

Chapter 4 Existing Conditions of the Communities of the Study Area

In this Chapter, the results of the Study conducted to understand the existing conditions are presented for the planning of community development plans of the Study Area. Firstly, we studied and listed the potential actors including administrative organizations and other institutions, who were supposed to be responsible or involved in the community development activities. Secondly, the present conditions of the Study Area were understood by putting together the results of exploratory field studies, community profile studies, workshops, etc. And, based on the understanding, the Study Area's issues and needs were sorted out. Using the information, potentials and constraints of community development in the Study Area were sorted out and an analysis was carried out on the target communities of the Study Area.

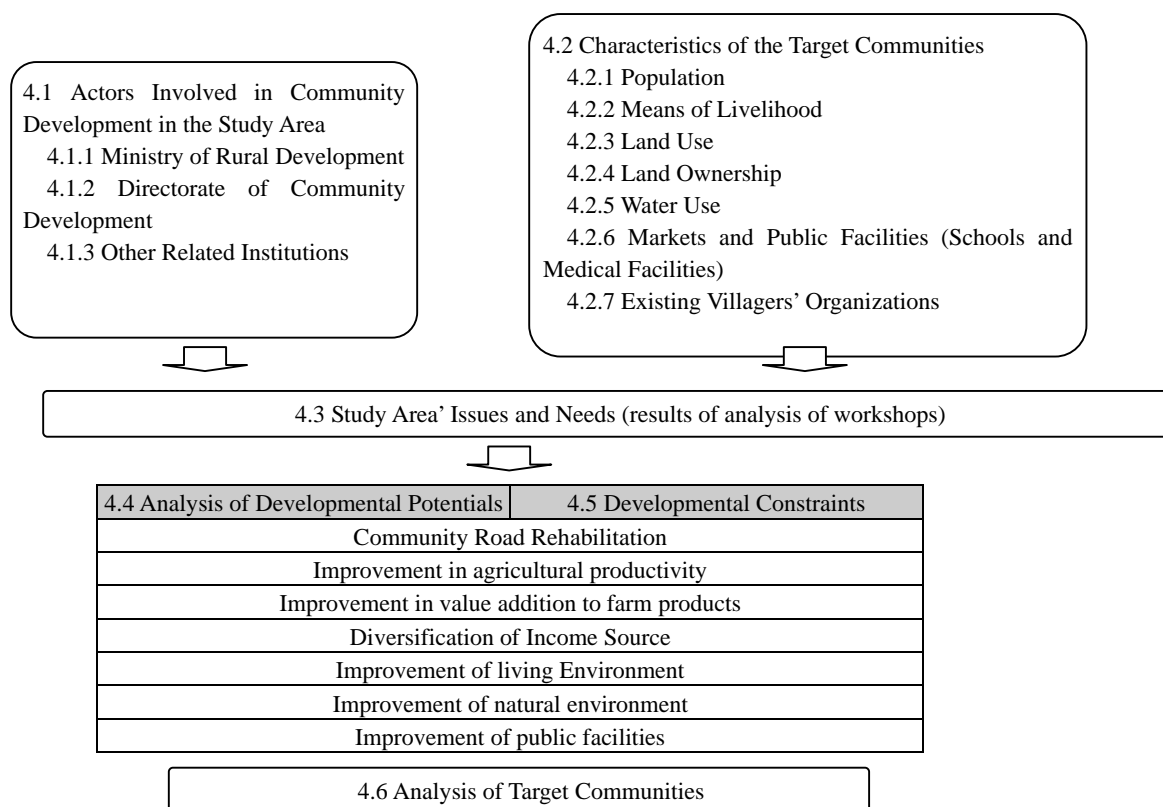


Figure 4.1 Flow of Analysis of Target Communities

4.1 Actors Involved in Community Development in the Study Area

For formulating community development plans, it is necessary to understand the actors who are involved in the community development process in the Study Area. Such actors are shown below.

4.1.1 Ministry of Rural Development

In 1977, when the Ministry of Rural Development was established as the competent administrative for community development, its roles were not clarified because of an institutional

reason, but the ministry's role was prescribed in 1986. In accordance with the Government Decree put in force on May 16, 2007, the Ministry of Rural Development is now charged with the following responsibilities:

- (1) Planning and management of development projects in local regions, rural areas and city fringes;
- (2) Establishment and guidance of associations in rural areas and organizations of farmers;
- (3) Formulation and supervision of rural development policies and strategies;
- (4) Organization and guidance to villagers to improve agricultural productivity;
- (5) Improvement of rural environment and facilities;
- (6) Coordination and integration of development plans in rural areas;
- (7) Implementation of enlightenment activities for villagers and guidance to stabilize their livelihood;
- (8) Promotion and support for inland water fisheries in rural areas; and
- (9) Improvement, construction, rehabilitation, maintenance and management of basic social and economic infrastructure in rural areas such as community roads, water source facilities, gravity water channels, local drinking water facilities, etc.

4.1.2 Directorate of Community Development

The Directorate of Community Development (hereinafter referred to as "DECO") is a directorate under the supervision of the Ministry of Rural Development and belongs to the Central Management Service of the Rural Development Office. DECO has been charged with the following responsibilities:

- (1) To promote the improvement of farmers' income and stability in their livelihood as well as to organize and give guidance to villagers so that the rural facilities for providing goods and services which contribute to the national development process are properly maintained and managed;
- (2) To get the villagers involved in the implementation of the national development policy formulated by the government;
- (3) To play the role of interfacing development organizations and other partners;
- (4) To provide training, advice and arbitration of conflicts to primary organizations such as individual associations and to support their self-sustaining development; and
- (5) To promote the application of a resident-led approach to development through which villagers voluntarily participate in the development process.

In addition, DECO, as a Directorate in charge of the provision of enlightenment, guidance, awareness expansion and education to villagers through rural education activities, has the following established goals:

- (1) To alleviate poverty through programs to develop villagers' capacity and to contribute to the national development process by encouraging the individual villagers and their organizations to

make efforts (long-term overall goal);

- (2) To improve the basic capacity of the communities by promoting villagers' training, education and leadership as well as to advance activities contributing to the improvement of livelihood through highly productive projects and to support villagers in the establishment of villagers' organizations in collaboration with related institutions (mid-term strategic goal); and
- (3) To prepare programs for the development of leaders, education of villagers, enlightenment activities, mental training, new technology introduction, etc. as well as to formulate projects for partners involved in the development process and to evaluate the impact of these projects (short-term practical goal).

4.1.3 Other Related Institutions

Except for the Ministry of Rural Development and the DECO, an institution related to the community development in the Study Area is a Directorate under the control of the Ministry of Rural Development and belongs to the Central Management Service of the Rural Development Office called the Directorate of feeder roads (hereinafter referred to as "DVDA"; 17 province-level employees). Other responsible institutions and individuals are the Ministry of Agriculture, Rural Development, Fisheries, Animal Husbandry and Small and Medium Enterprise Promotion of Bas-Congo Province and rural development inspectors, community road maintenance and improvement inspectors, agriculture inspectors assigned to each level of Bas-Congo Province, Cataractes District and Songololo Territoire. Besides, there are lowest-end administrative units called sectors and in the Kimpese Sector in which the Study Area is located, section chiefs for rural development and for agricultural dissemination are assigned under the supervision of the sector chief who was elected. Both of these section chiefs carry out the development-related tasks following instructions of the sector chief and upper administrative organizations. (Based on the hearing from the sector chief, the population of Kimpese Sector is about 50,000.)

Table 4.1 shown below indicates the number of officials in charge of rural development and agriculture in Bas-Congo Province and in the Study Area and its neighbourhood. Except for those belonging to administrative bodies, several organizations are in action including an international NGO operating with EU funds, Agrisud, a local NGO called CRAFOD operating with funds from Germany's Protestant Christian missions and CLERs carrying out road maintenance programs with participation of villages (54 CLER groups in Bas-Congo Province). Currently, CLER Kiasungua is maintaining and managing the Nkondo route. Cooperation is also provided from AfDB, CTB, EU, FAO, GTZ, JICA, MONUC, UNICEF, UNOPS, etc.

Table 4.1 The number of officials of the Ministry of Agriculture, Rural Development, Fisheries, Animal Husbandry and Small and Medium Enterprise Promotion of Bas-Congo Province

	In charge of Rural Development (Agri, Veterinary and Rural Development)	In charge of Agriculture (Agriculture, Fish rearing)
Bas-Congo Province total	323	-
Cataractes District level	10	19
Mbanza-Ngungu Territory level	15	82
Songololo level	5	31

Source: Based on information obtained from the Ministry of Agriculture, Rural Development, Fisheries, Animal Husbandry and Small and Medium Enterprise Promotion of Bas-Congo Province.

Among the other directorates not listed in the list mentioned above, there are three more directorates which can be considered as the actors of community development in the study area such as follows;

National Service for Cattle Ploughing (SENATRA) : established in 1993 for expanding cultivation areas and increasing in crop yields by cattle ploughing, improving means of transportation by ox traction, and reducing heavy labour. This directorate is disseminating cattle ploughing to small farmers through trainings and technical instructions on cattle ploughing including rearing management of oxen. Apart from dissemination, this directorate also provides testing of cattle ploughing equipment.

National Service for Rural Hydrology (SNHR) : In this directorate, there are hydro-geology engineers and survey engineers who have practical experiences of arrangement of spring water intake facilities, intake facilities of gravity and pumping water, and well installation. In addition, the directorate installed a branch in the Bas Congo province to monitor the water facilities in 2004. At the present day, the financial base of the directorate is weak, and therefore, lack of operational funds and necessary devices, and unsupported new technologies are the major problems of this directorate.

National Service for Cooperatives and Producer Organizations (SNCOOP) : This directorate promotes an active participation for villagers' organizations by residents, and gives advice on creating an organization to them. Moreover, this directorate arranges laws regarding villagers' organizations, manages byelaws of organization, and analyses the effects of activities of villagers' organization.

4.2 Characteristics of the Target Communities

Based on the result of the community profile study (conducted in September 2008 on 415 villagers), the outline of villagers' living conditions in the Study Area is delineated in the Table 4.2 shown below:

Table 4.2 Living Conditions in the Target Villages

	Study Results
(1) Ethnic group	- The largest family is Ndibu with the population of 45% of the total, followed by the Angolan (28.6%) and the Nianga family (14.2%). Other families include Ntandu, Ngombe, Yombe and Zombo, each in a minority.

	Study Results
	- Languages used are Kikongo (93.3%), Lingala (3.5%) and French (2.2%).
(2) Means of Livelihood	- Cash crops produced mainly during the rainy season are cassava, peanuts and maize. Meanwhile, during the dry season, main cash crops are onions, kidney beans and tomatoes in descending order. Approx. 94% of villagers depend on agriculture as their main income source. Besides agriculture, animal husbandry and the sale of wood charcoal are their sources of income.
(3) Living	- 91% of house walls are constructed with bricks. Most of roof is thatched, which accounts for 86.8% of the total (roof thatching material has become difficult to obtain, year after year, because exotic plants arrived there being attached with sacks grow thickly in the Study Area). Following the thatched roof is tin roof accounting for 12.7%. - The number of meals per day is once (6.2%), twice (70.4%) or three times (22.9%) during the dry season. During the rainy season, meals are eaten once (5.5%), twice (69.2%) or three times (25%). For breakfast, lunch and supper, villagers eat fufu, a staple food, with side dishes of vegetable and fish. - Foodstuff and other daily-use articles are bought at markets opening in their own village or nearby villages. The villagers purchase clothes mostly in Kimpese. - Approximately a half of the villagers get up at 6:00 and go to bed at 21:00.
(4) Means of Transportation	- No public means of transportation is in place and most of the villagers travel on foot. Of the total households, 23% have one or more bicycle.
(5) Drinking Water	- In Kimwana where a drinking water treatment facility is in place, villagers have the tap for running water and a sanitary drinking water system is ensured. But, more than a half of the villages in the Study Area do not have a well and use surface water from rivers and streams such as the Lukunga river.
(6) Education	- Among the villagers, 38% are dropouts from elementary school or have never attended a school. Graduates of elementary school account for 14.9% of the total villagers and those graduated from junior high school are 26.9%. Those who can read and write French account for 22%.
(7) Health & Hygiene	- Lavatory is located generally behind the house but only 54% of total households have lavatory. - Major illness found during the past year is malaria (53%) and diarrhea (25%). - Those who went to hospital at least once during the past year are as high as 58%. Due to the lack of means of transportation, most of the villagers travel on foot and approx. 72% had to spend more than 1 hour to get to the clinic. - According to data of the health center in Malanga, of those who visited the center between January and August in 2008, the largest number, 75%, did so seeking treatment of malaria, followed by those who came for respiratory infection (IRA) and diarrhea.

4.2.1 Population

The population of the villages subject to this Study is 9,869 in total, as indicated in Table shown 4.3 below, with the average population per village of about 500. The smallest population is 30 in Mawewe and the largest is 2,500 in Kiasungua. As shown by these figures, the population difference is highly significant. The average size of a household is approx. 5 people. The population distribution is shown in Figure 4.2. In the villages situated along the Nkondo route, agglomerations¹ of Malanga Cité and Kiasungua have a larger population and the combined population of these two villages accounts for around 70% of the total population of the villages along the same route. On the other hand, along the Kilueka route, the combined population of Kilueka Site and Wene accounts for about 50% of the total population living along the route.

A larger number of descents of Angola live along the Kilueka route, particularly in Kilueka Site, Kilueka, Mbanza Ndamba and Wene. Descents of Angola live in almost all of the villages.

¹ Agglomeration is an administrative unit larger than a village. When the population of a village grows and segmentalized sections called quartier form, the village will be called as agglomeration.

Table 4.3 Population and the Number of Households

Village	Population	Descents of Angola	The Number of Households	Village	Population	Descents of Angola	The Number of Households
Kimwana	172	107	44	Malanga Gare	231	-	46
Ndembo	130	25	28	Malanga Cité	1,548	120	258
Wene	628	390	120	Zamba	299	35	78
Ndunguidi	74	-	20	Nkumba	178	5	48
Nkondo	220	37	46	Mawewe	30	-	-
Kinanga	408	120	68	Nkenge	172	39	34
Kisiama	151	16	27	Kiasungua	2,500	-	462
Mbanza Ndamba	494	397	91	Lusasa/Kimpalukidi	287	1	50
Kilueka	455	100	91	Mpete	169	-	-
Kilueka Site	1,385	1,385	230	Nkondo Site	338	333	75
Kilueka route total	4,117	2,577	765	Nkondo route total	5,752	533	1,051
				Total	9,869	3,110	1,816

Note: In this report, descents of Angola do not include those who are Angolese born in Congo.

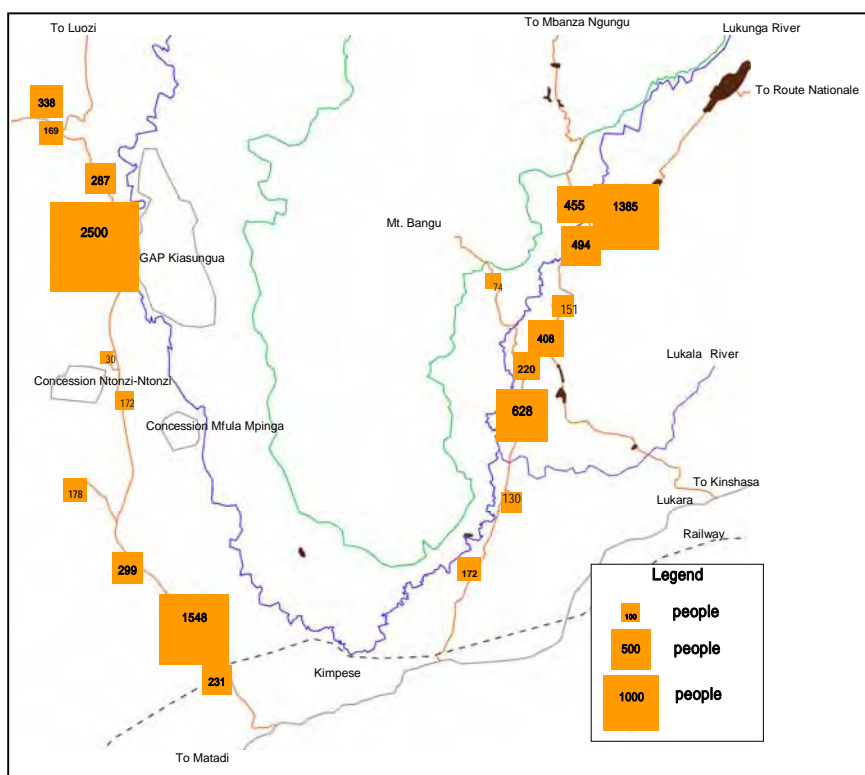


Figure 4.2 Population Distribution

4.2.2 Means of Livelihood

(1) Major Crops

The major industry in the Study Area is agriculture and during the rainy season, cassava and maize are mainly grown, while during the dry season vegetables such as onions and tomatoes are mainly grown. Grains and beans grown during the rainy season are both for personal consumption and sale as cash crops. Vegetables grown during the dry season can be grouped into those grown mainly as

cash crops like onions and others grown for personal consumption such as beans (Haricot) and leaf vegetables (Légumes).

The following tables 4.4 and 4.5 show the major crops grown in each village during the rainy season and the dry season, respectively. No significant difference can be found among the villages.

Table 4.4 Major Crops Grown during the Rainy Season

Village	Major Crops for Personal Consumption			Major Cash Crops		
Kimwana	Arachide	Maïs	Manioc	Tomate	Arachide	Manioc
Ndembo	Manioc	Patate douce	Arachide	Manioc	Arachide	Maïs
Wene	Manioc	Légumes	Haricot	Pois cajan	Petit pois	Arachide
Ndunguidi	Manioc	Arachide	Tomate	Manioc	Arachide	Tomate
Nkondo	Manioc	Pois cajan	Maïs	Manioc	Patate douce	Maïs
Kinanga	Manioc	Arachide	Légumes	Tomate	Piment	Gombo
Kisiamia	Arachide	Maïs	Manioc	Arachide	Maïs	Manioc
Mbanza Ndamba	Manioc	Maïs	Arachide	Maïs	Tomate	Manioc
Kilueka	Manioc	Haricot	Arachide	Manioc	Arachide	Maïs
Kilueka Site	Manioc	Arachide	Maïs	Maïs	Patate douce	Manioc
Malanga Gare	Manioc	Arachide	Haricot	Manioc	Safou	Avocat
Malanga Cité	Arachide	Haricot	Manioc	Tomate	Piment	-
Zamba	Niébé	Patate douce	Maïs	Manioc	Arachide	Tomate
Nkumba	Manioc	Arachide	Patate douce	Manioc	Arachide	Tomate
Nkenge	Arachide	Haricot	Courge	Arachide	Manioc	Haricot
Kiasungua	Manioc	Haricot	-	Manioc	Haricot	Arachide
Lusasa	Haricot	Arachide	Manioc	Arachide	Manioc	-
Kimpalukidi	Manioc	Arachide	Haricot	Manioc	Arachide	Haricot
Mpete	Manioc	Haricot	-	Manioc	Haricot	-
Nkondo Site	Arachide	Maïs	Manioc	Arachide	Maïs	Manioc

Table 4.5 Major Crops Grown during the Dry Season

Village	Major Crops for Personal Consumption			Major Cash Crops		
Kimwana	Manioc	Légumes	Manioc	Oignons	Pois cajan	Légumes
Ndembo	Manioc	Petit pois	Légumes	Oignons	Manioc	Légumes
Wene	Oignons	Petit pois	Haricot	Tomate	Patate douce	Oignons
Ndunguidi	Haricot	-	-	Oignons	Tomate	-
Nkondo	Légumes	Haricot	-	Oignons	Tomate	-
Kinanga	Haricot	Petit pois	Légumes	Oignons	Tomate	Piment
Kisiamia	Haricot	Pois cajan	Légumes	Tomate	Oignons	Piment
Mbanza Ndamba	Haricot	Pois cajan	Manioc	Tomate	Haricot	Oignons
Kilueka	Haricot	Légumes	Tomate	-	-	-
Kilueka Site	Légumes	Manioc	Haricot	Oignons	Manioc	Haricot
Malanga Gare	Légumes	Haricot	Pois cajan	Manioc	Oignons	Autres
Malanga Cité	Tomate	Oignons	Manioc	Tomate	Oignons	Manioc
Zamba	Légumes	-	-	Oignons	Haricot	Tomate
Nkumba	Légumes	Pois cajan	Manioc	Manioc	Arachide	Piment
Nkenge	Légumes	Haricot	-	Légumes	Haricot	Oignons
Kiasungua	Piment	Légumes	Tomate	Oignons	Tomate	Piment
Lusasa	Arachide	Manioc	Tomate	Manioc	Oignons	Légumes
Kimpalukidi	Haricot	Aubergine	Arachide	Haricot	Tomate	Piment
Mpete	Haricot	Légumes	Oignons	Haricot	Légumes	Oignons
Nkondo Site	Oignons	Légumes	-	Oignons	Légumes	-

(2) Cultivation Area

As mentioned above, the grains are grown in the rainy season, while the vegetables are grown in the dry season. The average cultivation area of the rainy season per household where the staple food is grown is 4,678m², which is about three times of that of the dry season, 1,460m², when the cash crops are mainly grown.

(3) Animal Husbandry

As other means of livelihood, animal husbandry (goat, pig and poultry) and wood charcoal production are also carried out in some households. These, however, do not go beyond sideline means of income generation. Almost none of the villagers are full-time workers in business other than farming. The current status of pig husbandry in each village is shown in the following Table 4.6.

Table 4.6 Current Status of Pig Husbandry

		The Number of Pig Raised	The Number of Farm Households engaged in Pig Husbandry
Kilueka route	Kimwana	-	-
	Ndembo	72	9
	Wene	20	10
	Ndunguidi	-	-
	Nkondo	-	10
	Kinanga	-	-
	Kisiamia	12	4
	Mbanza Ndamba	16	3
	Kilueka	63	21
Nkondo route	Kilueka Site	75	15
	Malanga Gare	72	8
	Malanga Cité	50	5
	Zamba	-	-
	Nkumba	22	10
	Mawewe	-	-
	Nkenge	-	5
	Kiasungua	40	8
	Lusasa	35	7
	Kimpalukidi	-	-
Mpete	-	5	
Nkondo Site	15	3	

Source: Community Profile: Responses of Duki (conducted in September 2008). '-' means no response.

(4) Income

The monthly and daily incomes from agriculture per capita in the Study Area are shown below. The other incomes include those from animal husbandry and commercial activities, but approximately 80% of the villagers' income comes from agriculture (78% during the rainy season and 84% during the dry season). Daily income per capita is just less than 1 dollar even if incomes from other than agriculture are included.

Income from agriculture:

Rainy Season	Monthly Income:	Average	\$64.42	(Valid responses: 369)
	Daily Average Income per capita:		\$0.65	(Valid responses: 312)
Dry Season	Monthly Income:	Average	\$82.23	(Valid responses: 335)
	Daily Average Income per capita:		\$0.80	(Valid responses: 315)

Income also including those from other than agriculture:

Rainy Season	Daily Average Income:		\$86.49	(Valid responses: 376)
	Daily Average Income per capita:		\$0.76	(Valid responses: 370)
Dry Season	Daily Average Income:		\$103.55	(Valid responses: 345)
	Daily Average Income per capita:		\$0.93	(Valid responses: 325)

The percentages of villagers who have a daily average income exceeding 1 dollar are shown below. Approx. 30% of villagers obtained daily average income of over 1 dollar (Rainy season: 38%; dry season: 31%).

		The number of Villagers	Percentage
Rainy Season	Less than \$1	216	72%
	Over \$1	82	28%
	Total	298	
Dry Season	Less than \$1	216	69%
	Over \$1	96	31%
	Total	312	

Based on the above data, it is found that the villagers' income needs to increase by around 20% in order to make their daily average income to exceed 1 dollar. To this end, the following measures can be taken both for the rainy and dry seasons:

Income Increase during the Rainy Season

Expansion of cultivation area by exploiting unused land: To expand the cultivation area by cattle ploughing

Increase of unit crop yield through introduction of improved plants: To adopt improved plants (cassava, peanuts)

Income Increase during the Dry Season

Increase of unit crop yield through improvement in cultivation technique: To carry out implantation and mulching, etc.

Increase of added value by selecting time to offer products for sale: To select time to grow (improved seedbed) and introduce storage facilities

Non-agriculture Income Increase

Pig husbandry, poultry husbandry, aquaculture, beekeeping, etc.

