICA/JOCV

⑬ United Nations Population Fund (UNFPA)

Nestor Owomuhangi	National Programme Officer
Kamoga Joseph	National Programme Officer (HIV/AIDS)
Henry Kalule	Assistant Representative
Brenda Kifuko Malinga	Programme Officer
Brenda Malinga	National Programme Officer

⑭ National Environment Management Authority (NEMA)

Kitutu Kimono Mary Goretti	Environment Information Systems Specialist
Ronald Kaggwa	Environmental Economist

⑮ Advocates Coalition for Development & Environment (ACODE)

Onesmus Mugyenyi	Agriculture Executive Director
Arthur Bainogisha	Director of Research
Byadugaba Emmny Magezi	District Councillor

⑯ Enviro Care Initiative

Freddy Ntege Lukwama	Coordinator
Stephen Baguma	Member
Otai Herbert	Community Development Officer
Abubakar Moki	Member
Tuyite Ntege Yudah	Project Secretary
Phillip Ssekimpi Kakembo	Chairman
Wavamunno Nasser	Researcher
Philip Ssekitto	Member
Milly Iga	Member
Mulondo Samuel	Member
Musawd Resty Namuganga	Member
Lule Rose	Member
Kayaga Betty	Member
Nabukegra Sylvia	Office Assistant
Kigudde Wilson	Member
Ssembatya Richard	Member
Mwebage Moses	Member

⑰ Research Assistants

Mulumba Mathias	Research Assistant
Wavamunno Abdul Nasser	Research Assistant
Nakintu Rashidah Roslen	Research Assistant
Kasawuli Joseph Mukasa	Research Assistant
Tumukunde Christopher Baingana	Research Assistant
Muramuzi Michael	Research Assistant
Nassiwa Hadijjah	Research Assistant
Semaganda Edward	Research Assistant
Nabalamba Asmat	Research Assistant
Niwagaba Beatrice	Research Assistant

⑱ Miscellanious

Sserwanga Lawrence	Mukono District Secretary
Isabirye Juma	Chairperson LC3 Najembe Sub County
Golooba Jimmy	Najembe Sub Country Chief/Senior Assistant Secretary
Byarugaba E. Magezi	Health Coordinator Makiro Deanery Health Catholic Services
Sato Yasuaki	Ethnobotanist, Graduate School of Asian and African Area Studies (ASAFAS), Kyoto University

3. Itinerary

1-Oct (Mon)

・22:45 Depart from Nagoya (EK315) (TAKEMOTO)
・23:15 Depart from Kansai International Airport (EK317) (ICHIJO)

2-Octo (Tue)

・4:45 Arrive at Dubai（TAKEMOTO）
・4:45 Arrive at Dubai（ICHIJO）
・8:25 Depart from Dubai (EK723)　14:45 Arrive at Entebbe (ICHIJO, TAKEMOTO)
・Visit to the Joint Symposium of Makerere University, Kyoto University and JSPS at Makerere University.

3- Octo (Wed)

・Visit to the Joint Symposium of Makerere University, Kyoto University and JSPS at Makerere University.
・Material Collection (Map, Statistics, Reports)

4-Octo (Thu)

・Visiting to National Diet of Uganda.　Courtesy call to Dr Chris Baryomunsi, Chairperson, Uganda Parliamentary Forum on Food Security, Population and Development.
・Consultation with Ugandian counterpart about survey mission.
・Visiting to JICA Uganda Office. Briefing on Agriculture and Rural Development in Uganda from Staff, Embassy of Japan and JICA Staff.

5-Octo (Fri)

・Visiting to the Ministry of Agriculture, Animal, Husbandry and Fisheries. Briefing on outline of agricultural situation in Uganda and discussing about survey program.
・Visiting to the Plan for Modernisation of Agriculture (PMA) and National Agricultural Advisory Services (NAADS). Briefing on outline of agricultural situation in Uganda and PMA and NAADS's role and activities.
・Visiting to the Ministry of Water, Lands and Environment. Discussion with Minster of Environment about situation and policies of Environmental protection.
・Visiting to the National Environmental Management Authority(NEMA). Briefing about Environmental policies and its institutional scheme.

6-Octo (Sat)

・Visiting to the Local NGOs/National(International) Organization on Environmental support in Rural Area. Briefing on its activities and problems which are faced.
・Material Collection (including air photo/field map, statistics, reports etc.)

7-Octo (Sun)

・Move from Kampala to the surveyed area. Visiting to the village
・Discussion about field survey with coordinator.
・Meeting District Leaders and visiting to Population office, Agriculture office and Environmental office. Briefing about the village situation from District leader and others.

8-Octo (Mon)

・Visiting to Parliamentary Committees: Agriculture, Animal Husbandry, Fisheries. Natural Resources, Social Services.
・Visiting to the Committee of HIV/AIDS, Ministry of Health and Uganda AIDS Commission. Briefing on HIV/AIDS impacts to the Rural Development.
・Visiting to the Uganda Bureau of Statistics and Population Secretariat.

9-Octo (Tue)

・Visiting to the Ministry of Health. Breifing on Public Health, General information on Population including birth rate and death rate, and Population related issues.
・Visiting to the Ministry of Finance & Planning. Briefing on Ugandan Ecnomy, Rural Development, the macro policies and investment from foreign countries.

10-Octo (Wed)

・Visiting to the UNDP. Breifing on the multilateral aid scheme towards Ugandan Government.
・Visiting to the UNFPA.Breifing on Ugandan Population Dynamics and UNFPA activities.
・Visiting to the Local NGOs/National(International) Organization on Environmental support in Kampala Area. Briefing on its activities and problems which are faced.

11-Octo (Thu)

・Move from Kampala to the surveyed area. Visiting to the village.
・Discussion about field survey with coordinator.
・Conducting field survey in the surveyed village.
・Data input and processing the data.

12-Octo (Fri)

・Conducting field survey in the surveyed village.
・Data input and processing the data.

13-Octo (Sat)

・Conducting field survey in the surveyed village.
・Data input and processing the data.

14-Octo (Sun)

・Conducting field survey in the surveyed village.
・Data input and processing the data.

15-Octo (Mon)

・Conducting field survey in the surveyed village.
・Data input and processing the data.

16-Octo (Tue)

・Visiting to the National Forestry Authority (NFA) Mabira office. Breifing on the forestry policy and NFA activities on Mabira forest reserves.
・Move from the surveyed area to Kampala.
・Visiting to the NFA on Ugandan forestry policy.

17-Octo (Wed)

・Material Collection.
・Data input and processing the data.
・16:15 Depart from Entebbe (EK 724) (ICHIJO)

18-Octo (Thu)

・00:45 Arrive at Dubai (ICHIJO)
・2:35 Depart from Dubai (EK316) 17:20 Arrive at Kansai International Airport (ICHIJO)
・Material Collection (SHIRAISHI, TAKEMOTO)
・16:15 Depart from Entebbe (EK 724) (SHIRAISHI, TAKEMOTO)

19-Octo (Fri)

・00:45 Arrive at Dubai (SHIRAISHI, TAKEMOTO)
・2:35 Depart from Dubai (EK316) 17:20 Arrive at Kansai International Airport (SHIRAISHI, TAKEMOTO)
・18:35 Depart from Kansai International Airport (EK6252) 19:45 Arrive at Haneda (TAKEMOTO)

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