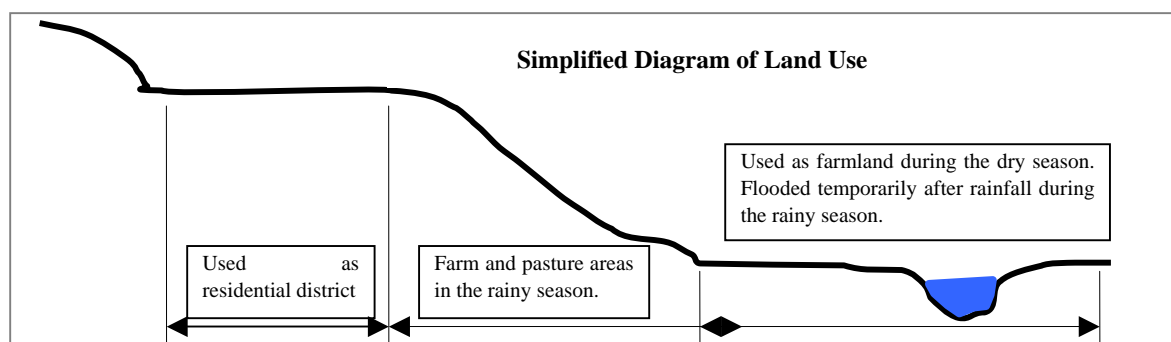
4.2.3 Land Use

In the Study Area, land at lower altitudes is generally used as farmland as shown below. Land at relatively higher altitude is used as residential districts.

In lowland near rivers, vegetables are grown actively during the dry season (photo on the right) using a bucket irrigation system. During the rainy season, however, lowland will be flooded over temporarily when there is heavy rain fall and it is not suitable for vegetable farming. And therefore, maize and sugarcane are grown during the rainy season.



The main crops of the rainy season including cassava and peanuts are widely grown in areas where no flood occurs even during the rainy season, except for lowland near rivers.



In the Study Area, the annual average temperature is around 25 °C, and due to the climatic conditions, the crops can be cultivated three times in a year. As shown in the above diagram, however, the land is used differently depending on the altitude. Cassava, which is a staple food, and peanuts are grown in the rainy season and cash crops such as vegetables are grown in the dry season. The cultivation calendar of the areas is shown in the following Fig. 4.3.

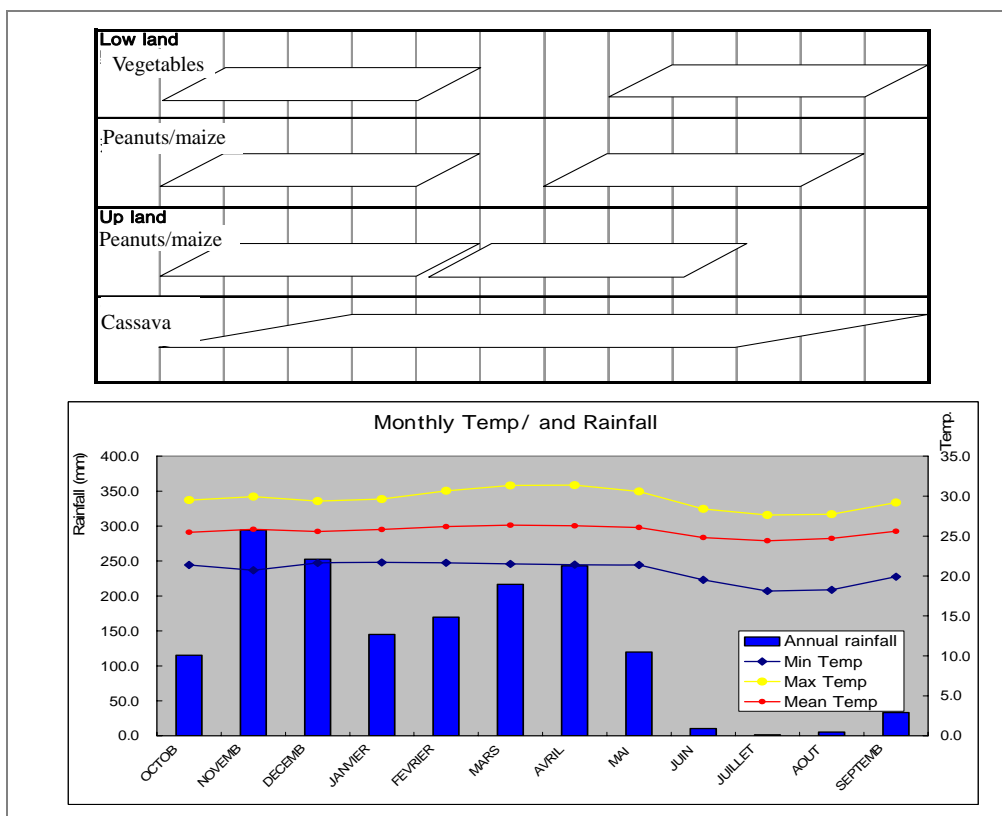


Fig. 4.3 Cultivation Calendar

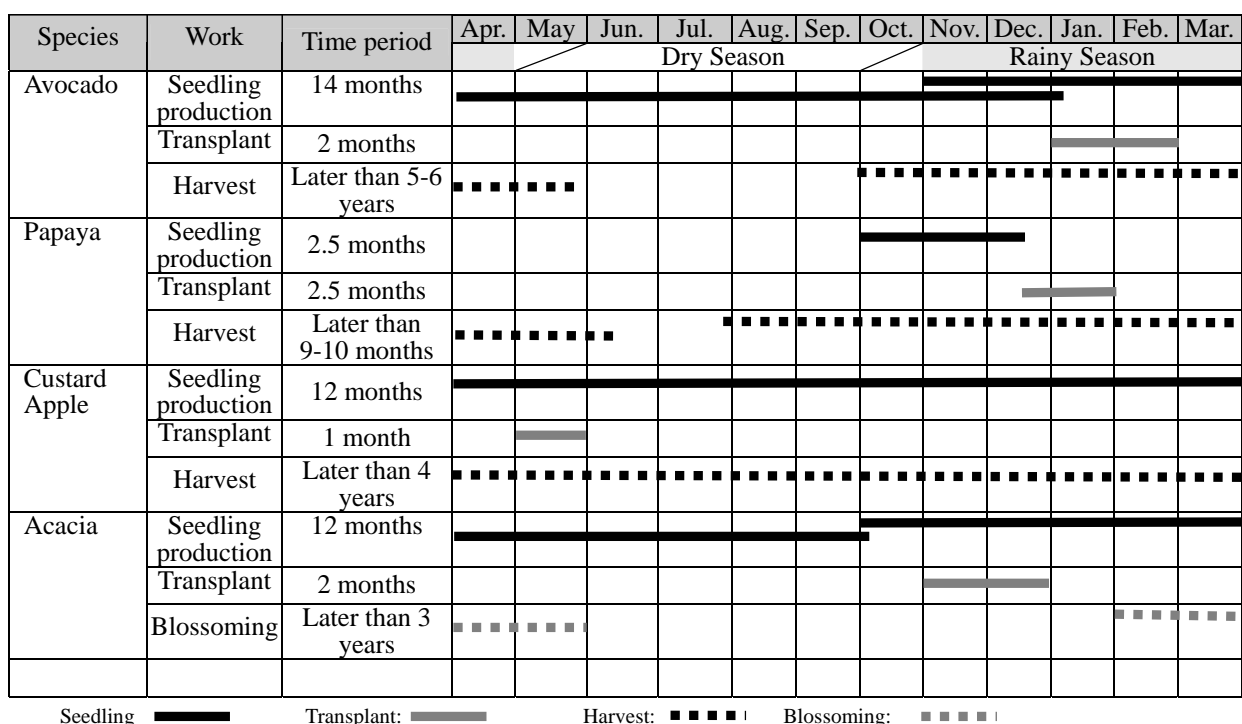
(The minimum, maximum and mean temperatures shown in Fig. 4.3 are averages of temperatures measured at 6:00 a.m., 3:00 p.m. and 6:00 p.m., respectively.)

In Bas-Congo Province, useful tree species are also widely grown, particularly fruit trees. The replantation schedule for each tree species is shown in the following Table 4.7. In this province, fruit trees including citrus like orange, safu², mango, avocado and papaya are grown. When replantation and preservation programs were carried out, many acacia trees were planted in the province, too.

Table 4.7 Replantation Schedule

Species	Work	Time period	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
			Dry Season						Rainy Season					
Citrus	Seedling production	18 months	■											
	Transplant	2 months									■	■		
	Harvest	5-6years later	■	■	■	■	■	■	■					
Safu	Seedling production	9 months	■											
	Transplant	2 months									■	■		
	Harvest	Later than 6 years	■	■	■	■	■						■	■
Mango	Seedling production	18 months									■	■	■	■
	Transplant	1.5 months	■	■										
	Harvest	Later than 5 years						■	■	■	■	■	■	■

²Safe is a fruit grown in central western Africa. When it matures, its red outer skin turns into black and sour and custard cream-like taste fruit is produced.



4.2.4 Land Ownership

In the Study Area, under the customary law, the ownership of land belongs to clans³. In principle, land is not offered for sale and clan members called Mfunmu a ntoto inherit the land from generation to generation. Although clan members who live in a distant area away from their original village have no right to the land of the village, they regain the right when they come back to the original village. The difference between other villagers who only maintain the usufructuary right to the land and Mfumu a ntoto is that the latter can receive income from land leasing and has the right to make their relatives to inherit the ownership right to the land.

Clan members have the right to become Mfumu a ntoto, regardless of genders. The Study Area, however, is characterized by the form of society represented by the matrilineal and virilocal marriage; and therefore, it is not easy for clan members who are inheritors of the land to continue to live in the village where they were born. In other words, if a female villager gets married to a man of other village, she will go out of her village and in her husband's village will have a child who has the right to inherit the land of her home village. Meanwhile, a man can have a child in his own village, but the child belongs to a different clan. As a result, the land owned by a man, in general, will be inherited not by his own child belonging to a different clan but his sister or her child belonging to his own clan.

Land is managed by the oldest member of the clan, or clan head (Mfumu a nsanda/Mfumu a dikanda), and even a clan member who is Mfumu a ntoto cannot put the land to lease without

³ People share a sense of connection through recognition that they have common ancestors. Generally, people's identification is determined by tracking back paternal or maternal origin. In 3.1.2 (2) "Traditional Land Ownership" in this report, it is explained that the right to land management belongs to the lineage, but the word "clan" is used in this section, since it is considered that in the study area villagers are not necessarily aware of their own identification based on their lineage.

obtaining consent of the clan head. When the clan head is dead or unable to fulfil his role because of old age, the next oldest clan member living in the same village or nearby village will become the new clan head. If no clan member lives in the same or nearby village, a male clan member who works away from the village or lives in a faraway village or a male child of a female clan member who went out to get married will apparently immigrate into the original village to become the succeeding clan head.

In principle, it is said that one clan head exists in one clan but we found many exceptions (see Table 4.8 below). When a member of a clan immigrates into the land owned by the same clan and a part of the clan land is given to her/him to form a new village, in many cases both of the villages will have one clan head, respectively. On the other hand, when an affiliated (child) village is formed on a land broken up from an original (parent) village, there is often one clan head in the clan. For example, of Nkondo, Kinanga and Kisiana, all belonging to the Nanga clan along the Kilueka route, Nkondo is a village formed by the son, Duki, of the clan head living in Kinanga a little away from it and the two villages have only one clan head. On the other hand, Kisiana is a village formed by those who were given a part of Kinanga and immigrated into it since they are members of the same clan, they already had a land in other place and had lived there. As the result, Kisiana has its own clan head separately from the one managing both Nkondo and Kinanga.

As mentioned above, land in the Study Area is in principle not bought and sold. But in spite of the fact that the clan head's consent must be obtained for land lease or sale, we noticed that disputes occurred between villages about land sale carried out without consulting the clan head. Also in these cases, there often are more than one clan head in one clan.

Table 4.8 Villages and Clans in the Study Area

Village	Clan	Remarks
Kimwana	Mfutila	Land is commonly owned.
Ndembo	Mfutila	Clan head lives in Ndembo.
Wene	Ntambu	Clan head lives in the village.
Ndunguidi	Ntumba, Mpanzu	Clan head lives in the village.
Nkondo	Nanga	Land is commonly owned.
Kinanga	Nanga, NKazia Nkongo	Clan head lives in Kinanga.
Kisiana	Nanga	Clan head lives in the village.
Mbanza Ndamba	Nsaku	Land is commonly owned.
Kilueka	Nsaku	Clan head lives in Kilueka.
Malanga Gare	Nsaku	
Malanga Cité	Nanga	Land is commonly owned.
Zamba	Nanga	Clan head lives in Zamba.
Nkunba	Nsaku	Land is commonly owned.
Mawewe	Nsaku	Clan head lives in Nkumba.
Nkenge	Nsaku	
Kiasungua	Nanga, NKazia Nkongo, Mfutila	Land is commonly owned including the village of Nsumba (Nkazia Nkongo clan). Clan head lives in Zamba.
Lusasa	Mfutila	Clan head lives in the village.
Kimpalukidi	Mfutila	Land is commonly owned including the village of Kokodia. Clan head lives in the village.
Mpete	Mfutila	Clan head lives in the village.

Source: Records of hearing studies ((a), 2009).

In the Study Area, there also are child villages or grandchild villages derived from their parent villages. Each of such parent villages has its clan head who has the right to ownership of land of all the relevant villages including child and grandchild villages. The child villages and grandchild villages are formed by some families belonging to the same clan of the parent village who left the parent village and moved to other land for the reason of population increase, etc. Grandchild villages are those derived from child villages. For example, along the Kilueka route in the Study Area, Kinanga is the parent village and Nkondo and Kisiama are its child villages. Along the Nkondo route, Nkumba is the parent village and Nkenge is its child village and Mawewe is its grandchild village. Since there is no clan head in child and grandchild villages, if any land dispute occurs, villagers will visit and consult the clan head living in the parent village.

4.2.5 Water Use

As shown in the section on land use above, rivers running through lowland are used as a water source during the dry season. In the Study Area, water of the Lukunga river or springs in Kimwana never dries up even during the dry season and water from the river and springs is used not only for farming but also for daily life in all the villages of the Study Area.

In the Study Area, water source for village water supply use is from the Lukunga river and others such as wells, springs and streams. The sources of water for drinking and miscellaneous use and the result of water quality test are shown in Tables below.

Of the 21 villages, although 6 villages already have wells and 4 villages have hand pump wells, remaining villages have only draw wells. Specifically, hand pump wells are in place in Kinanga and Kilueka Site along the Kilueka route and Malanga Gare and Kiasungua along the Nkondo route, while draw wells are in place in Malanga Gare and Nikondo Site along the Nkondo route. In July 2008 when this Study began, all of these hand pumps were working well but the one in Kiasungua was not used because water pumped from the well smelled like iron. Later, the hand pumps stopped working in Malanga Cité in around November 2008, in Kinanga in February 2009 and in Kilueka Site in July 2009, respectively. Under the support of the Kimpese Sector of the Ministry of Health of Congo, procurement of spare parts needed for repair has been underway, but necessary parts have not been found even in Kinshasa.

There are 5 villages where springs are used as a water resource supplying relatively good quality water in addition to wells. They are Ndembo and Nduguidi along the Kilueka route and Zamba, Lusasa and Mpete along the Nkondo route. The other villages use water from the Lukunga and small streams.

As seen in the result of water quality test, coli bacteria is observed in most of the water sources. All of the wells in the Study Area are shallow wells and chlorine is regularly used for sterilization. The disinfectant is obtained free of charge through the Kimpese Zone of the Ministry of Health, but sterilization is often delayed due to a lack of chemical inventory.

Table 4.9 Result of Water Quality Test: Kilueka Route


Kimpese - Nkondo Site	WHO Standard	3	3	4	5	6	6	7	7	11	12	13
		Ndembo A spring, which was reportedly used in the past	Ndembo Water from the three pipes installed by CRAFOD	Wene The Lukunga River	Nkondo The Lukunga River	Ndungidi A place where water from a mountain top springs out	Ndungidi Water at the top of a mountain	Kinanga An India Mark II pump installed by Ime in 1996	Kinanga The Lukunga River	Kisiamia The Lukunga River	Mbanza-Ndamba The Lukunga River	Kulueka Site The only well used for drinking water among the eight currently in use among the 16 in existence at the site
Sampling date	0.2 or less	(Fri.), September 20th, 2008	(Fri.), September 20th, 2008	(Thu.), September 18th, 2008	(Fri.), September 19th, 2008	(Fri.), September 20th, 2008	(Fri.), September 20th, 2008	(Fri.), September 19th, 2008	(Fri.), September 19th, 2008	(Fri.), September 19th, 2008	(Thu.), September 18th, 2008	(Wed.), September 17th, 2008
GPS	0.3 or less	0.5°31' 02S 014°26' 45E 305m	0.5°30' 58S 014°26' 45E 306m	0.5°25' 04S 014°28' 29E 340m	0.5°28' 15S 014°27' 02E 325m	0.5°26' 24S 014°26' 17E 325m	0.5°26' 24S 014°26' 17E 325m	0.5°27' 58S 014°27' 45E 248m	0.5°27' 07S 014°27' 22E 331m	0.5°25' 41S 014°27' 37E 340m	0.5°25' 19S 014°28' 29E 295m	0.5°32' 97S 014°20' 52E
pH	0.3 or less	7.8	7.5	8.5	8.7	8.5	8.1	6.3	8.5	8.7	8.5	6.1
EC	0.4 or less	0.42mS/cm	0.41mS/cm	0.25mS/cm	0.22mS/cm	0.32mS/cm	109µS/cm	69µS/cm	0.22mS/cm	0.23mS/cm	0.20mS/cm	28µS/cm
Fluorine (mgF/L)	1.5	0	0	0	0	0	0	0	0	0	0	0
Nitrate nitrogen (mgNO ₃ ⁻ /L)	11.6	0.5	0.2 or less	0	0	0.2	0.2 or less	-	0	0	0	0
Nitrate ion (mgNO ₃ ⁻ /L)	50	2.2	0.87 or less	0	0	0.87	0.87 or less	-	0	0	0	0
Nitrite nitrogen (mgNO ₂ ⁻ /L)	1 (short-term exposure of infants) 0.1 (long-term exposure)	0	0	0	0	0.005	0	0	0	0	0	0
Nitrite ion (mgNO ₂ ⁻ /L)	3 (short-term exposure of infants) 0.2 (long-term exposure)	0	0	0	0	0.017	0	0	0	0	0	0
Total Hardness (mgCaCO ₃ /L)	0.4 or less	-	-	-	-	-	-	0	-	-	-	0
phosphate-phosphorus (mgPO ₄ ³⁻ /L)	0.5 or less	0.1	0.05	0.05	0.05	0.1	0.02	-	0.05	0.05	0.1	-
phosphate ion (mgPO ₄ ³⁻ /L)	0.6 or less	0.3	0.15	0.15	0.15	0.3	0.06	-	0.15	0.15	0.3	-
Iron (mgFe/L)	0.7 or less	-	-	-	-	-	-	2 or more	-	-	-	0
Total coliform (MPN/L)	0	0	0	3	5	3	-	3	0	0	many	0
												
COD(mgO/L)(ppm)	0.7 or less	2	0	4	6	6	8 or more	5	8 or more	8 or more	8 or more	0
Ammonium nitrogen (mgNH ₄ ⁺ /L)	1.15	0.2 or less	0.2 or less	0.2	0.2	0.5	0.2	-	0.2	0.2	0.2	0.2
Ammonium ion (mgNH ₄ ⁺ /L)	1.5	0.25 or less	0.25 or less	0.25	0.25	0.64	0.25	-	0.25	0.25	0.25	-

Table 4.9 Result of Water Quality Test: Nkondo Route

Kimpese - Nkondo Site	WHO Standard	1	2	3	4	5	6	7	7	7	8	9	10
		Malanga Gare A well developed by a hospital in Kimpese located at the end of a small alley on the right side of the old road, which was used before the construction of CRB beyond the railway line	Malanga Cite/Malanga ICB A well in constant use equipped with an India Mark II	Zamba I Water from a pipe The well on the side was used in the past	Nkumba The Nkonge River	Nkonge The lower reaches of the Nkonge River, close to the confluence with the Lukunga River Water a stagnant.	Mawewe Water dries up in the dry seasons	Kiasungua Spring water gushing out between stones (the first place to be taken to)	Kiasungua A well equipped with a hand pump, near GAP	Kiasungua The Lukunga River, heavy human traffic	Lusasa/Kimpalukudi Reservoir (for drinking water) surrounded by trees, white turbid water a green snake near the sampling site	Mpete Water running over red stone beside a ca. 5m-deep spring water reservoir	Nkondo Site Draw well
Sampling date	-	(Fri.), September 12th, 2008	(Fri.), September 12th, 2008	(Thu.), September 11th, 2008	(Thu.), September 11th, 2008	(Thu.), September 11th, 2008	(Thu.), September 11th, 2008	(Wed.), September 10th, 2008	(Wed.), September 10th, 2008	(Wed.), September 10th, 2008	(Tue.), September 9th, 2008	(Wed.), September 9th, 2008	(Fri.), September 12th, 2008
GPS	-	0.5°32' 47S 014°20' 52E 295m	0.5°31' 31S 014°18' 16E 298m	0.5°30' 31S 014°17' 16E	0.5°30' 55S 014°18' 35E 298m	0.5°25' 44S 014°19' 48E 304m	0.5°25' 44S 014°19' 48E 304m	0.5°33' 35S 014°27' 09E	0.5°25' 13S 014°19' 02E	0.5°25' 45S 014°19' 41E	-	0.5°33' 35S 014°27' 09E	0.5°30' 31S 014°19' 16E 298m
pH	-	7.0	5.9	6.1	7.0	7.1	6.6	7.7	7.2	9.0	8.2	7.7	6.5
EC	-	138µS/cm	17µS/cm	0.26µS/cm	0.35µS/cm	0.45µS/cm	0.17µS/cm	0.34mS/cm	0.24mS/cm	0.34mS/cm	0.33mS/cm	0.33mS/cm	93µS/cm
Fluorine (mgF/L)	1.5	0	0	-	0	0	0	0	0.5	0	0	0	0
Nitrate nitrogen (mgNO ₃ ⁻ /L)	11.6	0	-	-	0.2 or less	0.2 or less	0.2 or less	-	-	0.2 or less	0.2 or less	0.2 or less	-
Nitrate ion (mgNO ₃ ⁻ /L)	50	0	-	-	0.87 or less	0.87 or less	0.87 or less	-	-	0.87 or less	0.87 or less	0.87 or less	-
Nitrite nitrogen (mgNO ₂ ⁻ /L)	1 (short-term exposure of infants) 0.1 (long-term exposure)	0	0	-	0.005 or less	0.005 or less	0.005 or less	-	0.005 or less	0.005 or less	0.005 or less	0.005 or less	0
Nitrite ion (mgNO ₂ ⁻ /L)	3 (short-term exposure of infants) 0.2 (long-term exposure)	0	0	-	0.017 or less	0.017 or less	0.017 or less	-	0.017 or less	0.017 or less	0.017 or less	0.017 or less	0
Total Hardness (mgCaCO ₃ /L)	-	-	0	-	-	-	-	0	-	-	-	-	20
phosphate-phosphorus (mgPO ₄ ³⁻ /L)	-	-	-	-	0.02	0.02	0.02	-	-	0.05	0.1	0.05	-
phosphate ion (mgPO ₄ ³⁻ /L)	-	-	-	-	0.06	0.06	0.06	-	-	0.15	0.3	0.15	-
Iron (mgFe/L)	-	-	0.1	-	-	-	-	-	1	-	-	-	0.005 or less
Total coliform (MPN/L)	0	5	13	4	6	7	7	-	-	-	-	-	5
													
COD(mgO/L)(ppm)	-	2	0	-	6	8 or more	2	-	10	1	4	1	3
Ammonium nitrogen (mgNH ₄ ⁺ /L)	1.15	0.2	-	-	0.2	0.2	0.2	-	-	0.5	0.5	0.2	-
Ammonium ion (mgNH ₄ ⁺ /L)	1.5	0.25	-	-	0.25	0.25	0.25	-	-	0.64	0.64	0.25	-

4.2.6 Markets and Public Facilities (Schools and Medical Facilities)

In some villages, regular markets for items of daily use are available and public facilities such as elementary and junior high schools and medical facilities are in place. The list of these facilities in each village is given as Table 4.10 below.



The markets and public facilities are commonly used by several villages, and those who live in distant villages have difficulties in accessing these facilities. Although it is not only caused by poor accessibility, it was found that in elementary and junior high schools in the Study Area many children dropped out or repeated the same grade since they were unable to advance to the next grade. The proportion of dropout children on an average is 42% at elementary school and 47% at junior high school (Année Scolaire 2006 - 2007).

Table 4.10 Availability and Size of Markets and Public Facilities

Village	Market		Elementary School		Junior High School		Medical Facility ¹⁾		Distance to Schools	Distance to Medical Facility
	Day of the week		The number of classrooms		The number of classrooms					
Kimwana									4km	4km
Ndembo									7km	7km
Wene	o	Sunday	o	6					0km/ 9km	4km
Ndunguidi									7km/ 12km	7km
Nkondo									3km/ 8km	3km
Kinanga ²⁾			o	8			o	Health Centre	2km/ 9km	2km
Kisiama									3km/ 11km	3km
Mbanza Ndamba	o		o	6					-	1km
Kilueka	o	Wednesday					o	Health Centre	1km	-
Kilueka Site			o	12	o	12			-	1km
KILUEKA Route Total	2		4		1		2			
Malanga gare									2km	2km
Malanga Cité	o		o	16	o	12	o	Health Centre	-	-
Zamba			o	2 ³⁾					3km	3km
Nkumba									12km	7km
Mawewe									4km	4km
Nkenge									6km	6km
Kiasungua	o	Saturday	o	12	o	6	o	Health Centre	-	-
Lusasa									5km	5km
Kimpalukidi									2km	2km
Mpete			o	6	o	1			-/ 5km	1km
Nkondo Site							o	Health Post	1km/ 6km	-
NKONDO Route Total	1		3		3		3			
Grand total	3		7		4		5			

Note: ¹⁾ Medical facilities in the Study Area are Post de sante or Centre de sante.

²⁾ In Kinanga, an elementary school and a medical facility are in place in small villages of Mbinda and Betelemi, respectively.

³⁾ The elementary school in Zamba accommodates only 1st and 2nd grade children.

The location of markets and public facilities and the movement of villagers who use such

facilities are shown in Figure 4.4, which reveals poor accessibility to social infrastructure in this area. For example, the distance from Nkumba to Malanga Cité is about 7km and villagers have to come and go between school or hospital on foot because of lack of means of transportation. The children living in Nkumba spend more than 90 minutes to get to their school.

There is a plan to construct collective collection and shipping center in Kiasungua along the Nkondo route and in Nkondo and Ndunguidi along the Kilueka route. In September 2009, the construction of one of such centre in Nkondo was completed.

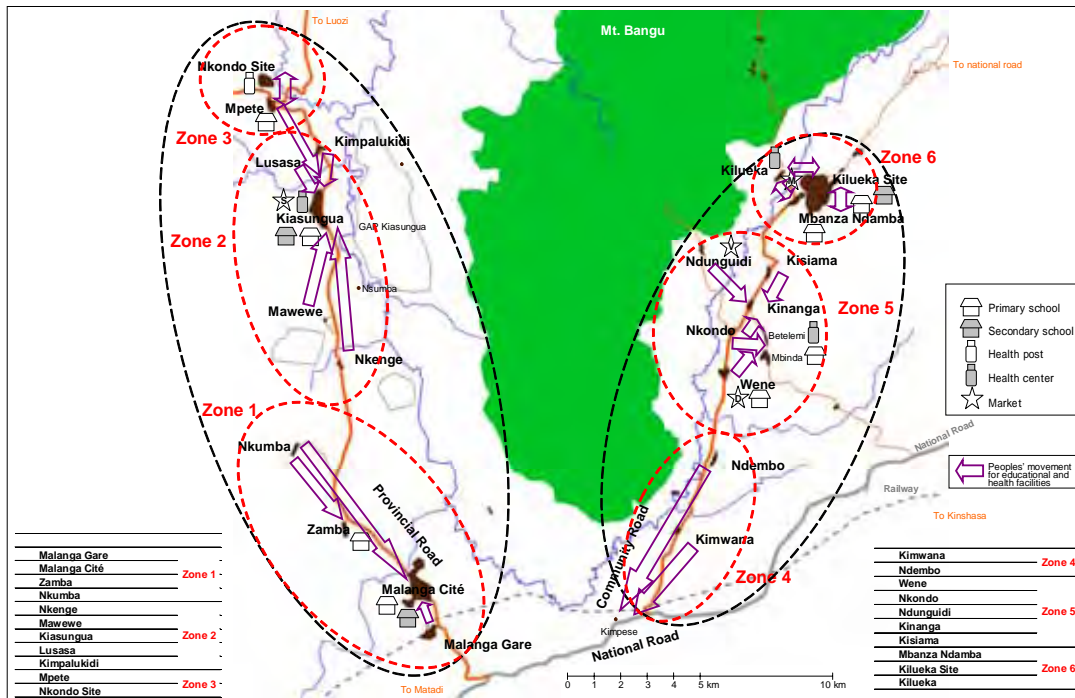


Figure 4.4 Flow of Villagers Using Markets and Public Facilities

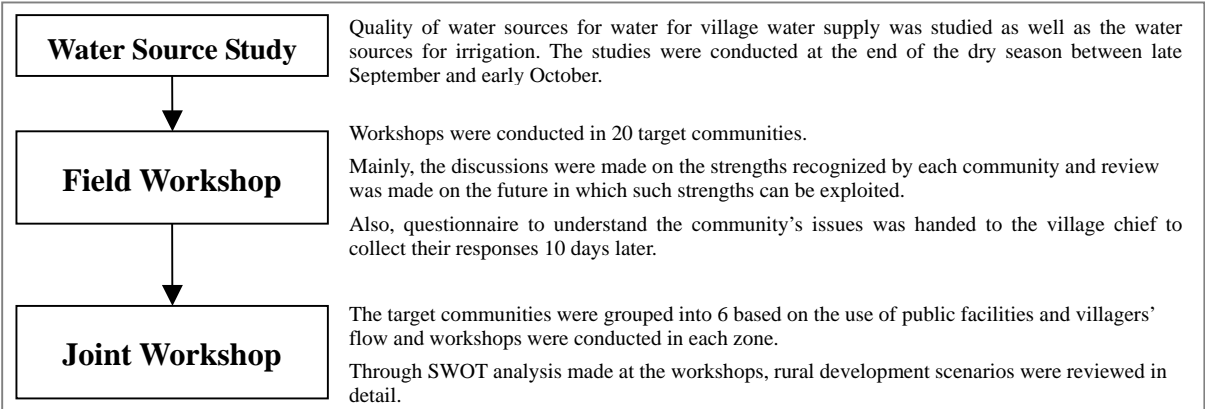
As described above, the population distribution varies between 21 villages subject to this study and it is difficult to ensure the same level of good accessibility to public services and markets for all these villages. It is necessary, therefore, to divide these villages into groups taking into account of the flow of villagers going and coming between other villages and to review the direction of rural development making such division as one of development factor. Hence, it was proposed to divide the Study Area into 6 zones as shown in Figure 4.4, in view of the flow of people and access to public services, etc. Since, in the Zone 4, Kimwana and Ndembo are located close to Kimpese, residents of the two villages use the market and school in Kimpese. In this way, it is proposed to divide the area into 6 zones taking into account of the access to public services, but when focusing on each village's clan, it can be seen that users of public services and the clan are overlapping along the Kilueka route.

4.2.7 Existing Villagers’ Organizations

In each village of the Study Area, there already is a village development committee. A village development committee is composed of a representative (Duki), a deputy representative, a secretary and an accountant to promote village development. The village development committees hold a general assembly meeting several times a year and encourage all the villagers to participate as well as determine the direction of village development in accordance with laws and conventions. In addition, each village development committee has several sub-organizations for managing diverse factors including education, health and hygiene, water and animal husbandry and for each of these areas, under the supervision of such an organization, a villagers’ organization is formed. In general, the 4 villagers’ organizations for education, health and hygiene, water and animal husbandry operate intertwined with the activities of administrative bodies (see Annex 4.1) but the background and the administrative bodies in charge are different depending on areas. In the education area, National Association of Parents of Students in Democratic Republic of the Congo (ANAPECO) is the competent authority and a villagers’ organization, Committee of Parents (COPA), is formed. COPA is responsible for assigning a contact person for a child who reaches an age to attend school in the village and for negotiating the school fee and other matters with the school for the child. In the area of health and hygiene, each health zone acts as the regulating body to respond to issues concerning health, hygiene, water, diseases, injuries, etc. In the area of animal husbandry, an administrative structure such as sector or territory acts as the competent authority to collect taxes from animal husbandry income and control livestock diseases.

4.3 Study Area’s Issues and Needs

In order to clearly understand the issues and needs of the target communities, water source quality studies, a field workshop in each village and a joint workshop in each zone were conducted. The result of water source studies is as described above.



4.3.1 Field Workshop

(1) Strengths of Villages

Field workshops were conducted focusing on the “strengths of the village,” “slogans” and “catch phrases of the village.” The result of the field workshops is shown in Table 4.12 below.



As shown in Table 4.12, the villagers of many villages mentioned that the fertile soil is their strength in the area of agriculture. In addition, villagers also consider that fruit trees and animal husbandry (goats, poultry, etc.) are important.

In relation to the living environment, most of the villages understand the fact that roads in place is one of the strengths. Rivers such as the Lukunga and its tributary streams do not dry up throughout the year, which is recognized as a valuable water source. Villagers consider football is their major past time activity. And in 15 villages, there is a football team, which they consider as strength.

Concerning the public services including healthcare and education, about a half of the villages consider it as strength that such services are within their village or within accessible distance.

Finally, 17 villages consider it as a strength that the villagers cooperate with each other and join together.

Table 4.11 Strength of the Villages

Strength (current)			Strength (future)		
		Total		Total	
1. Agriculture	(1) Agricultural production	Have fertile soil.	16	To mechanize farming	14
		Transportation of farm products is possible. Distribution and sale are possible.	11	To expand cultivated land through the use of cattle ploughing	1
		Have a vast extent of land.	6		
		Have high agricultural yields.	2		
		Farm field is located nearby.	1		
	(2) Tools and equipment	Have farming tools.	1	To introduce improved seeds and farming tools	9
				To improve soil	
				To reproduce seeds and develop seed production field	1
	(3) Cultivation	Cultivation for each season has been conducted.	10	To improve cultivation conditions for onions	1
		Have improved manioc.	3	To carry out more intensive rice cultivation	1
		Staple food can be produced.	2		
		Onions are produced.	2		
Peanuts are produced.		1			
	Sugarcane production is conducted.	1			
(4) Fruit tree	Have fruit trees planted.	16	To expand fruit orchard and graft fruit trees	3	
	Windbreak forests are in place.	10	To carry out replantation	2	

Strength (current)			Strength (future)		
		Total		Total	
	There are forests.	5			
	Wood charcoal can be produced.	3			
(5) Animal husbandry, fisheries, etc.	Animal husbandry is carried out.	18	To expand animal husbandry To improve poultry and aquaculture	5	
	Fisheries are possible.	3			
	Hunting is possible.	2			
	Have one or more animal husbandry and cultivation-specialized technicians.	1			
	Have feed crops.	1			
	Aquaculture is conducted.	1			
	Have one or more persons who can conduct beekeeping.	1			
	Improved species (poultry) are available.	1			
	No registration is required for animal husbandry.	1			
(6) Farm product processing	Sugarcane wine can be produced.	5	To process peanuts, tomatoes, palm oil, etc.	4	
	Date palm oil can be produced.	3			
	Peanut oil can be produced.	1			
	Soap can be produced.	1			
	Sugarcane juice is available.	1			
(7) Technical assistance	Agricultural advice can be given.	4	To have training on vegetable cultivation, beekeeping and animal husbandry	4	
(8) Others	The village is a place for exchange for offering products from Bangu for sale.	1			
2. Living	(1) Water for village water supply	Have rivers.	9	To ensure drinking water and improve water quality	5
		Drinking water is available.	4		
		Water is available throughout the year.	3		
		Wells are in place.	2		
	(2) Clothing, food and housing	Thatch for roof is available.	2	To improve housing	1
		Quality of housing is good.	1		
	(3) General	Have roads.	18	To develop and improve roads, electricity supply and hospitals	4
		Telephone communication is possible.	7	To improve and rehabilitate bridges	1
		TV and video data can be watched.	5	To improve cooking stoves for women	1
		Land is flat.	4	To keep peace	1
		Station is located nearby.	2		
		Peace and safe.	2		
		Radio can be listened to.	2		
		Road crossings are in place.	1		
		Electricity can be easily supplied.	1		
		Electric appliance is available.	1		
		Video data can be watched.	1		
	Climate is good (cool).	1			
(4) Store, etc.	Have one or more crafts workers.	9	To conduct manioc processing (flour milling machines)	1	
	Have one ore more markets.	5			
	Have one or more boutiques.	3			

Strength (current)			Strength (future)	
		Total		Total
		Have one or more blacksmiths.	2	
		Have one or more repairmen.	2	
		Have one or more hairdressers.	2	
		Have one or more manioc flour milling machines.	1	
		Have one or more bakeries.	1	
		Have one or more pastry cooks.	1	
	(5) Others	Have pastime opportunities and sport teams (football team).	15	
		Have one or more musical groups.	3	
		Have one or more tourist destinations. (VAMPA).	1	
		Have one or more lodging facilities.	1	
		Have one or more caves.	1	
		Lightening strikes regularly the same places.	1	
		Have one or more administrative branch offices.	1	
3. Healthcare	(1) Diseases	No epidemic infection exists.	3	
		Sleeping sickness is under control.	2	
		No diseases caused by existing water.	1	
	(2) Medical facilities	Have one or more health centers nearby.	9	To develop health centers 4
		Preventive vaccination for children is regularly conducted.	7	To increase medical drugs 1
		Have one or more health centers.	4	
		Have one or more pharmacists.	4	
		Have one or more health posts nearby.	2	
		Have one or more hospitals nearby.	1	
		Have one or more measures to transport patients.	1	
		Educational activities are conducted.	1	
	(3) Medical drugs	Medicinal plants are available.	2	
	(4) Others	Bicycles can be used as an emergency vehicle.	1	
		There is a Red Cross committee.	1	
4. Education	(1) Educational facilities	Have one or more schools nearby.	9	To rehabilitate school 2
		Have one or more schools.	8	To improve children's rate of school enrollment 2
		Children of the village attend school.	4	To establish elementary school for lower graders (children of 1st or 2nd grade) 1
	(2) Others	Have one or more teachers.	1	To offer literacy education and training for technique acquisition (sewing) 2
5. Villagers' Organization		Mutual aid, cooperation and cohesion are in place.	17	To organize farmers' organizations, to train the youth and to increase income 4
		Have one or more farmers' organizations.	8	
		Have one or more groups for women's mutual cooperation.	6	
		Have one ore more groups for the youth mutual cooperation.	6	
		Village development activities are in place.	1	

(2) Issues and their countermeasures

The issues listed by each village and their countermeasures are shown in Table 4.12. The half-tone dotted sections of Table 4.12 represent issues and countermeasures listed commonly by 5 or more villages.

In the area of agriculture, the issues listed include lack of seeds and tools. It was revealed that the villagers cannot purchase improved cassava seeds, sufficient amount of basic farming tools, and equipment. According to the National Institute of Agronomic Studies and Research (INERA), with improved cassava varieties, multiplication of cassava production and shortening of cultivation period are targeted and approximately 2 to 3 times of yields will be possible compared to those of native varieties, and it will take 9 months to about 1 year to produce cassava. Meanwhile, the cultivated field is limited since the works are done manually and the total cultivated area cannot be increased through mechanization, which is another issue. In the entire Study Area, poorly developed public facilities such as schools and health centers are issues commonly recognized by the villagers.

Similarly, the countermeasures to these issues indicated by 6 or more villages are shown in the half-tone dotted sections in Table 4.12. The countermeasures are grouped into the following three categories: 1) Agriculture (availability of farming tools and equipment); 2) Living (ensuring of drinking water); and 3) Public service facilities (rehabilitation of health facilities and schools).

Table 4.12 Villages' Issues and Their Countermeasures

Issue				Countermeasures (needs)	
			Total		Total
1. Agriculture	(1) Agricultural production	Cultivated area is limited because of manual work.	7	To mechanize agriculture	8
		Have no sufficient cultivated field.	4	To use cattle ploughing	4
		Lowland is often flooded with water.	1	To purchase engine pumps	2
		The soil is not fertile.	1	To obtain fertile soil	1
				To improve soil	1
				To rehabilitate bridges to farmland	1
	(2) Tools and equipment	Seeds in good quality are insufficient.	13	To obtain farming tools	15
		Farming tools are insufficient.	12	To obtain seeds	15
		Improved cassava is insufficient.	10	To obtain seedlings of improved cassava	6
		Seeds are expensive to purchase.	3	To develop orchards	1
		Agricultural chemicals are unavailable.	3		
		Have no fruit tree seedlings.	2		
		Have no ration for livestock.	1		
	(3) Animal husbandry	Livestock get sick.	2	To reproduce livestock	3
Do not know how to treat livestock's illness.		2	Disease and insect damage prevention measures are needed.	2	
Materials to build stables are insufficient.		2	To obtain materials for stables	2	
Have no good livestock.		1			

Issue				Countermeasures (needs)	
			Total		Total
	(4) Technical assistance	Technical support and guidance is not available.	3	To receive agricultural training	2
				To receive beekeeping training	2
				To follow the cultivation calendar	1
	(5) Organizations			To establish farmers' organizations	1
				To manage products	1
				To diversify products	1
(6) Others	Bridges to farmland are broken. Beekeeping is insufficient.	2	To find ways to sell products in Kinshasa	1	
		1			
2. Living	(1) Drinking water	The quality of drinking water is poor. Drinking water is insufficient. Do not have pumps to obtain drinking water.	9	To ensure drinking water	5
			3	To rehabilitate wells and install pumps	5
			2	To improve water sources	2
	(2) Clothing and food	Food is insufficient. Clothing is insufficient.	5		
			1		
	(3) Housing	Houses and roof materials are poor in quality. Living standard is low. Electricity is unavailable.	6	To rehabilitate houses	4
			1	To install necessary furniture	2
			1		
	(4) General	Flour milling work is exhausting. Road conditions are poor. Do not have retail stores in the village. There are no jobs in the village. There is no means of transportation. The market does not open frequently. Many people come to the village to work from outside. Do not have savings. Credit is not available.	6	To repair roads	6
			5	To install flour milling machines	4
			5	To introduce soap production machines	3
			3	To develop a multi-purpose squares	3
			2	To develop electricity facilities	3
			1	To develop stores	3
			1	To install sugarcane pressing machines	1
			1	To install refrigerators for storage	1
			1	To ensure means of transportation.	1
	(5) Others	No recreation goods (e.g., ball) are available. No lodging facilities are available. Deforestation has been advancing. No place for training is available.	5	To develop lodging facilities	2
			2	To implement activities and training for obtaining income	1
1			To understand the fact about workers coming from outside villages	1	
1					
3. Health	(1) Diseases	Infested with tsetse flies. Infested with mosquitoes.	6	To install mosquito nets	6
			6	To install traps to catch tsetse flies	5
				To offer primary care	1
	(2) Medical facilities	There are no health centers. Health promoters are insufficient. Ambulance cars are unavailable. Equipment at the health center is poor. Nighttime medical check is unavailable. Preventive vaccination is unavailable. Doctor's fee is expensive.	12	To develop health centers and assign medical personnel	11
			4	To install necessary equipment	5
			4		
			3		
			1		
			1		
	(3) Medical drugs	Medical drugs are unavailable (no pharmacy) Medical drugs are expensive.	4	To develop pharmacies	5
1			Want doctors to visit routinely to offer	2	

Issue			Countermeasures (needs)	
		Total		Total
			guidance.	
			To distribute medical drugs	1
			To prevent diseases	1
4. Education	(1) Educational facilities	Although there is school, educational materials and equipment are insufficient.		11
		No school in the village.		4
		Conditions of school are poor.		2
		Construction of school is under way but not completed.		2
	(2) Education expenses	Cannot pay educational expenses to school.		3
		Want to improve school enrolment ratio to 100%.		1
	(3) Literacy education	Have received no sufficient education.		2
		No opportunity for training is available.		2
		No opportunity for obtaining information is available.		1
	(4) Others	School for 1st and 2nd graders is in place.		1
		School for 1st and 2nd graders is not in place.		1
		Quality of teachers is poor.		1
No lodging facilities for teachers are in place.			1	
5 . Farmers' organizations	No farmers' organization is in place.		8	
	Organizations have no materials and equipment.		3	
	Farmers' organizations do not function effectively.		2	
	Support for farmers' organizations is unavailable.		2	
	Difficult to organize farmers' organizations.		1	

In each village, slogans assumed suitable for enhancing their strengths further and to reduce the weakness are established as shown in Table 4.13.

Table 4.13 Each Village's Slogans

Route	Parent and child village relationship, etc.	Village	Slogan
Kilueka route	Kimwana	Kimwana	Wonderful village developing with the expansion of animal husbandry and promotion of tourism
	Ndembo	Ndembo	Health comes first Village developing because people are healthy and have a job (a song exists)
	Wene	Wene	People improving their capabilities and village developing through love and cooperation
	Ndunguidi	Ndunguidi	Peaceful village where people get together seeking for pleasant climate and wind
	Kinanga (parent village) Kisiama (child village)	Kinanga	Village ensuring farm land for seed production and producing high quality seeds

Route	Parent and child village relationship, etc.	Village	Slogan	
	Nkondo (child village)	Kisiama	Village enhancing farmers' organization and expanding animal husbandry and banana growing	
		Nkondo	Village needing better living (set phrases exist)	
	Mbanza Ndamba (parent village) Kilueka (child village) Kilueka Site (former refugee camp)	Mbanza Ndamba	Village having many educated young people where farm products can be stored and processed	
		Kilueka	Village promoting the production of tomatoes in dry season and corn in rainy season	
		Kilueka Site	Village developing because of safeness, healthy people and because people cooperate and have a job	
	Nkondo route	Malanga Agglomeration	Malanga Gare	Station village having soil not exhausting and a plenty of fruit trees and windbreak forests
			Malanga Cité (Quartier: 1.2.3. ICB)	Village promoting the use of honey
Zamba		Zamba	Model village for the use of oranges	
Nkumba (parent village) Nkenge (child village) Mawewe (grandchild village)		Nkumba	Village expanding the quantity and variety of peanut processed products	
		Nkenge	Village expanding peanut production through the use of cattle ploughing	
		Mawewe	Village where healthy people increase through water condition improvement	
Kiasungua Agglomeration		Kiasungua (Quartier: Mission, Wenza, Vert)	Village expanding tomato growing and processing	
Kimpalukidi (parent village) Lusasa (child village)		Kimpalukidi	Village promoting a range of fruit tree cultivation and fruit processing	
		Lusasa		
Mpete Nkondo Site (former refugee camp)		Mpete	Village expanding manioc and peanut growing	
	Nkondo Site	Village expanding farmland through soil improvement		

4.3.2 Joint Workshop

Joint workshops were carried out in each zone (a zone is composed of several villages), taking into account of a range of conditions including geography and accessibility to nearby public facilities or markets.

The number of participants per workshop was limited to 30 people, 5 from each village (a village chief, a clan head, a secretary, a representative of women, and a representative of young people). At the workshop, discussions and reviews were made on the direction of the project based on the zone's "strengths (S), weaknesses (W), opportunities (O) and threats (T)." In addition, by bringing the representatives of 20 villages together, a joint workshop was held on the first day as a forum to explain how the workshops would be carried out. At this joint workshop, issues of more public character were discussed. The result of the workshop is shown in Table 4.14.

Table 4.14 The Result of Joint Workshop

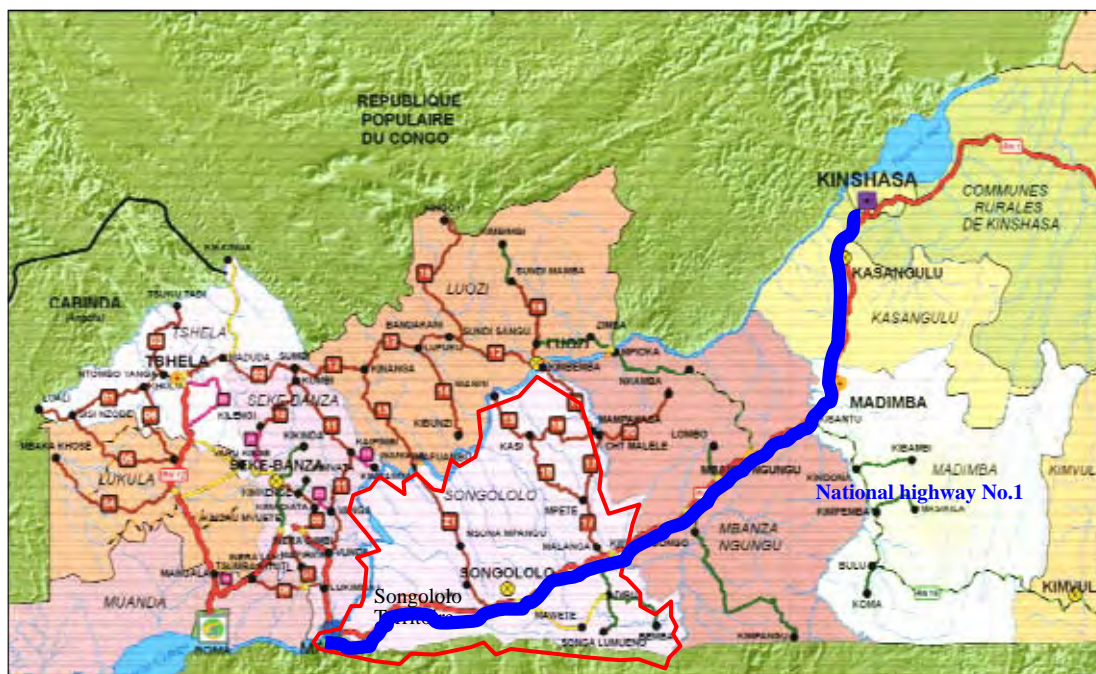
Area	Issue	Proposed Pilot Project
All villages subject to this Study	(Public service-related)	<p>Kinanga route</p> <ol style="list-style-type: none"> 1. Rehabilitation of dispensaries (Kinanga, Kilueka) 2. Repair of school (Kinanga, Wene, Kilueka site, Ndembo) 3. Ensuring of drinking water (spring: Ndembo, Mbanzan-Ndamba, Kilueka site; well: Ndembo, Kinanga, Kisiama, Ndunguidi, Wene) 4. Rehabilitation of the bridge leading to Vampa 5. Support for development
		<p>Nkondo route</p> <ol style="list-style-type: none"> 1. Construction of birthing rooms (Malanga, Kiasunga) 2. Repair of school and arrangement of equipment (Malanga, Kiasunga, Zamba) 3. Improvement of public drinking fountains (Malanga, Lusasa, Zamba) 4. Improvement of well pumps (repair: 2 locations; new pump: 16 locations) 5. Road repair (including enhancement of Cler)
Zone 1	(Agriculture)	<ol style="list-style-type: none"> 1. Training on agriculture 2. Support related farming materials and tools 3. Training on animal husbandry 4. Ensuring of land for replantation 5. Training on agroforestry 6. Activities to prevent intentional burning in grassland 7. Expansion of cultivated field 8. Mechanization of agriculture 9. Construction and maintenance of railing or fence (to protect crops from animals) 10. Maintenance of irrigation channels 11. Storage of farm products 12. Construction of a market in Malanga 13. Enhancement of vegetable cultivation 14. Promotion of aquaculture
	(Living)	<ol style="list-style-type: none"> 1. Construction of an additional birthing room (Malanga) 2. Rehabilitation of a health center (Malanga) 3. Improvement of health and hygiene 4. Construction of markets and road rehabilitation 5. Literacy education and construction of a cultural center 6. Improvement of women's labour environment (e.g., flour mill machines)
Zones 2 and 3	(Agriculture)	<ol style="list-style-type: none"> 1. Improvement of productivity (improvement of agriculture and animal husbandry, introduction of cattle ploughing, farming materials and equipment, training) 2. Promotion of aquaculture 3. Training on farming techniques and farm product processing 4. Enlightenment activities for environmental preservation 5. Support for replantation
	(Living)	<ol style="list-style-type: none"> 1. Literacy education and construction and rehabilitation of school buildings 2. Rehabilitation of wells and health centers 3. Establishment of associations for development
Zones 4 and 6	(Agriculture)	<ol style="list-style-type: none"> 1. Improvement of agricultural roads 2. Improvement of productivity through support for farming materials and equipment 3. Mechanized farming 4. Training on agriculture and animal husbandry 5. Introduction of organic agriculture 6. Support for tools for animal husbandry 7. Maintenance and management of orchards 8. Support to protect farmland from intentional burning
	(Living)	<ol style="list-style-type: none"> 1. Rehabilitation of facilities (Road improvement: Between Kimpese-Kilueka; and Health centers and schools, drinking water: Kilueka) and a market in Wene 2. Support for food processing 3. Support for sport activities 4. Rehabilitation of school buildings and health centers 5. Rehabilitation of local electrification systems
Zone 5	(Agriculture)	<ol style="list-style-type: none"> 1. Improvement of agricultural productivity (support for seeds, support for farming tools, mechanized farming, training on agriculture) 2. Food processing and production of preserved food
	(Living)	<ol style="list-style-type: none"> 1. Improvement of roads between Kimpese-Kilueka 2. Rehabilitation of existing facilities (school buildings, health centers, markets and public drinking water fountains) 3. Rehabilitation of rural electrification systems

4.4 Analysis of Developmental Potential

Although the statistical data useful for the analysis of developmental potential in the Study Area have been collected by organizations in the relevant fields, because of lack of appropriate sorting and editing, it is not always possible to extract necessary data and, thus, it is difficult to identify the potential quantitatively. For this reason, the analysis of developmental potential was carried out using the results of the community profiling, problems and needs of the communities in the Study Area identified at the workshops and in the SWOT analysis implemented in villages and the findings from the interviews conducted during the field reconnaissance and at the relevant organizations.

4.4.1 Community Road Rehabilitation

Figure 4.5 shows the road network in Bas-Congo Province.



Source: Prepared from the data obtained from BTC

Figure 4.5 Road Map of Bas-Congo Province

In Songololo Territory, in which the Study Area is located, the conditions of roads differ significantly between the national highway, provincial roads and community roads. The national highway, which traverses the territory in the east-western direction, has already been repaired and, thus, is in good condition. The repair works on the provincial roads have already commenced and they are in good condition. However, few repair works are in progress in the network of 2,340 km of community roads, which crisscross the entire territory (see Table 4.16).

Table 4.15 Conditions of the Roads in Songololo Territory

Type of road	Location	Length	Condition	Competent authority	Remarks
National Highway	Kimshasa - Matadi (National Highway No. 1)	332 km	Excellent	Office des Routes	Paved with asphalt with funds from the World Bank
	Km5 - Lufu Border	14 km	Good		Repaired by Bas-Congo Provincial Government
Provincial road	Malanga - Kimbemba	96 km	Good		Being repaired
	Kisonga - Kiganga	65 km	Good		Being repaired
Community - Road		2,340 km	Poor	DVDA	Mostly unrepaired

Source: DVDA, Matadi

Since the national highway has already been repaired and the provincial roads have been repaired, villagers living along the community roads directly connected to the national highway or provincial roads have a strong need for the repair of the community roads, which are directly connected to their life and livelihood. This is because the repair of the community roads will improve access to main roads such as the national highway and provincial roads and such improvement will improve traffic access to the capital, Kinshasa, the provincial city, Matadi, and the district town, Mbanza-Ngungu, and increase physical distribution of daily necessities and farm products.

Meanwhile, there are several bridges in very poor condition along the provincial roads which have been repaired. The table below shows the conditions of the bridges along the Kimpese - Luozi Route which passes through the Study Area.

Table 4.16 Conditions of the Bridges along the Kimpese Luozi Route (2004)

Bridge	Distance from the diversion from the national highway (km)	Bridge length (m)	Bridge width (m)	Bridge type	Condition	Repair necessities	Remarks
Pont chemin de fer	3.30	27.6	3.8	Bailey TS 90	Poor	Replacement of wood materials, coating and rust prevention	-
Pont Nkamba	3.60	6.7	7.5	Reinforced concrete (BA)	Excellent	Installation of steel guardrails and improvement at the approaches to the bridge	-
Pont Ndungua	5.30	12.2	10.4	BA	Good	Installation of steel guardrails and improvement at the approaches to the bridge	With 3 culvert of Φ 3m
Pont Sindu	8.00	4.2	6.5	BA	Good	Cleaning	Removal of plants
Pont Nkenge 1	15.30	11.2	3.1	BA	Good	Installation of steel guardrails	-
Pont Nkenge 2	15.40	6.0	3.0	BA	Good	Installation of steel guardrails and widening of the approaches to the bridge	-
Pont Mawewe	16.00	7.2	7.7	Pont Busé	Poor	Repair of concrete parts	Culvert of Φ 4.1m

Pont Fuamaza 1	22.00	12.9	3.0	BA	Poor	Installation of steel guardrails and repair of concrete parts	Verification of bridge piers
Pont Fuamaza 2	22.40	19.2	3.0	BA	Poor	Installation of steel guardrails and repair of concrete parts	-
(Bridge without name)	25.00	13.5	4.0	BA	Good	Installation of steel guardrails and widening of the approaches to the bridge	Damage to the surface of the vehicle road
Pont KIMU	27.00	12.8	4.0	BA	Good	Installation of steel guardrails	-
Pont Lukunga	35.00	11.9	6.6	BA	Good	-	-
Pont Yaya	53.00	12.4	6.7	BA	Good	-	Verification of bridge piers
Mpangazi	67.00	13.1	6.1	BA	Poor	Widening of the bridge	Verification of bridge piers
Lubiolongo	87.00	9.1	6.3	BA	Good	-	Erosion

Source: DVDA, Matadi

As the table above shows the results of the study conducted five years ago, there is possibility that a condition of a “good” bridge might have been deteriorated. Therefore, there is a strong and urgent need to implement a detailed study and to repair the bridges. The need to repair bridges is high not only along the above-mentioned route, but also in the entire Bas-Congo Province in which there are many tributaries to the Congo River and tributaries to creating valleys and marshes.

4.4.2 Improvement in Agricultural Productivity

The land use in the Study Area is decided by precipitation. In the rainy seasons, the staple crops, *i.e.* cassava and peanuts, are cultivated mainly in the fields at high altitude with good drainage and only a small portion of the inland valleys formed by rivulets is used for cultivation of maize and sugarcanes since the inland valleys become inundated temporarily after rainfalls. Meanwhile, in the dry seasons, vegetable farming using the rivulets as water sources is the main agricultural activities, which is practiced in inland valleys for the ease of manual irrigation. These rivulets are perennial and available as water sources all year round. The climate with the average temperature of *ca.* 25°C all the year round allows farmers to grow crops three times a year in the Study Area.

(1) Expansion of cultivation area

Farmland: Cassava cultivated in the rainy seasons is the staple food in the Study Area. It is cultivated for self-consumption and is also one of the important cash crops. Harvested cassava is sold without any processing or sold as chickwangué (preserved food like rice cake made from cassava flour) after being processed by village women. Chickwangué produced in the Study Area, in particular, is known for its quality and considered as a specialty. It is important for the farmland not to be affected by flood water from rivulets if it is to be used for farming in the rainy seasons. Therefore, inland valleys are not suitable for the farmland because they become temporarily inundated after rainfalls. Reddish-brown laterite soil is found in some parts of the Study Area. After excluding those areas not suitable for

field farming, there still remains significant area of unused land.

Inland valleys: Inland valleys along rivulets are used for cultivation of vegetables as cash crops in the dry seasons with irrigation using water from the rivulets. However, use of the inland valleys along rivulets for farming is limited because of the temporary inundation after rainfalls in the rainy seasons as mentioned above. The Study Area in which the Lukunga River flows in the north-south direction and many tributaries flow into it has a large area of inland valleys which are not used in the rainy seasons. Use of the valleys not used in the rainy seasons for dry-season vegetable farming requires removal of weeds which have grown vigorously during the rainy seasons or clearing, before every dry season. Meanwhile, a significant number of people living in Kimpese commute to villages in the Study Area do farming activities everyday.

(2) Introduction and extension of cash crops

The Study Area has easy access to Kimpese, a market for vegetables and the center of the sector with a rapidly growing population. In addition, the improved national highway allows a round trip to the provincial city, Matadi, or the capital, Kinshasa, within a day. Because of the relative proximity to the markets, dealers come from the urban areas to the villages to purchase farm products. The most widely grown vegetable in the Study Area is onion. In fact, almost all the farmers in the areas grow onions. In addition, they grow tomatoes, green peppers and cabbages. However, they are grown in area far smaller than the area in which onions are grown.

In the Study Area, INERA and NGOs (Agrisud and CRAFOD) are working on improving farming methods and providing improved seeds. Access to these agriculture-related organizations is easier in the study area than in other areas. The features of the activities of the said organizations include introduction of improved variety of cassava (with high yield and a short cultivation period) and assistance in extension of vegetable farming methods.

4.4.3 Improvement in Value Addition to Farm Products

The most common processed farm product in the Study Area is chickwangue produced from cassava. Other processed products are basically produced by processing the farm products harvested in villages. Such products include peanut paste, palm oil, sugarcane juice and sugarcane wine. These products were produced by manual processing with hand-made tools. Meanwhile, in Kimpese, an NGO produces *pili pili* (processed peppers), tomato purée, boiled vegetable and honey and the *pili pili* and tomato purée are widely distributed in the market.

4.4.4 Diversification of Income Source

Livestock such as chicken, ducks, goats, sheep, guinea pigs and pigs are raised in villages not only for self-consumption but also as a valuable income source other than farm products. In the Study Area, livestock usually range freely. While simple stables are provided for chickens, the only facilities

for the other livestock are simple fencing; therefore, they are raised extensively. Before the civil war, piggery in well equipped pigsties and animal husbandry were practiced in addition to extensive livestock farming as practiced at the present day. Small-scale bee keeping and aquaculture are practiced in the Study Area.

As another source of income, fruit trees such as bananas, mangoes, oranges and safus (fruits with yellowish-green sour-sweet flesh and purple skin), are grown. Bananas are managed with regular root division. New species and improved varieties are purchased and grown by interested villagers from time to time.

4.4.5 Improvement of Living Environment

Strong needs for supply of drinking and domestic water, repair of community roads, repair of grinding mills and improvement in roofing materials (from grass to galvanized iron sheets) were confirmed in the workshops held in villages.

River water is used as sources of drinking and domestic water in many villages. Few villages use wells as water sources. It is assumed from the depths of the existing wells and existence of springs that a depth of 10 to 15 m is sufficient for a well to be constructed near a residential district of a village to supply sufficient amount of water to villagers. Establishment of a water source relatively close to a residential district will shorten the time required for fetching water. A chemical required for chlorinating drinking water can be obtained from EMI free of charge.

Because relatively easily accessible villages along the trunk roads were selected for the study, all the selected villages can be reached by vehicles. It appears that communal work systems among villagers such as *Salongo* are used for regular road maintenance and repair by villagers.

4.4.6 Improvement of Natural Environment

Villagers expressed personal opinions such as “It is very important to maintain the natural environment in and around the village in good condition” and “We should avoid destroying the environment for the coming generations” in the workshops held in villages. This observation is considered as the evidence that they are well aware of the importance of natural environment. Many villagers admit that burning of fields is an act of destroying nature. However, they have not been able to find any measures against the burning and the burning continues destroying trees and bringing damage to farmland. Further educational activities for and replantation by villagers will be required for the improvement of the situation.

4.4.7 Improvement of Public Facilities

Although the administrative services in the Study Area are not sufficient, public facilities such as schools and health centers are found in every few villages. And, some teachers commute from Kimpese or other villages in the area to their schools because of lack of accommodations near the

schools, schools have enough teachers. Similarly, health centers have sufficient nurses.

(1) Public facilities

Schools and health centers in the Study Area do not receive sufficient administrative services from the administration and, in its place, NGOs and communities in which the schools and health centers are located maintain the facilities and the functions of the facilities.

(2) Literacy education

There is a strong need for literacy education for women who have been too busy with childcare, household chores and farming to receive sufficient education. There are so many literate farmers in villages that it will be easy to find teachers of literacy education.

(3) Health promoters

Health facilities are training health promoters with the target of one health promoter for every 15 households to implement information dissemination and educational activities in the health sector. It is expected that the educational activities in communities can reduce the cases of the major diseases, *i.e.* malaria and diarrhea. Since health promoters who have already received training and practical lessons have knowledge of the major diseases, the system of health promoter can be improved by implementing new educational activities such as picture story shows.

4.5 Developmental Constraints

Because statistical data useful for the analysis of developmental constraints in the Study Area have not been sorted or edited appropriately in the relevant organizations as is the case with the analysis of developmental potential, it is difficult to identify constraints quantitatively. For this reason, the analysis of developmental constraints was carried out using the results of the community profiling, problems and needs of the communities in the Study Area identified at the workshops and in the SWOT analysis implemented in villages and the findings from the interviews conducted during the field reconnaissance and at the relevant organizations.

4.5.1 Community Road Rehabilitation

The issue of landownership is on the top of the list of constraints to community road rehabilitation. This constraint is not restricted to the Study Area. The government owns land itself and farmers have a traditional right to farm on the land. Therefore, sites for road works are legally owned by the government and the government has legal power to expropriate villagers. However, in reality, as some villagers complain or protest against land expropriation, very careful attention will have to be paid when expropriating land. Delay in the work itself in the rainy seasons is a constraint in the Study Area which has annual rainfall of 1,600 mm. Therefore appropriate work implementation management in the dry seasons will be required. As a plan for road maintenance after completion of

the work, DVDA is to establish CLER for each and every improved community road to maintain all the community roads. However, because of the difficulty in securing the budget, maintenance by CLER has not been established for all the rehabilitated community roads. Since DVDA is an organization to implement manual road construction and maintenance works in principle, input of equipment will be required so that it can work on roads which cannot be repaired manually.

4.5.2 Improvement in Agricultural Productivity

(1) Expansion of cultivation area

Farmland: In the Study Area, not only farm work but also transport of farm product has not been mechanized. A series of work from weeding, felling of bushes, plowing, watering to harvest is done manually with several types of farming tools. A common means of transport of crops from farmland to villages or roadsides is to put them in a bucket or a sack and carry it on the head. Bicycles are used as means of transport on road. Transport vehicles such as lorries are used by dealers from urban areas for transport of farm products and no villager owns a lorry. Cattle ploughing such as oxen and donkeys are no longer in use. Expansion of cultivation area in the rainy seasons requires improvement of working efficiency of plowing, which is a major limiting factor for the expansion. However, because it is difficult to introduce mechanical plowing in the Study Area for the reason mentioned above, it is practical to use cattle for the improvement of plowing efficiency. However, since cattle are not raised as livestock in the Study Area, there will be a need for training on how to raise cattle and training of cattle for plowing.

Inland Valleys: Inland valleys along rivulets are not used because it is not possible to grow vegetables or other crops there due to temporary inundation after rainfalls. Although these valleys can be used as paddies, rice cultivation has hardly been observed in the Study Area. If the inland valleys along rivulets are to be used as rice-paddies, technical assistance in rice-cultivation will be required.

(2) Introduction and extension of cash crops

Onion accounts for a great majority of cash crop production in the Study Area. Since preparation for onion cultivation begins at the end of the rainy season and it is cultivated as a dry season crop in most of the cases, onions are harvested almost at the same time in almost all villages. Farmers do not practice sales of crops after keeping them at home for a certain period of time. Despite vegetable cultivation being the major source of income, farmers have problems that they cannot purchase agricultural materials and equipment at appropriate time, that cultivation technology is poor, etc.

4.5.3 Improvement in Value Addition to Farm Products

Processing of farm products observed in the Study Area is practiced by individuals with simple tools and processed products are mainly sold within villages. Because of the difficulty in finding

means of transport and low sales prices, farm products cultivated and harvested in the Study Area do not always bring income to farmers. Besides vegetables, products such as mangoes cannot be stored for a long time after harvest.

4.5.4 Diversification of Income Source

Large numbers of chickens and pigs can be raised with use of appropriate raising techniques. However, there is no farmer in the Study Area who raises livestock while keeping and feeding them in stables. Farmers are unable to raise large numbers of improved varieties of livestock because they cannot obtain enough feeds for livestock, they cannot obtain money to introduce improved varieties, they cannot afford the risk of simultaneous loss of a large number of livestock due to a disease, etc., they are too busy cultivating crops in farmland to have time to spend for care of livestock, etc. Therefore, at present, they raise chickens, pigs, goats, etc. with little care and their sales prices are low. Improved varieties of pigs are larger than local varieties and the litter size of the former is larger than the latter. However, improved varieties require to be raised in pigsties. Therefore, introduction of improved varieties of pigs will require training and educational activities to farmers on pig-raising including construction of pigsties, feeding and cleaning of pigsties and pigs.

Aquaculture using small streams and springs and beekeeping in forests near villages can be introduced to villages where the conditions required for these activities have been met. However, sufficient technical assistance including how to obtain fingerings will be required.

4.5.5 Improvement of Living Environment

Among the existing wells at several locations in the Study Area, those at two locations (Kinanga and Malanga Cité) have been unusable for more than several months because the pumps have been broken down. This observation shows how difficult it is to maintain wells including the other operational ones. It will be necessary to implement educational activities on maintenance of wells prior to construction of wells in this Study and commence construction where and when villagers have fully understood the maintenance. In addition, it will be necessary to provide technical assistance on maintenance procedures and in preparation of manuals. It will be necessary to confirm availability of pumps and their parts not only in Kimpese but also in the capital, Kinshasa, and to have alternative ways of taking water from wells such as installation of well buckets and ropes in case it is found difficult to procure them at either place.

Maintenance of community roads has been implemented by organizations for communal works in villages such as Salongo. However, since villagers have no tool other than farming tools meant for farming activities or no means of transport, while they have been repairing roads near villages partially as part of the maintenance work, they have not been able to respond to deterioration of road conditions, especially those caused by poor drainage. Because there is absolutely no possibility of road maintenance being provided as an administrative service, it is necessary at first to establish a

mechanism which enables use of simple tools for road construction and wheelbarrows in Salongo in villages which are located relatively far from trunk community roads or have places requiring improvement or repair of drainage facilities.

Among the works performed by women, grinding of cassava, in particular, is one of the most strenuous works as it requires manual work with pestles and mortars and long hours of work. Collection of firewood for cooking is considered as work of women and children. Workload of household chores including those mentioned above, as well as water fetching for cooking and washing, is heavy. As a measure to reduce the workload of household chores through reduction in firewood consumption, improved cooking stoves will be introduced. In order to promote activities of women's groups, which does not exist in a large number in the Study Area, handicrafts in which women can work together will be introduced.

4.5.6 Improvement of Natural Environment

Although the administration imposes penalty for "field fires," the destruction of nature closest to villagers, the penalty has no impact and fields are burned at throughout the dry seasons. Under such circumstances, it will be necessary at first to restore vegetation gradually by commencing aggressive replantation activities to increase forest cover (fruit tree orchards) and to obtain harvest from the forests, as well as to continue educational activities steadily. Simultaneously with the replantation activities, technical assistance on seedling production will be provided with the aim of training technicians who can grow seedlings at each village.

4.5.7 Improvement of Public Facilities

Because the administration does not allocate sufficient budget to the operation of public facilities in the Study Area, the budgetary shortfall has been supplemented with donation from NGOs and villagers. Despite the donation, the facilities have continued being unable to raise sufficient revenue required for their operation. Consequently, some schools do not have enough desks or chairs and other have classrooms which cannot be used on rainy days because they cannot afford to repair their roofs. In most cases, villagers repair the facilities voluntarily; however, they do not have enough materials or carpentry tools for the repair. Villagers perform part of the administrative services voluntarily; the largest task is how to ensure sustainability of such activities by villagers.

(1) Public facilities

Existing schools and health centers are operated and maintained voluntarily by villagers who use these facilities, because administrative services in the Study Area are insufficient. However, they have problems such as lack of tools to repair facilities, as well as required materials and equipment.

(2) Literacy education

While the need is high for literacy education, the administration does not provide support to

literacy education at the moment. The priority should be given to the use of literate residents in villages as teachers of literacy education as an important measure to ensure sustainability of the project.

(3) Health promoters

It is possible to reduce the cases of the major diseases in the villages, malaria and diarrhea, by improving sanitary conditions. At present, drugs for headache and fever are the most consumed drugs in the villages. In other words, drugs for malaria are the most consumed. Therefore, it will be necessary to continue educational activities on malaria, in particular.

Although health promoters have already been appointed at the rate of one promoter per *ca.* 15 households, many of them are inactive. Implementing educational activities through promoters is practical and effective. However, it is necessary to improve the methods to make the activities easier to understand for the residential area (*e.g.* use of picture story shows).

4.6 Results of the Analysis of Communities in the Study Area

The table below shows the problems and needs of the villages in the Study Area sorted out by field and summarized developmental potentials and constraints.

Problems/Needs	Developmental potentials/constraints
1. Agriculture	
(1) Improvement in productivity - Introduction of seeds, etc. with expected high yield, such as improved cassava. - Introduction of mechanized farm work in order to increase cultivation area	(Developmental potentials) - The Study Area have favorable weather conditions in terms of precipitation and temperature and rain-fed grain farming is practiced in the rainy seasons. There is a large area of unused arable land. - Vegetables grown in the dry seasons using water from perennial rivulets are valuable cash crops. (Constraints) - Villagers cannot purchase agricultural materials and equipment when they are required. - Although increase in cultivation area requires mechanization, there is no service to lend tractors, etc. to villagers.
(2) Training in agricultural technology - Technical training on cultivation calendars, soil preparation, seed preservation methods (for cassava), etc.	- Few administrative services, such as agricultural extension officers, are seen in the area.
(3) Improvement in productivity of livestock, fruit trees, etc. and training - Introduction of improved varieties of livestock - Introduction of seedlings of a fruits tree with high commercial values	(Developmental potential) - As a source of cash income, livestock are raised and fruit trees are grown in all the villages. (Constraints) - Fruits trees have not been replanted or varieties with high commercial values have not been introduced. - There might be no means to prevent or treat livestock diseases.
2. Life	
(1) Supply of drinking and domestic water - Construction of new wells and repair of existing wells to ensure supply of drinking and domestic water.	(Developmental potential) - It is assumed from the depths of the existing wells and existence of springs that sufficient amount of water can be obtained from wells with depths of 10 to 15 m. - Time spent on fetching water can be reduced with establishment of water sources relatively close to villages. (Constraints)

Problems/Needs	Developmental potentials/constraints
(2) Reduction in workload of household chores - To reduce workload of firewood collection, fetching water and grinding of cassava, which are works for women and children	- Although the chemical for chlorinating drinking water can be obtained from EMI free of charge, replacement of its stock takes some time because the stock has to be procured in Kimpese. - Because commercial electricity supply is not available in the Study Area, grinding mills are powered by diesel engine. Operation and maintenance of such grinding mills is difficult.
3. Public services (in health and education)	
(1) Improvement of public facilities - Repair of existing facilities and improvement of equipment	(Developmental potential) - As is seen in <i>Salongo</i> , villagers have long provided labor to maintenance of public facilities and provided food to laborers. - As there are many literate farmers in villages, it is easy to find teachers of literacy education. (Constraints)
(2) Literacy education - Measures for literacy education	- Much cannot be expected from the public services in repair of public facilities because it takes a significant amount of time for the public services to do the work. - Although the villagers can provide labor, it is difficult for them to purchase materials and equipment such as tools and cement required for the work.
4. Villagers' organizations	
(1) Strengthening of villagers' organizations - To improve and strengthen villagers' organizations as there are villages without such organization and many of the existing ones are not functioning.	(Constraint) - When strengthening or establishing villagers' organizations, sufficient consideration has to be given so that there will be no conflict between members of the organizations and other villagers.

Chapter 5 Planning Orientation of Community Development Plan

When the community development plan targeting on Lukunga river valley of Kimpese suburb area in Cataractes district, Bas-Congo province, was planned, the development vision based on the policies of the DRC, development potentials in the Study Area, and the results of analysis of impediment factors was set, and the development objectives of projects to achieve this vision and measures to realize those objectives were discussed.

This chapter will describe the overview of the community development plan (design), target year of the development, and implementation system.

5.1 Community Development Plan (design)

5.1.1 Overview of the Community Development Plan (design)

The contents of the community development plan were intended to items which the residents can implement development activities, and maintain and manage them by themselves. As described in the chapter 4, the development plan is consisted of 4 fields such as 1) rehabilitation of community roads, improvement of 2) livelihood, 3) living environment, and 4) public facilities (services) as shown in the figure 5.1 according to issues and needs, development potential and impediment factors which were discovered by the survey of the Study Area and community profiling survey.

Current Situation	Issues	Measures	Plan
<p>Basic infrastructures</p> <ul style="list-style-type: none"> Transport of people and goods turns difficult especially in rainy season due to bad condition of roads. 	<p>Vulnerable basic infrastructures</p> <ul style="list-style-type: none"> Bad condition of roads (especially in rainy season) 	<p>Road rehabilitation</p> <ul style="list-style-type: none"> To improve principal roads necessary for transport of people and goods. 	Road rehabilitation
<p>Agricultural production</p> <ul style="list-style-type: none"> Staples (cassava, maize, etc.) in rainy season and vegetables (mainly onion, plus pepper, tomato, eggplant, cabbage, etc.) in dry season are produced with low productivity. 	<p>Low agricultural productivity</p> <ul style="list-style-type: none"> Limited labor force and limited cultivation area achievable by manual agriculture. Low yield per unit area. Repeated cultivation of same crops which lowers the land productivity. 	<p>Expansion of farmland area</p> <ul style="list-style-type: none"> To expand cultivation area by cattle ploughing instead of tractor which is difficult for maintenance. 	
<p>Non-agricultural production</p> <ul style="list-style-type: none"> Livestock like pig, goat, sheep, chicken and guinea pig are raised extensively in the open air in many villages. Some villagers, not many, grow fruit trees. 	<p>Limited income source</p> <ul style="list-style-type: none"> Small variety of agricultural products in the area. Existence of few intensive livestock farmers. Undervalued use of local resources such as vines and palm leaves. 	<p>Improvement of soil</p> <ul style="list-style-type: none"> Preparation of better soil by application of compost and other materials for soil improvement. 	
<p>Natural environment</p> <ul style="list-style-type: none"> Many trees were cut by a timber company ("IZB" of Malanga). Lots of garbage are found, mainly plastic bags, in the village. 	<p>Poor natural environment</p> <ul style="list-style-type: none"> Existence of very few trees. Garbage in village deteriorates the view and risks the released animals which could swallow them accidentally. 	<p>Introduction of new crops</p> <ul style="list-style-type: none"> To introduce short-term crops like cucumber, zucchini, pumpkin, etc. which are not widespread actually. 	
<p>Living environment</p> <ul style="list-style-type: none"> Milling of cassava to make staple food like chikwangues and fofou is heavy labor. Carriage of water in every morning goes long distance. Many fuel woods should be gathered frequently. 	<p>Hardships in daily life</p> <ul style="list-style-type: none"> Heavy labor of milling cassava. (done by women in the evening) Time-consuming hard labor of carriage of water and fuel wood (especially for women). 	<p>Diversification of income source</p> <ul style="list-style-type: none"> To diversify agricultural production by rice farming, livestock farming, aquaculture, bee keeping, etc. 	Improvement of living environment
<p>Education</p> <ul style="list-style-type: none"> Difficult schooling due to lack of schools nearby, and drop-out of some students who cannot afford the fee. (about 3,000FC / semester, equivalent to 500JPY) Delay in the start of new semester (normally September) or unexpected stop of class due to pending salaries for teachers. 	<p>Poor educational conditions</p> <ul style="list-style-type: none"> Long distance and poor roads make difficult the children's trip to school. Some students cannot afford the school fee and drop out. Pending payment of salaries to teachers. 	<p>Improvement of natural environment</p> <ul style="list-style-type: none"> To promote reforestation. 	
<p>Health and medicine</p> <ul style="list-style-type: none"> Diseases caused by water like malaria (vectored by mosquito which lives in pools) and diarrhea affect many people. Insufficient number of doctors and nurses, and their limited availability to fully respond to peoples' demands. 	<p>Poor health/medical conditions</p> <ul style="list-style-type: none"> Limited services are available at health centers and health posts. 	<p>Fund raising for local activities</p> <ul style="list-style-type: none"> To use the income gained from the products of roadside trees for the maintenance of roads, schools and health/medical facilities. 	Improvement of public facilities
		<p>Improvement of living environment</p> <ul style="list-style-type: none"> To decrease the daily consumption of fuel wood by introduction of improved cooking stoves. To ease the labor of carriage of water by installation of wells. 	
		<p>Rehabilitation of schools</p> <ul style="list-style-type: none"> To rehabilitate schools through repair of roof and wall and provision of desks and chairs. 	
		<p>Rehabilitation of health facilities</p> <ul style="list-style-type: none"> To rehabilitate health / medical facilities through repair of roof and wall. To improve health conditions and medical staffs in collaboration with the health zones. To decrease hydric diseases through installation of wells. 	

Figure5.1 Fixing of the community development plan (design)

(1) Rehabilitation of community roads

Although the community roads play a significant role such as transportation of products and access to the public services, the traffic is very difficult, particularly in the rainy season, because width of road becomes narrow due to erosion, and large bores appear by being affected by the rain. One of reasons is the lack of maintenance.

The plan relating to the road, it is planned that the road rehabilitation is separately implemented by the quick impact project for the Kilueka route, whereas the community road is kept in a good condition by maintenance for the Nkondo route, because it has been already rehabilitated.

(2) Improvement of livelihood

Priority should be given to improve agricultural productivity in this Study Area where most of the income depends on agriculture. Despite the favorable natural conditions of rainfall and temperature which enable cultivation of cereals during rainy season and vegetables during dry season, the current level of productivity remains quite low due to several factors such as low labor productivity of totally manual agriculture, unused fertile lands, deficient dissemination of adequate cultivation techniques, extensive manner of livestock raising, etc.

Therefore, the challenges to improve agricultural productivity include the enhancement of crop productivity by holistic improvement of cultivation techniques such as introduction of improved varieties, methods of cultivation, soil preparation, etc. as well as the enhancement of labor productivity by means of animal traction such as use of cattle. In addition, income sources other than agriculture should be diversified such as animal husbandry and aquaculture.

However, mechanization is not focused in this development plan taking into account the difficulty in its operation and maintenance, as foreseen in the case of pump to replace the current manual irrigation which is a bottleneck against expansion of vegetable cultivation areas, and in the case of tractor which may bring about great improvement in the labor of soil tillage. By contrast, the present development plan gives priority to introduction of the methods and techniques of cultivation which are already practiced in the Study Area or neighboring areas.

(3) Improvement of living environment

There are a wide range of issues related to the living conditions, an indispensable space for the residents' daily life, including the natural environment of the surrounding area as well as the matters of social/cultural character such as limited access to safe drinking water, heaviness of labors performed principally by women like milling of cassava and carriage of water, damages to trees and farmlands caused by burning practice around the villages, etc.

Most important issue in this category is to ensure access to drinking water. However, abandoned wells due to breakdown of pumps are observed in the Study Area, suggesting the weakness in the

system of operation and maintenance by the residents which needs to be strengthened together with the proposed improvement of water facilities. Also, heavy labors imposed on women and children such as carriage of fuel wood and water should be relieved. In addition, activities participated by wider residents and groups like handicraft is encouraged as part of the improvement of living environment, in view of the fact that women's actions can become more active by providing them with opportunities to get together constantly among several persons to perform the same work with mutual communication.

As for the improvement of natural environment, conservation of remaining forests and intensive reforestation are needed. Although the effects of these activities require longer term to appear than others, the residents' own effort should be centered for improvement of the environment in such ways as selecting larger portion of fruit trees for planting, putting emphasis on technical trainings about preparation of seedlings from seeds and methods of transplantation, etc.

(4) Improvement of public facilities (public services)

Among the public facilities, schools are particularly in bad condition as for roof, wall and floor due to insufficient maintenance. Other public facilities such as health centers and roads are also deteriorated and this situation leads to quite strong demand by the communities for improvement and rehabilitation of public facilities.

In view of the foreseen difficulty of secure budget allocation by the government, this development plan focuses the operation and maintenance of the facilities led by the residents and proposes the rehabilitation of the facilities which could be achieved by the communities. Concrete proposals are also given on the method of operation and maintenance of rehabilitated facilities as well as acquisition of necessary fund. Regarding the rehabilitated roads by quick impact project, its sustainable operation and maintenance by benefited communities are included in the plan.

Public services are limited also for the prevention of malaria and diarrhea caused by water which are principal diseases and for the literacy education as well, in spite of great need for them. Efficient use of human resources found in the communities as well as adequate operation system is proposed in the development plan in order to tackle these issues effectively and with less cost.

5.1.2 Target Year of the Development and Items Relating to Each Field

Major issues of the Study Area and corresponding measures are summarized in the following table based on the field survey of current situation. They are classified in the plans of "improvement of livelihood" and "improvement of living environment (including the improvement of public facilities)". It is expected that the implementation of these projects could contribute to the development of communities as desired by the residents. As it will be described, the rehabilitation of community roads is absolutely imperative to improve those fields.

Furthermore, lack of electricity and scarcity of diversions in the villages were also mentioned as additional issues during the field survey. However, the formulation of community development plan should take into consideration the importance of sustainable development led by the residents rather than tackling all the issues at the same time. Therefore, those fields are excluded from short- and medium-term objectives.

Under the present concept of community development, 5 years is given for medium-term objectives, and corresponding actions form an integrated community development plan. On the other hand, regarding the issues of longer term, a specific target year is not set due to the current political instability of the DRC. A conceptual diagram of the chronologic development of the communities with expected accomplishment of short and medium-term objectives is shown in Annex 5.1.

Table 5.1 Issues and proposed measures of the Study Area

Issues	Measures	Plans
Low agricultural productivity; Limited income source	Expansion of cultivated area; Introduction of new crops; Diversification of income source	Improvement of livelihood
Poor natural environment; Hardships in daily life	Improvement of natural environment; Fund raising for local activities; Improvement of living environment	Improvement of living environment (actions achievable at village level)
Bad condition of roads (especially in rainy season); Poor educational conditions; Poor health/medical conditions	Rehabilitation of principal roads for transport of people and goods; Rehabilitation of schools; Rehabilitation of health facilities	Improvement of living conditions (improvement of public facilities at zone level)

(1) Prioritization of rehabilitation of community roads

Community roads directly affect the improvement of livelihood and living environment through transport of products and purchase of commodities. The following table compares the cases with and without the rehabilitation of roads, where the transport is currently troublesome. As shown in the table, rehabilitation of roads is expected to bring about improvement of livelihood and living environment, and should be given priority in the first place for planning and implementation of the community development.

Table 5.2 Comparison of effects by rehabilitation of roads

Class	Item	Without rehabilitation of roads	With rehabilitation of roads	
			Short-term effect	Long-term effect
Improvement of livelihood	Improvement of agricultural productivity	<ul style="list-style-type: none"> Agricultural produce cannot be transported outwards. 	<ul style="list-style-type: none"> Agricultural produce will be transported easily and with less damage. Seeds and agricultural tools will be brought easily. 	<ul style="list-style-type: none"> Residents' income will increase due to the increase in the amount of transported products outwards.
	Addition of values to the products	<ul style="list-style-type: none"> Opportunities to learn addition of values to the products (such as processing) are limited due to the limited information and visitors from outside. 	<ul style="list-style-type: none"> Products will gain additional values. Actions oriented for marketing of value-added products (such as bottling) will be started due to easier transport of the products. 	<ul style="list-style-type: none"> Residents' income will increase to some extent due to the increase in the amount of value-added products.

Class	Item	Without rehabilitation of roads	With rehabilitation of roads	
			Short-term effect	Long-term effect
	Diversification of income source	<ul style="list-style-type: none"> Opportunities to learn diversification of income source (such as livestock and rice cultivation techniques) are limited due to the limited information and visitors from outside. 	<ul style="list-style-type: none"> Learned new techniques will be practiced in livestock farming, rice cultivation, etc. Products of new activities will be transported easily. 	<ul style="list-style-type: none"> Residents' income will increase to larger extent due to the extension of diversification of income source.
Improvement of living environment (village level)	Improvement of living environment	<ul style="list-style-type: none"> Acquisition of commodities for daily life takes time and the needed materials are sometimes not available at timely moment. 	<ul style="list-style-type: none"> Acquisition of commodities for daily life will become easier. 	<ul style="list-style-type: none"> People will benefit from wider range of life-style thanks to the availability of needed commodities at timely moment.
	Natural environmental preservation	<ul style="list-style-type: none"> Reforestation activities are not promoted actively due to the time-consuming transport of seedlings. Non-flammable garbage is not removed and accumulates in the village. 	<ul style="list-style-type: none"> People will afford to take actions for natural environmental preservation thanks to the improved living environment. 	<ul style="list-style-type: none"> Natural environmental preservation will be promoted through such activities as agro-forestry.
Improvement of living conditions (zone level)	Improvement of health and hygiene	<ul style="list-style-type: none"> Risks of chronic diseases and mortality are enhanced due to the time-consuming transport to hospitals. 	<ul style="list-style-type: none"> Risks of chronic diseases and mortality will be decreased due to easier transport to hospitals. 	<ul style="list-style-type: none"> Incidence of diseases and illness among villagers will decrease due to the adequate preventive measures.
	Improvement of educational environment	<ul style="list-style-type: none"> Going to school takes time. Young children cannot go to school. Teachers of good ability can hardly arrive. 	<ul style="list-style-type: none"> Teachers will be able to stay longer in the village due to easier transport from the city. Children will be able to go to school easily. 	<ul style="list-style-type: none"> Schooling rate will increase thanks to easier way to schools. Literacy rate of the community will increase. Diverse activities of livelihood improvement will become possible and income will consequently increase in general terms.

The above table explains the expected results by the project: however, rehabilitation of roads could bring negative effects as well. Positive and negative effects are both summarized as shown in the figure 5.2. Although rehabilitation of community roads is accompanied with negative effect, it is expected to bring about more positive effects than negative ones.

Positive

	<ul style="list-style-type: none"> Increase in visitors 		
	<ul style="list-style-type: none"> Easier transport to schools. 	<ul style="list-style-type: none"> Increase in schooling rate. 	
	<ul style="list-style-type: none"> Easier transport of sick people. 	<ul style="list-style-type: none"> Decrease in incidence of diseases. 	
	<ul style="list-style-type: none"> Easier acquisition of commodities. 	<ul style="list-style-type: none"> Improvement of living environment. 	
	<ul style="list-style-type: none"> Easier transport of agricultural produce. Less damage to agricultural produce. More freshness of agricultural produce. Lower cost of transport. 	<ul style="list-style-type: none"> Expansion of commercialization Higher value added to agricultural produce. More frequent transport becomes possible. Diversification of agriculture due to easier introduction of new techniques. 	<ul style="list-style-type: none"> Increase in income.
	<p><u>Direct effects</u></p> <ul style="list-style-type: none"> Increase in garbage brought by increased number of visitors. Increase in traffic accidents. 		<p><u>Indirect effects</u></p>

Negative

Figure 5.2 Effects of rehabilitation of roads

Conditions are different in the two routes of the Study Area, namely “Kilueka route” where community roads have not been rehabilitated and “Nkondo route” where provincial roads already existed. In other words, the effects of the PPs are expected to appear soon in Nkondo route due to its already existing roads, while, the effects of the PPs could not fully appear until the community roads are rehabilitated in Kilueka route.

Table 5.3 Difference between Kilueka route and Nkondo route

Kilueka route (before rehabilitation) 【Communities without good roads】	Nkondo route 【Communities with good roads】
<ul style="list-style-type: none"> • Light traffic. • Transit of few trucks (frequent blockage by dirt or fall into ditch). • Large number of cart. • Transport of agricultural produce mainly by truck. • Many people engaged in agriculture (Mainstay is crop production; farming of livestock and fruit trees may require time to start). 	<ul style="list-style-type: none"> • Heavy traffic. (Regular transport service to Luozi and Kasi is available) • Transit of many large trucks. • Small number of cart owned by individuals. • Transport of agricultural produce mainly by bicycle. • Many people challenging diversification of agriculture (those who intend and implement farming of livestock and fruit trees).

(2) Improvement of livelihood

Average daily income per capita in the Study Area is estimated as 0.76US\$ in rainy season and 0.93US\$ in dry season (see section 4.2.2 of chapter 4), which evidences that the standard of living of many people is below 1 US\$ per day. Improvement of agricultural productivity was mentioned as first important issue in the workshops and people’s need for livelihood improvement by strengthening of agricultural production is considerable. Therefore, “program related to improvement of livelihood” is positioned as an urgent issue to be solved in short term like “rehabilitation of community roads”. The following table shows the issues of livelihood at field level and corresponding proposed measures.

Table 5.4 Issues and measures related to livelihood improvement

Item	Issues	Measures
Improvement of agricultural productivity	Improvement of labor productivity by expansion of cultivated area with methods manageable by farmers instead of mechanization	Cattle ploughing
	Increase in crop productivity by improved farming techniques; Diversification of crops	Soil preparation and improvement
		Introduction of new varieties
Better use of lowland for cropping in rainy season	Promotion of rice cultivation	
Addition of higher value to products	Better use of excessive products; Improvement of transport efficiency	Treatment and processing for postharvest
		Transportation of farm products
Diversification of income source	Increase in income by introduction of improved strain (pig farming) and improved techniques; Introduction of industries to utilize local resources to guarantee other income sources than agriculture	Promotion of animal husbandry
		Aquaculture and fish processing
		Bee keeping

(3) Improvement of living environment (including improvement of public facilities)

Improvement of living environment as well as livelihood should be promoted for community development. It is desirable to begin with simple and familiar activities which can be implemented

without much fund such as improvement of cooking stoves and small-scale handicraft.

On the other hand, some activities of improvement of living environment are difficult to be done by single village. Field survey revealed that health centers and schools are shared among several villages which are formed as “zone”. As shown in the table below, zones will be in charge of improvement of public facilities together with establishment of better system of maintenance of facilities by the villagers. However, this public facilities improvement is regarded as a medium-term issue, because it requires improvement or construction of a management system of the facilities by residents; and therefore, it is difficult to solve the problem within a short-term.

Table 5.5 Issues and measures related to improvement of living environment

Item	Issues	Measures	Responsible
Improvement of living circumstance	Activities to improve mainly the living circumstance of women	Improvement of cooking stoves and housekeeping	Village
		Literacy education and bookkeeping	
		Handicraft	
Disposal of garbage found in most noticeable places as an activity to maintain clean village	Reuse of plastic bags		
	Introduction of techniques for conservation of remaining forest and reforestation (preparation of seedlings, transplantation, etc.); Introduction of new usage of currently undervalued tree species such as moringa	Forestry preservation and replantation	
Conservation of natural environment		Moringa tree	
		Roadside trees	
Improvement of public facilities	System and method of maintenance of facilities by the residents after simple rehabilitation of existing facilities	Improvement of health facilities	Zone
		Maintenance and management of drinking water facilities	
		Improvement of educational facilities	

5.1.3 Implementation System

Residents’ initiative for implementation and extension of development plans is quite important for sustainable development of communities. Assistance and management given by public services are also required although they show certain weakness. Basic concept is to utilize existing organizations and public services in the communities, avoiding to the extent possible making new organizations. Basically, communities are expected to lead planning, implementation, operation and maintenance of the development activities with instructions provided by related sectors of public services in the Study Area.

Each village in the Study Area already has its organization (village development committee), but there is not any organization formed by residents to cover the whole area. The present community development plan proposes, as mentioned above, activities of different contents which could be done by single village as well as by several villages. Activities like improvement of agricultural productivity can be implemented by individuals or groups formed by villagers and do not have much relation with other villages. By contrast, operation and maintenance of such facilities as road and school should be

responsibility of several villages where the beneficiaries live in. Therefore, implementation system should be structured in accordance with the contents of the activities.

The Study Area can be divided into the villages along Kilueka route and the villages along Nkondo route, which are two independent routes without influencing each other. Villages of each route (10 villages along Kilueka route and 11 villages along Nkondo route) are expected to establish a committee (community development committee) which would have function of 1) providing management and instruction for the activities implemented at route level, and, 2) providing indirect management and instruction for the activities implemented at village level. The village development committee stated above should be responsible for management and giving instructions for village level activities. In addition, it is expected that community development committees exchange information one another on the contents and situation of the village level activities, and also serve as access point to public services in case of any problem.

5.2 Process from Implementation of Pilot Projects to Formulation of Community Development Plan

Contents of the PPs in this Study are determined based on the development potentials and constraints of the Study Area. Particular issues to be verified through PPs can be related to the major issues of community development of the DRC as follows:

- ✓ Poverty alleviation: Improvement of agricultural productivity, Improvement of livelihood by diversification of income source, etc.
- ✓ Residents' participation in the selection, implementation and monitoring of development projects
- ✓ Development of regional leaders: Development of leaders of groups, villagers, unions, etc.
- ✓ Improvement of living environment in rural area: Saving fuel wood (improved cooking stoves), reforestation, development of health promoters, etc.
- ✓ Reinforcement of collaborative framework among central, provincial and district governments as well as local administrative agencies

PPs implemented in line with above issues are reflected in the community development plan through confirmation of the effects and verification of the contents of the projects, target year of the development, implementation system, etc.

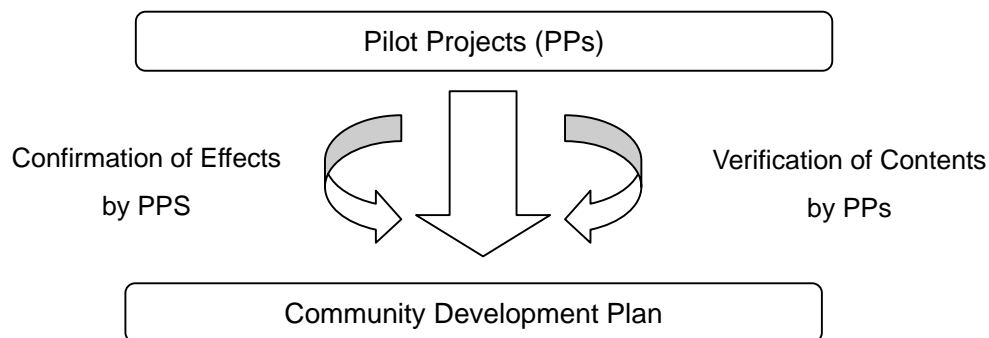


Figure 5.3 Relationships between PPs and community development plan

5.2.1 Confirmation of Effects by Implementation of Pilot Projects

The following aspects such as improvement of livelihood and technical contents are verified by implementation of PPs:

Improvement of livelihood: Through the PPs of improvement of agricultural productivity (cattle ploughing, introduction of new varieties, rice cultivation), addition of higher value to agricultural produce and diversification of income source, the expected improvement of livelihood is evaluated including the initial input by the Study Team.

Technical review: Implementation of the PPs of cattle ploughing, vegetable cultivation (soil preparation and improvement and introduction of new varieties), rice cultivation, animal husbandry, aquaculture and beekeeping is subject to natural conditions such as topographic limitations and also contains technical aspect like structure of pigsty. Accordingly, the evaluation is undertaken from technical point of view including not only results of the PPs but also initial conditions as well as their process. Finally, technical manuals of crop farming and livestock farming applicable to the Study Area's conditions will be prepared.

Activity by groups: Each PP is implemented by group of willing participants as basic unit. In addition to this, existing organizations in the village and newly established organizations among several villages provide management and instruction for PPs. Different responsibilities of each organization should be made clear and the capacity building of these organizations through PPs will begin with development of human resources to take leadership.

Collaboration among villages: Apart from the activities at single village level, rehabilitation of schools and health centers which needs collaboration of several villages is implemented as PP. The village where the target facility is located should play principal role during the implementation: however, the process is monitored from the standpoint of shared responsibility of the maintenance by all the villages which use the facility.

5.2.2 Verification of Contents of the Community Development Plan

As for the contents of the community development plan, their sustainability and feasibility of dissemination among residents (including other villages) should be clarified in the verification process.

Implementation procedure: Procedure from planning by the residents to implementation and monitoring of projects is verified to ensure the continuity of the projects.

Target year of the development plan is established based on the

contents of programs and projects as well as the priority and necessity given by the residents.

Dissemination effect: Degree of dissemination (extension) of PPs among residents is verified to be fed back into efficient planning of project implementation.

5.2.3 Verification of Securing Management and Maintenance Expense by the Pilot Projects

As described in the 5.1.3, sustainability of community development led by the residents is expected to be ensured under this proposed system. However, fund for operation and maintenance is also necessary for sustainable development. The following costs are supposed for operation and maintenance:

- ✓ Maintenance cost of rehabilitated roads by quick impact project;
- ✓ Maintenance cost of public facilities such as health centers and schools.

Contribution by the communities to cover part of these costs should be an alternative due to the weakness of public services. PPs implemented in this Study include the component of livelihood improvement, and its costs are basically borne by the residents. Utilization of the repaid fund in this component also should be determined.

Maintenance cost of road

Constant maintenance is indispensable to maintain good condition of the road paved with laterite and lined with earth channel. Maintenance cost of the road should basically be borne by the beneficiaries, and the following alternatives will be studied to determine adequate way of collection:

- ✓ To collect transport charge from the cars which use the road of target communities;
- ✓ To raise the rent for land by reason of improved accessibility brought by this project, and collect the added portion of the rent;
- ✓ To collect contribution from the residents.

Maintenance cost of public facilities such as health center and school

School fee is actually collected including the cost of maintenance: however, the amount is not sufficient to carry out even simple repairs. Maintenance cost of public facilities which do not create immediate direct benefit could be covered by such alternatives as collection of contribution from wide range of users and utilization of the income gained from farmyard which is prepared for this specific purpose.

Pilot Project for livelihood improvement

Cost of implementation of the PPs for livelihood improvement is basically borne by the residents, who in turn must pay back their temporal debt to the Study Team through the activities of

PPs.

Community development committee should be responsible for the collection and disbursement of related funds, and the capacity development of the members will be promoted through opening of bank account in the name of the committee, training on book keeping, etc. As for the flow of the fund, especially the deposit and withdrawal of the account's money, it is important to establish a system which allows the supervision by sector chief as well as the mechanism of internal check within the committee.

Chapter 6 Pilot Projects

6.1 Implementation Policy of Pilot Projects

Pilot projects (hereinafter referred to as PPs) were implemented based on the concept of community development plan. This Study carried out PPs that included 1) establishment of the community development committee in the Study Area (see Section 6.2), 2) road maintenance under the initiative of the community development committee (see Section 6.3), and 3) implementation of a PP related to the development of the community along the improved road (see Sections 6.4 and 6.5). Additionally, project evaluation of PPs implemented under this Study and examination of monitoring systems were also conducted (see Sections 6.6 and 6.7).

While granting the importance of technical verification of PPs and priority validation of PPs based on the villagers' needs, it is as important to validate whether the villagers are potentially capable of continuously implementing the PPs described in this chapter. As it is evident in the organization of this chapter, it is also one of the main objectives of PPs under this Study to test the activities of the community development committee established in the Study Area.

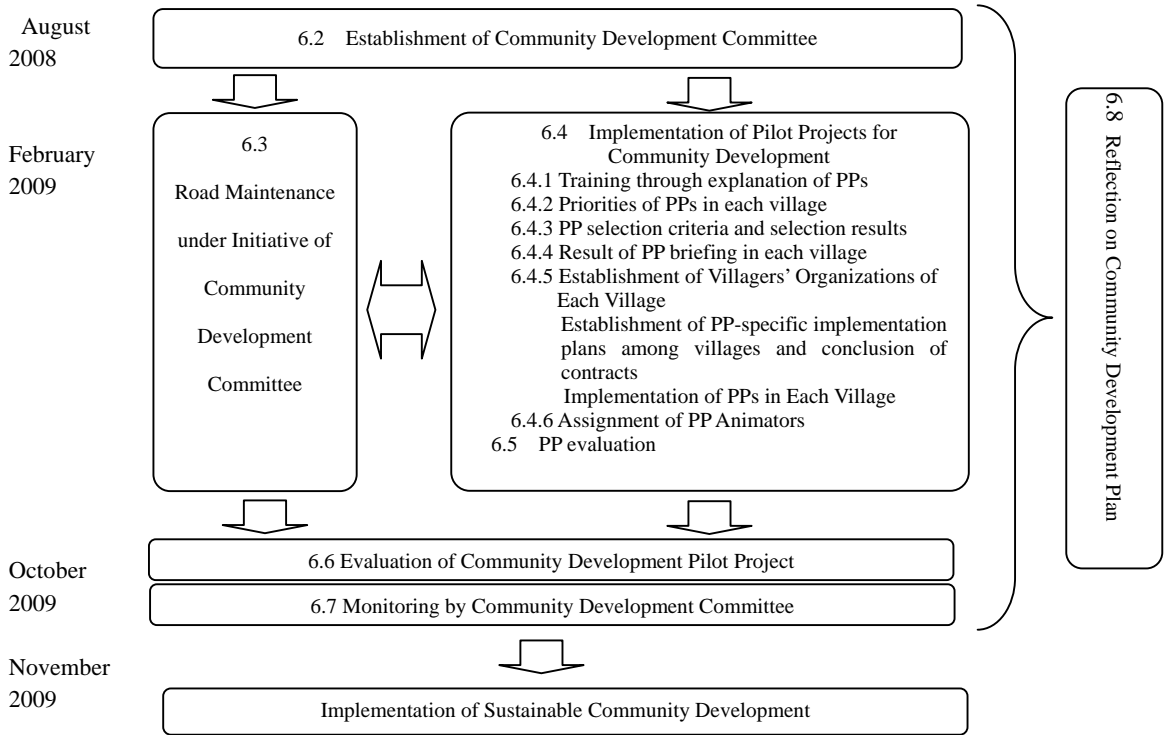


Figure 6.1 Flow of implementing pilot projects

6.2 Establishment of Community Development Committee in the Study Area

The Study Area has a provincial road that runs from Kimpese to the Nkondo Site in the northwest and a community road that runs from Kimpese to the Kilueka Site in the northeast. Since these roads are means of access for the residents of several villages to public services such as markets,

schools, and dispensaries in this area, the surrounding area of these roads can be regarded as one community. Additionally, it is a custom in this area that a tribal chief has an important initiative on the development plan for the entire community including child and grandchild villages that belongs to a parent village. The scope of a community was considered in conformity with this relationship between parent, child, and grandchild villages. Figure 6.2 shows the traffic of community residents for access to markets and public services and the relationship between parent and child villages.

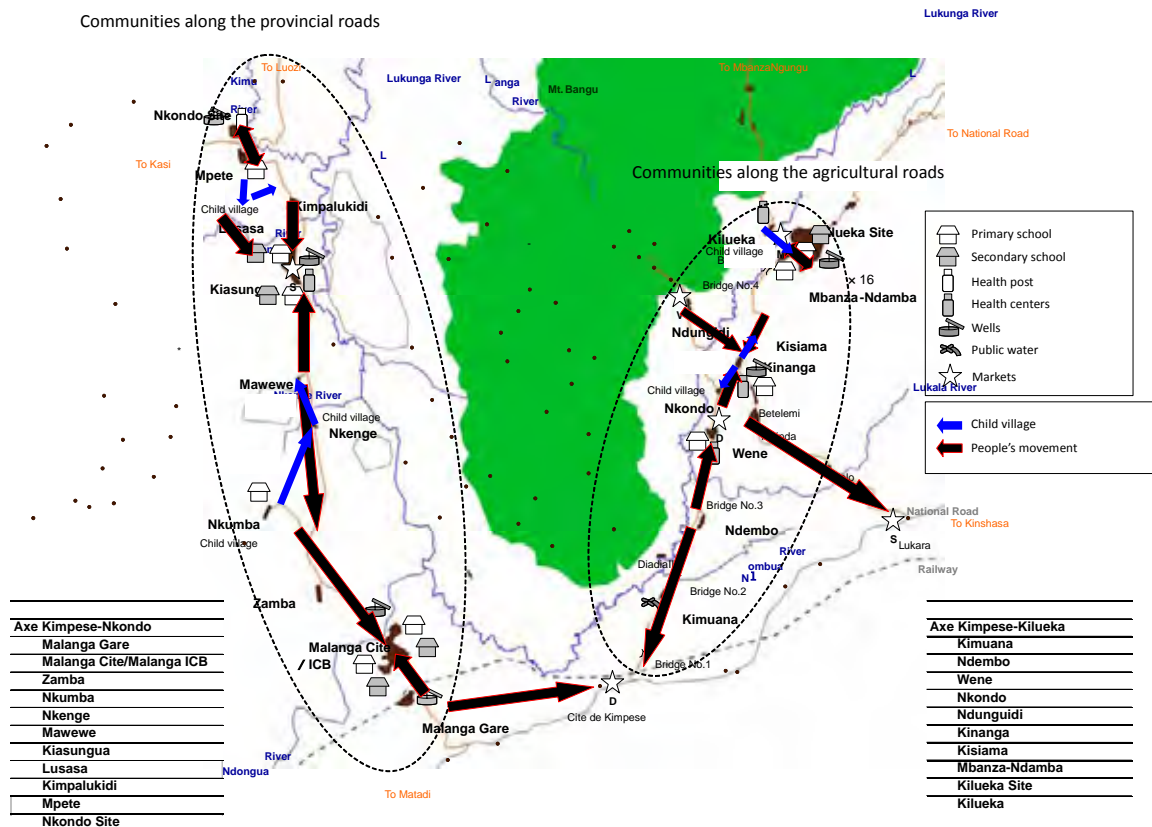


Figure 6.2 Scope of community in view of roads and traffic of villagers

In view of such characteristics of the Study Area, two community development committees were established to cover the two routes, each consisting of representatives of 10 villages along the Kilueka route and representatives of 11 villages along the Nkondo route. The community development committee consisting of representatives of 10 villages along the Kilueka route is called Lukunga Valley Development Committee I, and the community development committee consisting of representatives of 11 villages along the Nkondo route is called Lukunga Valley Development Committee II. The procedure of establishing these committees and the details of enhancement training for the committees are described in Annex 6.1.

6.3 Road Maintenance under Initiative of Community Development Committee

Maintenance of roads must be performed to keep them in good condition and to ensure lasting

effects of development. Therefore, this activity was introduced as a mandatory process regardless of the villagers' priority, unlike other PPs. However, the Nkondo route was improved by the assistance of BTC in 2005, and then CLER was established as a maintenance system. Since this framework continues to be utilized, this project was mainly implemented on the Kilueka route. The scope of this project included Establishment of a maintenance system led by the community development committee, road maintenance training and fostering of managers, the details of which are described in the following. At present, all the items have been completed for the Kilueka route and, for the Nkondo route, Item has been implemented and Item is to be implemented by other donor.

1) Establishment of a maintenance system

Construction of maintenance system: Establishment of a work system by the road maintenance organization, supervision of maintenance activities, enhancement of technical support (by committee members, collaborators: sector, committee, CCSO, etc.)

Distribution of maintenance tools

Securing of road maintenance activity budget

2) Fostering of managers and implementation of maintenance training

Supervisor training (April and October 2009)

Maintenance training to villagers (October 2009)

PPs regarding road maintenance implemented for each route are described below.

(1) Establishment of a maintenance system

1) Construction of a maintenance system

The community road requires the following two types of maintenance work:

Periodical (Périodique): Large-scale repair works conducted once every several years regarding road erosion, etc.

Daily (Courant): Road cleaning and small scale road repairs, etc. conducted daily

Periodical maintenance is the responsibility of a road supervisor in the administration. The Kilueka route is under the jurisdiction of DVDA Bas Congo and the Nkondo route is under the jurisdiction of the Office de Route (O.R) Matadi.

Daily maintenance of the Nkondo route should be conducted basically using the framework of a maintenance program that CLER founded by CTB will implement for three years from December 2009. For the Kilueka route, a maintenance system has been established consisting mainly of committee members as well as managers elected from each of the settlements and villagers. The table below shows the organizations and persons in charge of periodical and daily maintenance of the two routes. As described in Chapter 5 on the organization, cooperation will be obtained from the sectors as

the supervisors of the activities and from the CCSO and DVDA as the providers of technical support.

Table 6.1 Maintenance system for the two routes

Route	Regulating authority	Maintenance activities		Support and guidance	
		Periodical (Périodique)	Daily (Courrant)	Activities in general	Technical matter
Kilueka route	D.V.D.A	• D.V.D.A Bas-Congo	(a) Supervisors of settlements (b) Salongo, etc. - All members of settlements, about once a month	Sector	• CCSO • DVDA
Nkondo route*	O.R.	• O.R. • CLER Kiasungua (CTB assistance)	(a) Supervisors of settlements (b) CLER Kiasungua	Sector	• DVDA

* The above system for the Nkondo route is an existing framework, which was not introduced in this project.

(a) Maintenance method (Kilueka route)

The maintenance method for the Kilueka route is as follows:

Maintenance work is conducted by the road maintenance organization that consists mainly of the committee.

Each of the nine villages except Ndunguidi is in charge of the maintenance of one of two-kilometer blocks of the road divided from the starting point in Kimpese.

Ndunguidi, being 5.0 kilometers away from the community road, is in charge of the maintenance of the feeder road from the village to the Kilueka route.

Three road supervisors (Cantonniers) are appointed from every village. Managers are villagers who have received training. When selecting managers, educated persons with some position in the village should be given priority because they must play a leading role in the village regarding road maintenance.

Three managers (Capitas) are selected from the road managers to supervise the activities of the managers.

Each road supervisor patrols the relevant section (2.0 kilometers) once in a week (a total of three times per village). The work consists of removal of dirt from the gutters, simple repair of pavement, traffic restriction in the rainy season (installation of road blocking devices during rain at four locations along the route), and cleaning of the road vicinity. After the work, the supervisor submits a report to his/her manager.

Each manager is in charge of six kilometers and check the road conditions and the supervisors' work conditions once a week. If the conditions are not satisfactory, the manager reports to the supervisors and Duki, and tells them to redo the work.

Villagers are divided into four groups, each of which carries out maintenance work once in a month (through salongo).

Technical support is provided to the road supervisors, managers, and villagers by the CCSO and DVDA staff. The CCSO and DVDA staff patrol the road once in a month.

(2) Distribution of maintenance tools

One set of road maintenance tools was distributed to each settlement. Unlike a PP, road maintenance does not directly yield profit. However, unless road maintenance is performed periodically, the road quickly loses its value and causes negative influence to other activities. Therefore, maintenance tools were distributed free of charge and no deposit was demanded. The usage conditions of tools are watched by the sector, and any stolen or broken tool must be supplemented under the responsibility of the village. A list of distributed tools is shown in Annex 6.2.

(3) Securing of road maintenance activity budget

1) Budget required for maintenance

After the establishment of CLER, wages are actually paid to the employed supervisors and managers. However, the source of funds is almost entirely the assistance from the donor so that the payment tends to be delayed. In fact, CLER Kiasunugua, which is in charge of maintenance of the Nkondo route, is partly in arrears with the payment of wages to supervisors, etc.

In view of these circumstances, an organization for the maintenance of the Kilueka route was formed within the committee instead of establishing a CLER. As of October 2009, the budget for paying wages to supervisors and managers is not secured. However, securing of budget described in the next section is in preparation for the sake of securing incentives for supervisors.

Therefore, it was explained to the managers and supervisors that the payment would be temporarily suspended until the budget was secured, and obtained their approval for it. The following lists standard wage amounts in CLER in Bas Congo, which need not to be paid in full. It was also proposed to pay with food such as cassava. In addition to the payment to the supervisors, etc., the budget for simple road repair needs to be secured.

* Example of payment to managers, etc.

* Superviros : US\$3 per day x 3 persons per village x 10 villages x 4 weeks = US\$360

* Managers : US\$5 per day x 3 persons per route x 4 weeks = US\$60

Total : US\$420 per month x 12 months = US\$5,040 per year

2) Attempt to secure maintenance budget

As described in Chapter 5, means for securing the maintenance budget under examination are (a) collection of tolls from passing vehicles and (b) collection through addition to rents. These collected amounts will be used by the committee as the road maintenance budget.

(a) Collection of tolls from passing vehicles

In this project, it is planned to restrict the passage of vehicles during rain by installing road blocking devices at a total of four locations in the entrances to the route and the branch road. At two of

the locations with high traffic, tolls are collected from passing vehicles. The operation is to be managed by the Congo Drivers Association (ACCO), and 70% of the collected amount is returned as the maintenance budget to the community development committee. The following table lists the agreements reached by October 2009.

Operation	Managed by ACCO. The costs required to collect tolls are covered by ACCO.
Collected amounts	500FC for sedan types, 2,000FC for buses and pickup trucks, 3,000FC for trucks
Shares of collected amounts	The committee takes 70% and ACCO takes 30% of the collected tolls.
Payment of share	Every month at the sector office in the presence of a sector representative, the shared amount is paid by ACCO to the committee.
Start time	Started as soon as the agreement is signed by ACCO and the committee after the completion of the improvement work.

(b) Collection through addition to rents

Most of the farmlands along the Kilueka route is owned by landowners of villages and rented by the Kimpese residents and villagers. With the consent of these landowners, it was decided to collect a certain amount added to rents and give this amount to the committee. The following table lists the agreements reached with the landowners by October 2009.

Collected amount	The Kimpese villagers generally pay 5,000 to 6,000FC per block in every season, which is increased by 20%. This amount is collected in every season. Since there are tenants also in the villages, US\$5 is collected from each village every month.
Collection procedure	i) The number of tenants in each sector is checked every season. A list of tenants is made. ii) Based on the list, the landowner collects rents. iii) In the presence of the sector personnel, an amount added to the collected amount is given to the committee.
Start time	Collection started after survey by the sector in accordance with the busy farming season (November and December).
Problem	Whether the maintenance cost can be covered is uncertain because the number of users is not yet found and the amount of US\$5 per village is not a sufficient amount. It may become necessary in the future to take a measure such as raising the amount to be collected.

(4) Fostering of supervisors and supply of road maintenance training

As describe earlier, daily maintenance will be implemented mainly by the villagers' organization in the current system. Even at present, the villagers including selected supervisors and managers are performing brief maintenance work on the roads near their settlements through salongo, with ineffective results due to lack of technical background.

To ensure that the villagers carry out maintenance of the road for themselves sustainably, it is important to raise the villagers' awareness of the road maintenance work and provide assistance in their technology acquisition. This PP deepened their understanding of the maintenance work through supply of educational activities and maintenance training to them. Annex 6.3 shows the programs from the first year.

6.4 Implementation of Pilot Projects for Community Development

PPs were conducted mainly to verify the relevance and effectiveness of PPs proposed based on the concept of the community development plan. Since PPs are based on resident participation, the Study Team provided training in Kimpese, made visits to villages to inform the details of PPs, and

promoted the identification of priorities of PPs to villages. Paying particular attention to the implementation system and the fund management system so that beneficiaries would become PP implementers voluntarily, PPs were implemented after the action plan for these items are submitted by the villagers. The Study Team did not compel the villagers to form a villagers' organization but encouraged those who understood and took interest in the purpose of a PP to form a group on their own initiative after presenting the implementation conditions. To ensure satisfaction of implementation conditions such as the repayment of project expenses to the community development committee, the three parties, i.e., the target group, the members of the community development committee and the village chief who was a representative of the village development committee, and the Study Team signed a contract and obtained approval from the Kimpese sector. Besides, the Study Team is encouraging to continue, after completion of the PPs in the current Study, community development activities based on similar contracts signed by relevant parties, even without guidance of the Study Team. The table below shows the specific procedure for implementing PPs.

Table 6.2 Pilot project implementation procedure

Period	Section number	Description
Late February to mid-March 2009	6.4.1	Training for briefing of PPs (Training in Kimpese in which one man and one woman from each village participated)
Late March 2009	6.4.2	Priorities of PPs in each village (Discussing project priorities in each village, reasons for the priorities, and persons in charge and filling out priority questionnaire)
Late March 2009	6.4.3	PP selection criteria and selection results (Selecting PPs to be implemented based on the selection criteria)
Early April 2009	6.4.4	Result of PP briefing in each village (Holding route-specific meetings of village chiefs and then holding PP briefing session in each village)
Mid-April 2009 and thereafter	6.4.5	Establishment of villagers' organizations of each villages
Mid-April 2009 and thereafter	-	Establishment of PP-specific implementation plans among villages and conclusion of contracts (An implementation plan included a member list, internal regulations, activity plans, and outputs and purposes.)
Mid-April 2009 and thereafter	-	Implementation of PPs in each village
Mid-May 2009 and thereafter	6.4.6	Assignment of PP animators
Mid-October 2009 and thereafter	-	PP evaluation meetings

The section numbers indicated for the descriptions correspond to the section numbers of the following sections.

6.4.1 Training for Briefing of Pilot Projects

As described in the concept of the community development plan, PP plans were prepared by extracting and analyzing development potentials and constraints from the problems and needs of villages and through comprehensive judgment. In order to ensure that the villagers understand the concepts of PPs, the first training was provided in Kimpese in February and March 2009, explaining the projects to the villagers consisting of one man and one woman from each village. Annex 6.4 shows the schedule of training for briefing of projects and instructors for this training.

Although it was initially planned to select different villagers by project items so that the persons well-informed for each of them could attend the training, it was actually the same persons who attended for four days in late February and five days in mid-March in order to alleviate burdens on the villages in the rainy season when movement was difficult. This is because, when a village chief meeting was held on February 23 (Monday) to explain the purposes and content of training in Kimpese and request them for the dispatch of appropriate persons, it was agreed that the content of training in Kimpese would be better conveyed to the villagers if persons not only well-informed about project items but also good at communications are dispatched for multiple days.

The training covered a wide range of projects mentioned in the concept of the community development plan but did not include all of them. For example, the "rehabilitation of feeder roads PP" was not covered in the training in this period because the implementation method varied depending on the rehabilitation budget and schedule possibilities although the necessity of rehabilitation was recognized. For more information on the "rehabilitation of feeder roads PP" and the "simple road maintenance PP," refer to the classroom lecture described later and the maintenance training on site. The training in Kimpese covered the matters that could be implemented by any interested villager and could be voluntarily implemented even in villages or by residents not selected for PPs as long as the budget or schedule could be met.

The local resources were made the most of when selecting training instructors. Regarding the training about public facilities, in particular, resource persons of the public sector were requested to deliver lectures, which included the identification of the status quo, specific proposals for repair, enhancement, and improvement methods, possibilities of future implementations, and what could be done by the villagers themselves at present. The collaboration with such resource persons of the public sector in relation to the establishment of a draft community development plan, examination of the project contents, examination of PPs to be implemented in this Study, and proposal of projects to be implemented with priority was also intended to enhance the feasibility of the community development plan to be established in the end. For example, Mr. Pierre Nsumbu Muntu Kalavo, the Kimpese educational zone chief, was requested for collaboration regarding improvement and maintenance of school facilities and assistance at small private school (terakoya) for enhancing the education of early primary school students. Likewise, Dr. Lukanu Ngwala Philippe, a representative of the Ministry of Health in Kimpese zone, was requested for collaboration regarding improvement and maintenance of medical facilities, status quo and activities of community health promoters in the villages, improvement of drinking water environments through renovation and maintenance of wells and development of spring water.

A certificate of completion awarded to the participants at the end of this training seemed to serve as a source of encouragement for their future activities. The participants of this training were expected not only to acquire new knowledge through training but also to convey the information to other villagers when they went back to their villages. The participants seemed to share the awareness that

persons who had obtained a certificate of completion had such a role. Additionally, many of the female trainees who had not had opportunities to go out of their villages, the participation in this training seemed to have such side benefits as seeing the Kimpese town, getting acquaintance with other trainees, and knowing how it was in other villages. The answers to the questionnaire survey included many comments that the participants were glad to have participated in this training and many opinions that they would actually put the learning into practice when they got back to their villages. There were also opinions that, even though it might be difficult for the participants themselves to put the learning into practice due to the land conditions, family circumstances, etc., they would like to actively encourage the activities for other villagers to do so if possible and join such groups themselves.

6.4.2 Priorities of Pilot Projects in Each Village

Priority questionnaire sheets in which the respondents filled out the project priorities, reasons for the priorities, and persons in charge were collected from the villages along the Nkondo route on March 24 (Tuesday) and the villages along the Kilueka route on March 25 (Wednesday) in 2009 (See Annex 6.5 for the questionnaire results). They were required to fill out down to 5th priority from the top.

For those PPs regarded important not as economic activities but for their environmental and social significances are intended to be implemented in all the villages, the respondents were asked to leave the priority blank and write only the person in charge. These PPs include "forestry preservation and replantation PP," "roadside trees PP," and "reuse of plastic bags PP."

The table 6.3 and 6.4 shows the results. The answers regarding projects with lower priorities than the top six are not reflected in the table. The animal husbandry PP is in the top five in priority in almost all the villages. The demand for the cattle ploughing PP is the next highest, being in the top five in priority in 13 of the 21 villages.

6.4.3 Pilot Project Selection Criteria and Selection Results

In view of the above circumstances, PPs to be implemented were selected according to the following criteria:

- (1) Respecting priorities given by the villages as much as possible

A PP given a high priority by the villagers is considered to be in high demand by the Study them and is expected to receive active resident participation when it is implemented. To begin with, community development is not performed by the Study Team but by the local residents. Projects that are likely to conform to this implementation policy were selected, respecting the will of villagers as much as possible.

- (2) Giving priority to effective use of the existing facilities

For example, no new well was dug in a village where there was already a pump well. Decisions on repair assistance for health centers were made not based on their locations but in consideration of beneficiaries, by considering whether effects for villagers living in the vicinity can be expected.

(3) Adding the Study Team's proposals in view of resources owned by the villages

Sometimes, villagers themselves do not recognize the resources owned by the villages. The Study Team pursued the examination of implementation of projects that could put such resources to effective use.

(4) Avoiding similar PPs in one zone and pursuing dissemination from the initial stage

If a similar request is made by villages in the vicinity, a PP was implemented in the demonstration village in pursuit of dissemination to these villages, instead of implementing a PP equally in all of them. For example, instead of implementing an animal husbandry PP in all the villages, we arranged a system in which improved pigs were spread from the PP-implementing village to other villages in the vicinity in pursuit of dissemination in the entire area in the future.

We actively pursued the implementation of PPs that was expected to be beneficial not only to the implementing village but also to the villages in the vicinity.

(5) Giving considerations to the balance between villages regarding the numbers of projects to be implemented

Finally the balance between villages were adjusted to ensure that the implementation of PPs was neither concentrated nor too few in part of the villages. The PP selection results based on the above selection criteria for the villages along the Kilueka route are shown in Table 6.3 and those for the villages along the Nkondo route in Table 6.4.

Table 6.3 Pilot projects selected by the villages along the Kilueka route

PP name	Village name										Total
	Kimwana	Ndembo	Wene	Ndunguidi	Nkondo	Kinanga	Kisiana	Mbanza Ndamba	Kilueka	Kilueka Site	
Cattle ploughing	7	01	04			01	2	02	01		Five villages
Soil preparation and improvement	08	0	0	0	0	0	0	0	0	0	A total of 20 villages (Implemented by Agrisud. Second community field in 9 villages except in Kilueka Site. In Kilueka Site, a new community field was established.)
Introduction of new varieties	014	0	0	0	0	0	4	0	0	0	
Promotion of rice cultivation	01						3				1 village
Treatment and processing for postharvest	09										1 village
Transportation of farm products	010	0	0	0	0	0	011	0	0	0	20 villages in total
Animal husbandry	3	2	5	01	01	2	01	4	2	05	4 villages
Aquaculture and fish processing	6							6	03		1 village
Beekeeping				06		8		7			1 village
Forestry preservation and replantation*	0	0	0	0	0	0	0	0	0	0	20 villages in total (Also providing assistance for seedling raising to 3 villages.)
Moringa tree (water purification)	13	03		03	02		10				3 villages
Roadside trees*	0	0	0	0	0	0	0	0	0	0	20 villages in total
Improvement of cooking stoves and housekeeping	02				08			0			3 villages
Literacy education and book keeping	5	04	7	04	05	6	8	03		03	5 villages
Handicraft						07					1 village
Reuse of plastic bags*	0	0	0	0	0	0	0	0	0	0	20 villages in total
Leisure activities	04	05	06	02	03	05	06	05	04	04	20 villages in total (Assistance was actively provided in 4 villages.)
Improvement of health facilities	11		3		4	04	9		05	2	2 facilities
Maintenance and management of drinking water facilities			01	05	7		05	8		01	New wells constructed in Wene and Kisiana Maintenance assistance in Kilueka Site (Depends on the future maintenance plan.)
Improvement of educational facilities	12		02		6	03	7	01			3 facilities

0: PP-implementing village, Number: Priority (e.g., 1 represents a top-priority project selected in the questionnaire sheets from each village)

Table 6.4 Pilot projects selected by the villages along the Nkondo route

PP name	Village name											Total
	Malanga Gare	Malanga Cité	Zamba	Nkumba	Nkenge	Mawewe	Kiasungua	Lusasa	Kimpalukidi	Mpete	Nkondo Site	
Cattle ploughing				2	01	01	01	2		3	01	4 villages
Soil preparation and improvement	01	0	0	0	0	0	0	0	0	0	0	21 villages in total (Implemented by Agrisud. A new community field was established.)
Introduction of new varieties	02	0	0	04	03	04	05	03	01	04	03	
Promotion of rice cultivation												None
Treatment and processing for postharvest				0								1 village
Transportation of farm products	0	02	0	03	0	03	0	0	0	0	0	21 villages in total
Animal husbandry	3	01	01	01	2	2	2	01	2	01	2	5 villages
Aquaculture and fish processing	4	5	02						6			1 village
Beekeeping							06					1 village
Forestry preservation and replantation*	0	0	0	0	0	0	0	0	0	0	0	21 villages in total (Also providing assistance for seedling raising to 4 villages)
Moringa tree (water purification)	05				05		04				0	4 villages (Including effective use of existing resources of Nkondo Site)
Roadside trees*	0	0	0	0	0	0	0	0	0	0	0	21 villages in total
Improvement of cooking stoves and housekeeping	0						0		03	0		4 villages
Literacy education and book keeping							03				04	2 villages
Handicraft											07	1 village
Reuse of plastic bags*	0	0	0	0	0	0	0	0	0	0	0	21 villages in total
Leisure activities	0	0	03	0	0	0	0	05	04	02	06	21 villages in total (Actively providing assistance in 3 villages)
Improvement of health facilities		03		5			0		5		05	3 facilities
Maintenance and management of drinking water facilities		04	04		04	05		04				Digging new wells in Nkenge and Mawewe. Improving the second pump in Malanga Cité. (Depends on the future maintenance plan.)
Improvement of educational facilities			05							05		2 facilities

0: PP-implementing village, Number: Priority (e.g., 1 represents a top-priority project selected in the questionnaire sheets from each village)

6.4.4 Result of Pilot Project Briefing in Each Village

To reach a consensus about the above selection results in the villages, village chief meetings and briefing meetings for villagers were held according to the schedule shown in Annex 6.4. Although priority questionnaire sheets had been filled out at the villages, not all the listed projects were implemented during the Study period. Therefore, selection reasons were explained for selected projects, and future dissemination plans were explained for unselected ones.

This Study is intended to pursue particularly the sustainability and expansion of the scope of projects through capacity development of the community development committee. This intention was explained to foster understanding on the part of villagers. For example, if the cattle ploughing PP is implemented in this Study, the implementing village must repay the initial investment cost to the community development committee. This repayment is then used for dissemination to other villages and expansion to other groups in the same village. After fostering full understanding on the part of the villagers that this PP was implemented on a trial basis and did not represent all the development potentials of this Study Area, we pursued the promotion of making a model in which the villagers and other parties could perform spontaneous development.

6.4.5 Establishment of Villagers' Organizations of Each Project in Villages

As described in [4.1.2 Existing Villagers' Organizations], there are many villagers' organization for each field in the Study Area. For PPs implemented in this Study, we made the most of existing organizations that match project components if any, and attempted to enhance them if any defects are found in the organizations. If required, a manager was selected in accordance with components of a PP, and an organization regarding the component was established. Annex 6.6 shows a list of them.

1) Points to remember in establishing villagers' organizations

Before PPs are implemented, an even distribution of beneficiaries of the PPs to be implemented was confirmed using lists of members submitted by the villagers' organizations. Based on the member lists, the ages, countries, and clans of the members were checked in a hearing. Many survey items were left unanswered for the member lists of Malanga cité and Kiasungua, areas with large populations. After removing unanswered items from data analysis, the Study Team calculated the average ages of PP participants, ratios of PP participants to the village populations, ratios of women and Angolese to the PP participants, and ratios of members of villages' major clans to the PP participants, the results of which are summarized in Annex 6.7.

Seeing that the average age of PP members in all the villages is about 40 years, it is apparent that the villagers' organizations consist of people in the prime of life. Also, the project participants were widely varying in ages from a 13-year-old girl participating in the literacy education and book keeping project in Mbanza Ndamba to an 80-year-old man participating in the animal husbandry

project in Ndunguidi.

Additionally, the participation of women in PPs was confirmed in all the villages except Wene. The participation of Angolese in PPs was also confirmed in all the villages except Ndunguidi, Malanga gare, Mawewe, and Lusasa where Angolese allegedly did not live and Kiasungua where the nationality data was obtained only for six persons.

Looking at the element of clans in the structure of PP participants, Lusasa and Kimpalukidi were characterized by the general high ratios of certain clans to the organization members while Kimwana, Kilueka, and Nkondo Site had approximately evenly distributed ratios of clans in the group members.

It will be extremely useful to keep track of the tendencies of the above villagers' organizations and the implementation statuses of PPs to find and feed back the points to remember in founding organizations and establishing sustainable community development plans.

2) Assistance in enhancing villagers' organizations of each project

In parallel with the establishment and capacity development training of the community development committee, enhancement training was provided to the villagers' organizations of each project, and internal rules for the organizations were prepared under the initiative of villagers. Annex 6.8 shows the procedures for forming and enhancing organizations and the contents of enhancement training. Annex 6.9 shows the internal regulations of the cattle ploughing project (Kinanga) and the improvement of health facilities project (Nkondo Site).

6.4.6 Assignment of Pilot Project Animators

While multiple PPs are implemented in multiple villages, the PP animators shown in the table below were assigned to each of the zones from early May to promote the implementation of PPs and carry out monitoring. The PP animators who lived in the villages gave advice about the implementation plans established by the villagers' organizations of each of the PPs, identified problems encountered by the villagers, etc. and proposed appropriate PPs, introduced resource persons who could offer technical alleviation of PPs, and gave demonstrations of improved cooking stoves.

Assignment of such PP animators to the villages will actively promote exchange of information between villages, PPs, villagers' organizations of each project, and villagers.

Table 6.5 Assignment of pilot project animators

Route	Village of assignment	Villages under management	PP animator	Zone under charge
Kilueka	Ndembo	Kimwana, Ndembo	M.Roberto Dibindu	Zone 4
	Kinanga	Wene, Nkondo, Ndunguidi, Kinanga, Kisiama	M.J.P.Bakala	Zone 5
	Mbanza Ndamba	Mbanza-Ndamba, Kilueka, Kilueka Site	M.Bela Batantu	Zone 6
Nkondo	Malanga Cité	Malanga Gare, Malanga Cité, Zamba, Nkumba	M.Simon M.Davier	Zone 1
	Mawewe	Nkenge, Mawewe, Kiasungua, Lusasa, Kimpalukidi	M.Matai Muanda	Zone 2
	Nkondo Site	Mpete, Nkondo Site	M.Andre	Zone 3

6.5 Implementation and Results of Pilot Projects in Villages

This section describes the implementation and results of PPs implemented since April 2009.

At the completion of PPs, PP evaluation meetings were held, attended by two or three members from each PP group. At the meetings, the representatives of each group reported the status quo and opinions were exchanged, revealing the autonomy of the group members who considered the methods for collecting and utilizing funds. At the PP evaluation meetings, the questionnaire survey on PPs were conducted on the meeting members (For information on the schedule of project evaluation meetings, see Annex 6.4.).

The purposes, validation items, description, target area, implementation conditions, expected effects, results, and evaluation of PPs, and points to be reflected on the community development plan are summarized in a PP sheet (see Annex 6.10). The purposes are those for implementing this PP based on the current state of the Study Area. The validation items are items validated in this PP. The description summarizes respective implementation items of this PP and shows the implementers and implementation schedules of these items. The target area is a village or a zone consisting of multiple villages in which this PP was implemented or a village in which this PP was assumed to be implemented. The implementation conditions are the conditions under which each target area implemented this PP. In particular, important conditions for the community development committee to continue activities are listed. It is considered that sustainable community development can be achieved if a project is executed to meet these conditions. The expected effects are the effects expected when not only this PP but also a project is implemented. Therefore, the expected results on this PP sheet can be referenced when the same activities are to be done in other area. The results and evaluation of this PP are results and evaluation of the individual PP implemented in this Study in comparison with the villagers' evaluation results. The last part summarizes, based on the above description, the items chosen from the results and evaluation of this PP and reflected on the community development plan.

Additionally, the data about cattle ploughing, rice cultivation, animal husbandry, and replantation is summarized into a manual (Annex 6.11).

6.6 Project Evaluation

Out of those projects implemented as PPs, the following were intended for the sake of livelihood improvement. The benefits of these projects were calculated. The details of the calculation of project effects are described in Annex 6.12.

Project	Increased benefit (dollars)	Overview
Cattle ploughing:	1,950 per pair of oxen	<ul style="list-style-type: none"> The cultivation area per pair of oxen is assumed to be 0.25 ha per day. The actual working period is assumed to be 4 months during the rainy season. From the above, the annual cultivation area per pair of oxen is 21.6 ha. Oxen are assumed to work for 10 years after introduction.
Introduction of new varieties:	706 per 1,500m ²	<ul style="list-style-type: none"> The benefit mainly comes from earlier sales period due to the introduced technology (high nursery bed).

		<ul style="list-style-type: none"> The cultivation area of 1,500 m² is assumed to be the average cultivation area in the dry season.
Promotion of rice cultivation:	3,529 per 2 ha	<ul style="list-style-type: none"> The benefit shown on the left is the one in the second year and later. In the first year, manpower is required to create a paddy field. When the manpower is calculated as a labor cost, the benefit is minus 671 dollars.
Treatment and processing for postharvest:	-	<ul style="list-style-type: none"> Agricultural processed goods are expensive as products when the costs of bottles and labels are considered. Since these goods are made only for personal consumption, no benefit is calculated.
Transportation of farm products:	71 per 1 set	<ul style="list-style-type: none"> The benefit gained using ox-drawn carts was calculated. Farm products were assumed to be transported four times a week in one month in the dry season.
Animal husbandry:	179	<ul style="list-style-type: none"> The initial input of pigs is assumed to be one male and three females. Since a pigsty is assumed to consist of walls and roofs made of locally available materials, only the concrete for floors is calculated as a cost.
Aquaculture:	-	<ul style="list-style-type: none"> Since the aquaculture is performed for personal consumption, no benefit is calculated.
Beekeeping:	398	<ul style="list-style-type: none"> Although beehive boxes and bee-keeper's protective clothing are calculated, bees are assumed not to be bought but collected locally.
Joint collection and shipment:	1,355 per 1,500 m ²	<ul style="list-style-type: none"> The benefit of joint collection is calculated assuming that products are temporarily kept in a storehouse and sold in a season when the prices are raised.

6.7 Monitoring of Pilot Projects

6.7.1 Monitoring System

A monitoring system was constructed through discussion with the sector and the community development committee members in order to ensure the sustainability of projects through the implementation of PPs. In the currently assumed monitoring system, as shown in the figure below, 1) a group that performs activities in a village reports to the village development committee, 2) the reported village development committee reports to the community development committee, and 3) the community development committee opens a general assembly to approve the content of activities. It is also important that advice and guidance on each of the activities are given by the sector staff and the sector chief. The monitoring flow is shown in the following figure:

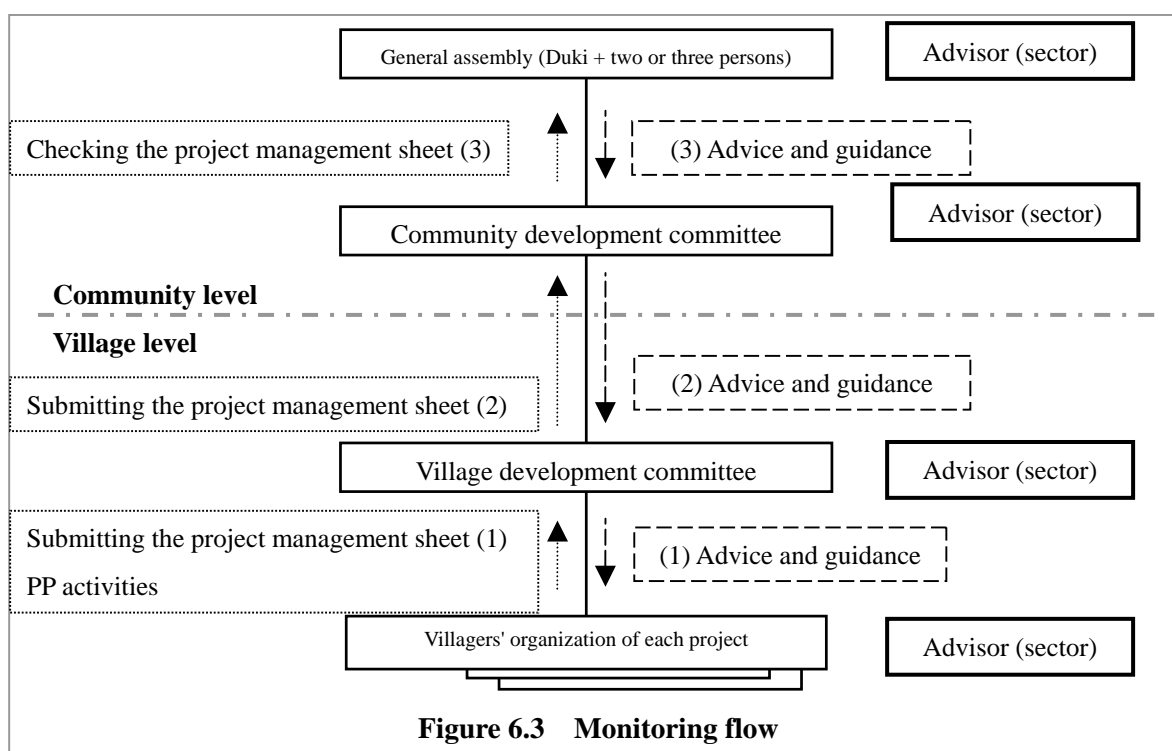


Figure 6.3 Monitoring flow

In the above monitoring flow, reports to be submitted are created regularly using prepared forms, which enable continuous monitoring. On the project management sheet one should record the composition of the village organization, its regulation, action plan, financial management plan, problems and measures. The sheets are also regularly sent to the sector in order that the government manages them. The project management sheet is as shown in the following table:

Table 6.6 Project management sheet

To be filled out by the project group (Implementation plan and monitoring results)	Name of Village				
	Name of Project				
	Date				
	Members	Nom	Sex	Age	Title
		President
		Vice President
		Secretary
		Treasurer
	Regulement Interieur				
	Activities	Activities	Period d'execution (année, mois)	Materials (items, cost)	
		1.	
		2.	
		3.	
Cost	Total Cost : Contribution per group :				
Distribution of profit		Montant prévu (A)	Montant payé (B)	Montant reste (C) = (A) – (B)	
	Profit per group				
	Reimbursement per village committee				
	Reimbursement per Committee of Ndimba Lukunga				
Subject					
Problems					
Plan of resolution of problems					
To be filled out by the village development committee	Commentaires de Committee du Village	Priorité pour nouveau projet	1. Executé plus tot possible 2. Executé dans quelques mois 3. Executé dans une année		
		Commentaires			
	Date				
To be filled out by the community development committee	Commentaires de Committee du Ndimba Lukunga	Priorité pour nouveau projet	1. Executé plus tot possible 2. Executé dans quelques mois 3. Executé dans une année		
		Commentaires			
	Date				
To be filled out by the Kimpese sector	Commentaires de Secteur de Kimpese	1. Accepté 2. Il doit reviseé	Reason		
		Date			

6.7.2 New Projects and Repayments

A group implementing a PP related to livelihood improvement is obliged to pay a deposit before the project start and make annual repayments during the project implementation period.

(1) Repayments from a group

Repayments from a PP, as shown in the figure below, are made to the village development committee, which in turn gives them to the community development committee. The community development committee manages the book and deposits them into an account opened in Kimpese.

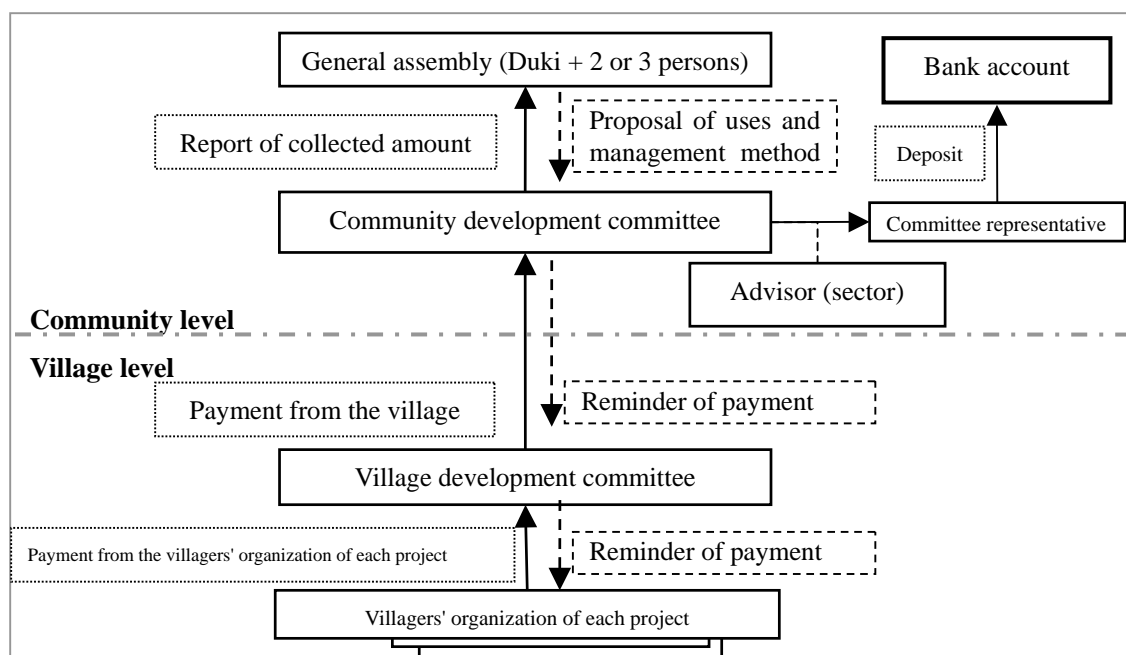


Figure 6.4 Flow of repayments for pilot projects (up to depositing)

(2) Activities of new groups

The above repayments are for the cattle ploughing , introduction of new varieties, animal husbandry, and transportation of farm products. When they are used, new PP group will be selected in the same procedure as for the implementation of PPs.

Repayments are summarized in the following table:

Project	Description of repayment	Repayment period
Cattle ploughing:	First year: 10% of the project cost before start 2nd year and later: 20% of the project cost every year	Every year for 5 years
Introduction of new varieties:	Repayment of the project cost plus 20% interest 6 months later	6 months later
Promotion of rice cultivation:	Return of the same amount of seed rice that has been supplied	After harvest
Transportation of farm products:	First year: 10% of the project cost before start 2nd year and later: 20% of the project cost every year	Every year for 5 years
Animal husbandry:	Return of as many pigs (2 months) as have been supplied when the first baby pigs are born 2nd year and later: 20% of the project cost every year	Every year for 5 years

Repayments are intended to be used for the sustainable project implementation and are defined as follows:

- Introduction of new varieties: The interest can be used for various purposes such as road maintenance and health facility maintenance. However, the principal will be used for seeds in the introduction of new varieties project in the next fiscal year.
- Cattle ploughing, transportation of farm products, and animal husbandry: All the project repayments collected will be used for cattle ploughing because transportation of farm product requires a small investment amount and animal husbandry allows other groups to acquire baby pigs.

(3) Procedure for activities of a new group

As described earlier, repayments are used in the procedure shown in the figure below, in the same way as for implementing PPs. In other words,

- 1) A new group makes an activity plan and submits it to the village development committee.
- 2) The village development committee examines the activity plan and submits it to the community development committee.
- 3) When the plan is adopted, the representative of the community development committee withdraws the budget from the account.

Before the budget is withdrawn from the account, however, it is important that the representative of the community development committee obtains approval from the sector chief.

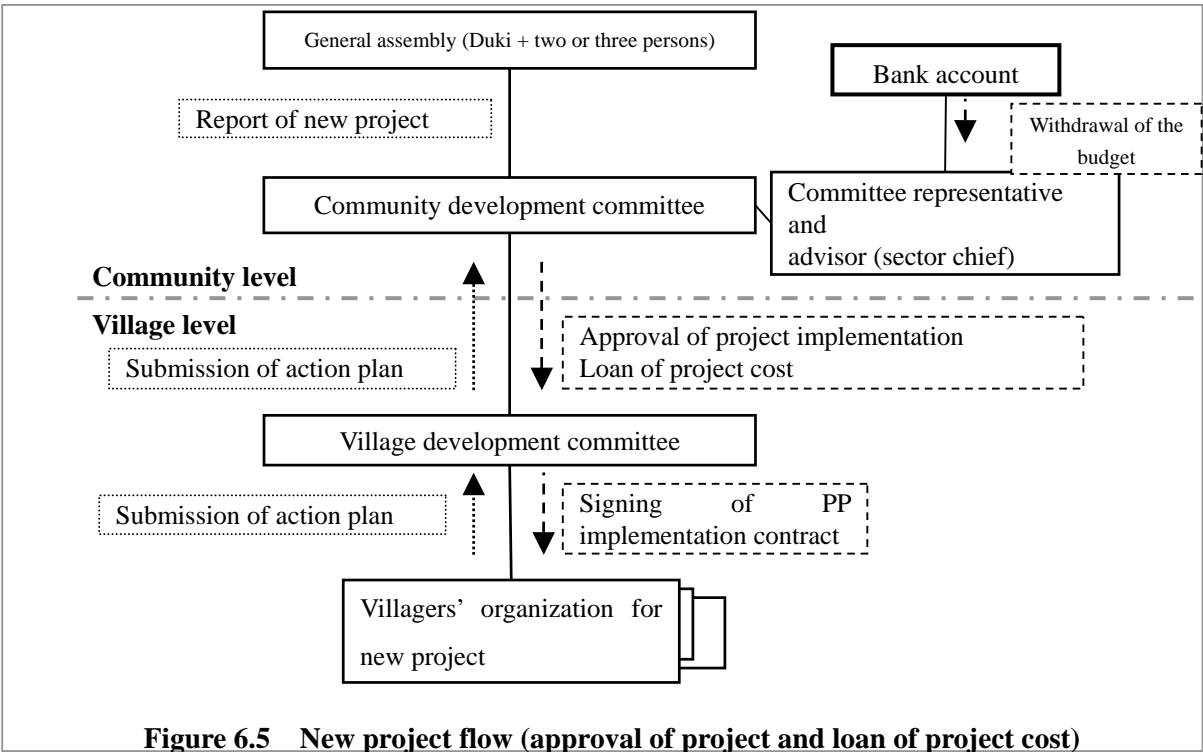


Figure 6.5 New project flow (approval of project and loan of project cost)

6.7.3 Implementation of Monitoring

(1) Monitoring of Pilot Projects Related to Community Development

1) Premises

To implement and expand resident-led community development, the first-year and second-year Study performed resident-led identification of problems in the community and selection of solutions and, based on the result, a community development plan was prepared with special attention to the following items:

The plan must be something that can be implemented under the initiative of villagers.

Human resources and local resources in the target area should be utilized at a maximum.

If a task cannot be handled by individuals, handling of it in an organization (group) is examined.

To make the community development plan more concrete, it is necessary to implement a PP for each item of the community development plan, find tasks for implementing and expanding the development plan through the validation activities, and feed back the result to the development plan.

2) Monitoring items

The items of the community development plan can be divided into the following four major items:

Income increase for local residents

Improvement of living conditions and natural environment

Improvement of administrative services

Organization enhancement by villagers themselves (including the community development committee organized for both the routes)

Through the implementation of PPs in the second-year Study, villagers established action plans in which problems in the target community were identified, and an improvement plan (draft) was prepared in which available the local resources were verified, allowing them to recognize the necessities of the organization. The resident-led activities were started based on a specific implementation plan created in the above process, but many of them have not demonstrated specific effects yet at this stage.

The monitoring items assumed for major projects are as shown in the following tables:

Livelihood improvement programs

Project	Overview	Monitoring items
Cattle ploughing	Aimed at improving productivity through expansion of cultivation area. By the 2nd year, it is planned to complete the ox training and start preparing for rainy season cultivation (plowing work) in October. In the 1st year after training, the daily plowing area is assumed to be 0.10 ha.	<ul style="list-style-type: none"> - Change of cultivation area and crop yield due to cattle ploughing - Relevance and sustainability of group-based operation system
Animal husbandry promotion	Excellent breeds of pigs more fertile (about ten pigs) and with better forms than local ones are introduced for livelihood improvement. Pigsty construction has been completed and pig introduction are under way, and some pigs have been born.	<ul style="list-style-type: none"> - Relevance of pigsty structure - Number of pigs born - Weight - Relevance and sustainability of group-based operation system
Transportation of farm products	Carts were introduced to improve the current transportation by human power. In collaboration with the cattle ploughing group, carts that can be drawn by oxen were introduced.	<ul style="list-style-type: none"> - Economic effects of using carts - Relevance of structures of carts to be drawn by oxen - Relevance and sustainability of group-based operation system

Living conditions and natural environment improvement programs

Project	Overview	Monitoring items
Literacy education	In the target village, the instructor and students who were both local residents determined the operation method of literacy education. Later, the instructor was provided with training on the teaching method.	<ul style="list-style-type: none"> - Transition of frequency of literacy education - Relevance and sustainability of group-based operation system
Fostering of health animators	Health animator training was provided to perform educational activities using picture-story shows in order to prevent major diseases.	<ul style="list-style-type: none"> - Frequency of educational activities by health animators - Level of understanding by villagers
Forestry preservation and replantation	Training was provided on how to raise seedlings from seeds and transplant seedlings. Seedlings, which are to be transplanted in the rainy season, has not been transplanted yet in the 2nd year.	<ul style="list-style-type: none"> - Planting period and number of trees planted
Improvement of public facilities such as health centers and schools	Villagers performed simple repair work that they could. Tools required for the repair work were provided.	<ul style="list-style-type: none"> - Management system for tools provided to the target group - Utilization ratio of target facilities

Organization enhancement programs

Project	Overview	Monitoring items
All the projects including road maintenance	The initial investments required for productivity improvement must be repaid by the target groups to the community development committee in five years. In this system, the committee determines how these repayments should be used.	<ul style="list-style-type: none"> - Management of repayments by the community development committee - Frequency of committee meetings and attendance rates of members - How repayments are utilized

(2) Monitoring of pilot projects related to road maintenance

1) Premises

Daily maintenance is indispensable for using an earth-and-sand pavement road permanently. A road, being a public property or facility, is commonly maintained by the administration. However, the Bureau of Roads (O.R.) of the Ministry of Infrastructures and Public Works, an administrative entity for the Nkondo route, and the Direction for Feeder Roads (DVDA) of the Ministry of Rural Development, an administrative entity for the Kilueka route, are not expected to perform active

participation due to difficulties in budget acquisition. In this project, therefore, the road maintenance is planned to be implemented by villagers' organizations, which means that villagers in the target area will act as the maintenance entity.

It may take some time for these activities, which should be implemented continuously, to be implemented by these organizations. Additionally, roads are damaged the most by rainfall; therefore, maintenance in the rainy season from November to April is indispensable in maintaining a good road status. For that reason, it is necessary to enhance these activities regardless of the rainy and dry seasons after repair.

2) Activities

For the Nkondo route, CLER Kiasungua, a road maintenance organization, has been established and is in operation. For the coming three years, the maintenance activities will be continued under the BTC program. Therefore, the Study Team will not actively get involved for this route but attempt to exchange information with this organization.

For the Kilueka route, it is planned to establish a villagers' organization for maintenance after rehabilitation, and continue the maintenance operation in collaboration with CLER Kiasungua, an existing organization. Additionally, workshops for villagers were held to nurture understanding about the importance of maintenance, and on-the-job training was provided through road construction. As for the activity budget for the organization, it is planned to collect tolls from trucks transporting farm products, and collect charges from landowners.

a) Enhancement of organizations for maintenance activities

After the completion of community road rehabilitation in November 2009, the maintenance activities must be continued under the initiative of villagers' organizations. Specifically, the work includes (1) removal of dirt from the gutters, (2) simple repair of pavement, (3) traffic restriction in the rainy season, and (4) weeding and cleaning of the road vicinity. To maintain these activities, we will continue to enhance organization management and perform monitoring of the activities.

b) Continuation of maintenance training

- Training will be continued on the implementation and maintenance methods taught in technology transfer as pre-implementation training or on-the-job training during implementation in order to ensure that the technology is well established and transferred to other villagers.
- On-the-job training will be provided in the rainy season (March and April), after the rainy season (May and June), and in the dry season (August and September).

c) Road repair through on-the-job training

- Road repair may be required because, although steep slopes (longitudinal gradient of 5% or higher) are concrete-paved, slopes with lower gradient than 5% are paved with laterite and gravel, and problems may arise after the rainy season depending on the construction conditions.
- Although one year after construction is a guarantee period, the contractor and villagers will repair the road as required. This work will serve as on-the-job training for villagers to learn the repair method as technology transfer.

6.8 Items Validated by Pilot Projects

The details of the implemented PPs are shown in the PP sheets in Annex 6.10. This section summarizes the PP implementation results to be reflected on the community development plan, regarding 1) implementation system of the community development plan, 2) target year of the development plan, and 3) technical details of PPs.

6.8.1 Implementation System of Community Development Plan

In this Study, a community development committee consisting of Dukis of villages along the route was established. The community development committee serves as the mainstay of community development regarding maintenance of roads, implementation and continuation and PPs, and management of community development funds.

Many of the PPs for livelihood improvement are required to repay the project cost to the community development committee in five years, thus ensuring that activity funds are supplied to this committee continuously. Since the project members are liable for paying the project costs, it is expected their ownership of each project will be cultivated and that the activities will be continued.

The activities for livelihood improvement, as soon as they are well under way, are intended to implement living conditions improvement in the zone. In other words, when a sufficient community development budget is secured due to livelihood improvement and the needs of people have grown, the health sector improvement will be pursued through the improvement of health centers and the educational sector improvement through the improvement of schools, which do not improve people's income directly but are required for community development.

Such a system of implementation in the current PPs is expected to be effective from the viewpoint of ensuring sustainability. A good way of community development is to establish a community development committee first, nurture sufficient recognition of the roles required for sustainable community development, and then implement specific projects for community development.

6.8.2 Target Year of Community Development Plan

As shown in the basic concept of community development, an attempt to achieve community development in the Study Area must start with the promotion of community road improvement.

Therefore, it is advisable to implement community road improvement in the first year after the implementation of community development is determined. In this Study Area, an emergency reconstruction project in this Study improved the road between Kimpese and Kilueka and, therefore, the community road improvement is assumed to have been implemented in 2009.

As shown in the basic concept of community development, it is advisable to place emphasis on livelihood improvement projects and implement part of the living conditions improvement projects. It takes at least one year to carry out production activities for agricultural products once each in the rainy and dry seasons. The application of introduced technologies does not guarantee the achievement of the assumed amount of products in the same year because the amounts of solar radiation and rainfall vary every year and the amounts of agricultural products vary widely every year. In other words, the livelihood improvement is not necessarily achieved in the year following the one when the community road improvement is completed, and therefore, at least two years are assumed to be required in this Study. Consequently, in 2010 and 2011, it is advisable to implement both livelihood improvement as well as minor living condition improvements possible at a village level.

At a stage when livelihood is gradually improving, it is advisable to promote the improvement of public infrastructures such as health centers and schools shared by the public in the zone. In the Study, the target year of 2014 is set, on the assumption that the improvement of all the health centers and schools in the Study Area takes about three years from the year when part of the livelihood improvement starts to be achieved.

6.8.3 Technical Criteria Identified in Pilot Projects

Some projects are restricted by geological and other conditions. Table 6.7 shows the project-by-project criteria for evaluation of implementation identified in PPs and Table 6.8 shows the improvement standards. For specific implementation, the cattle ploughing, rice cultivation, animal husbandry, and replantation manuals shown in Annex 6.11 can be used.

Table 6.7 Arrangement of projects

Category	Division of projects of the basic concepts	Division of projects of the community development	Remarks	
Livelihood improvement	Cattle ploughing	Cattle ploughing	Same as the basic concepts	
	Soil preparation and improvement	Vegetable cultivation	It is realistic that soil preparation and improvement, introduction of new varieties, and book keeping projects are implemented as the vegetable cultivation activities	
	Introduction of new varieties			
	Promotion of rice cultivation	Promotion of rice cultivation	Same as the basic concepts	
	Treatment and processing for postharvest	(Treatment and processing for postharvest)	At the present time, this project is not considered as a livelihood improvement project because it may be difficult to improve livelihood by incomes made from solds.	
	Transportation of farm products	(Transportation of farm products)	At the present time, this project is not considered as a livelihood improvement project as it is difficult to calculate benefits	
	Animal husbandry	Animal husbandry	Same as the basic concepts	
	Aquaculture and fish processing	Aquaculture	Integrated under the idea that aquaculture should be first implemented before the fish processing.	
Beekeeping	Beekeeping	Same as the basic concepts		
Living environment improvement	Forestry preservation and replantation	Replantation	Forestry preservation and replantation, Moringa tree, and Roadside trees projects are all related to replantation project.	
	Moringa tree			
	Roadside trees			
	Improvement of cooking stoves and housekeeping	Improved cooking stoves	Improved cooking stoves are first promoted as a part of series of improvement of housekeeping.	
	Literacy education and book keeping	Literacy education and book keeping	Book keeping is introduced as a part of series of vegetable cultivation.	
	Handicraft	Handicraft	Handicraft is promoted from a point of view of activating villages including making of handidcrafts by collected plastic bags.	
	Reuse of plastic bags			
	Leisure activities	Leisure activities	Same as the basic concepts	
	Improvement of health facilities	Improvement of health facilities	(Health promoters)	The health promoters will be developed their implementation capacities of sensitization activities to residents through the training of health promoters in order to prevent the main diseases.
	Maintenance and management of drinking water facilities	Water supply	Integrated under the concept that arrangement of water facilities including maintenance as the water supply sector is implemented in a unified manner.	
Improvement of educational facilities	Improvement of educational facilities	To promote educational facilities improvement together with rehabilitation of schools.		
Rehabilitation of feeder roads	Improvement of feeder roads	The feeder road to Ndunguidi has been rehabilitated by Agrisud. Whenever it is possible, rehabilitation will be done at any time.		

Table 6.8 Technical receptivity evaluation criteria for each project

Project definition unit	Project	Technical receptivity evaluation criteria
Route	Community road improvement	Existence of more than 100 persons per kilometer who receive benefit from road improvement
		Existence of an organization or possibility of forming an organization in which beneficiaries can continuously perform maintenance, and capability of maintenance in this organization
		Presence of an administrative agent who can coordinate this project
Village	Cattle ploughing	Existence of unused land where cultivation is possible in the rainy season. The demand for cultivation by cattle ploughing amounts to about 20 ha or more.
		Existence of a group of 3 villagers or more who can manage oxen
		Capability of daily supply of water of 10 liters per head or more
		Absence of infectious tsetse flies or existence of traps ¹ if there are any
		Possibility of securing space for ox training for 2 months (It is effective to train 5 pairs of oxen in the same period)
	Introduction of new varieties (including soil preparation and improvement and book keeping)	Existence of fertile farm lands that permits vegetables cultivation
		Possibility of securing water required for vegetable cultivation throughout the cultivation period
		Possibility of securing a community field for receiving technical assistance, where vegetable cultivation is possible and required water can be easily obtained
	Treatment and processing for postharvest	Existence of a group of 5 villagers or more who want to perform postharvest processing
		Existence of surplus products that are not effectively utilized yet among the processed products that are purchased and consumed
	Promotion of rice cultivation	Possibility of securing sufficient water for filling paddy fields throughout the cultivation period
		Possibility of making the field mostly flat (leveling it to within ± 10 cm)
		Absence of remnants of felled trees in the soil
		Existence of a group of 10 villagers per 10 ares or more
	Transportation of farm products	Existence of many villagers who sell small quantities of farm products and pay wages for transportation of them to Kimpese
		Existence of a group of 3 villagers or more who desire joint shipment
		Existence of a road on which transporting vehicles can pass
	Animal husbandry	Existence of a group of about 5 villagers who implement the project continuously
		Possibility of daily supply water of 5 liters per head or more
		Possibility of constructing a pigsty
		Possibility of securing a pigsty floor with a sufficient strength (concrete made)
		Possibility of cultivating farm products that serve as livestock feed (such as sugarcane, wheat, and sorghum)
	Aquaculture	Possibility of securing sufficient water to prevent the aquaculture pond from drying up in the dry season
		Existence of a place where the external water level remains lower than the embankment of the aquaculture pond in the rainy season
		Existence of a source that can supply water to the aquaculture pond, having a water level that permits gravitational flow of water to the aquaculture pond
		Existence of a group of about 5 villagers who implement the project continuously
	Beekeeping	Existence of many trees and flowers from which bees can collect nectar
		Absence of houses and children's play areas nearby
		Absence of plants in which bees may make a hive (bananas, etc.) nearby
		Existence of a group of about 5 villagers who implement the project continuously
	Forestry preservation and replantation (including moringa trees and roadside trees)	Existence of a villager group with a strong demand for replantation and willingness to advocate the importance of fire prevention and replantation to other villagers
		Existence of a group of about 5 villagers who implement the project continuously
	Improvement of cooking stoves	Existence of villagers willing to introduce improved cooking stoves
Literacy education	Existence of villagers in the village, who can serve as teachers in literacy education	

¹ In the target area of this PP, there are rarely infectious tsetse flies along the Nkondo route while there are infectious ones along the Kilueka route where traps for them are set under the assistance from the Kimpese health zone.

Project definition unit	Project	Technical receptivity evaluation criteria	
		Conclusion of an agreement on tuitions between villagers who want literacy education and teachers	
	Handicraft (Reuse of plastic bags)	Existence of a group of 3 villagers or more who show interest in handicraft using plastic bags	
	Leisure activities	Existence of a common sport or competition for which competitors can be selected from multiple villages to play a game and presence of many villagers who want such games to be held	
	Improvement of health facilities (Fostering of health animators)		Existence of literate villagers willing to serve as health animators
			Capability of performing educational activities of health animators on a voluntary basis
	Water supply environment		Possibility of securing a water source less shallow than about 10 m
			Possibility of collecting a water charge required for maintenance and performing brief maintenance
	Small-scale electrification		Possibility of securing sufficient water amount and drop (water-level difference) if water power is to be used
		Possibility of collecting facility usage fees required for operation and maintenance of the facility	
Zone	School improvement	Improvement requiring the level of repair such as walls and roofs that villagers can repair	
		Supply of materials and equipment by villagers if they are locally available	
		Supply of craftsmen required for improvement work (such as carpenters and masons) by beneficiaries	
		Possibility of constructing a system that can raise funds for operation and maintenance of schools by collecting contributions from villagers or school farms	
		Formation of a group of beneficiaries for continuous maintenance of facilities	
	Health center improvement	Improvement requiring the level of repair such as walls and roofs that villagers can repair	
		Supply of materials and equipment by villagers if they are locally available	
		Supply of craftsmen required for improvement work (such as carpenters and masons) by beneficiaries	
		Possibility of constructing a system that can raise funds for operation and maintenance of health posts by collecting contributions from villagers or school farms	
		Formation of a group of beneficiaries for continuous maintenance of facilities	

Table 6.9 Improvement standard and specifications assumed from validation items

Project definition unit	Project	Improvement standard and specifications assumed from validation items	
Route	Community road improvement	Laterite pavement (pavement thickness of about 20 cm)	
		Concrete pavement in sections with gradient of 5% or higher for prevention of road surface erosion	
		Road width of 4 m and construction of gutters (earth canals) for draining of rainwater	
		Maintenance by villagers' organizations	
Village	Cattle ploughing	Two-ox plow	
		Plow made of iron	
		Two-month training for enabling cattle ploughing	
		Daily cultivation area of about 0.25 ha with two-ox plow	
	Introduction of new varieties (including soil preparation and improvement and book keeping)		Development of high nursery bed
			Transplant culturing, not direct seeding
			Mulching using locally available materials such as sugarcane residue
	Treatment and processing for postharvest		Compost made mainly from locally available plants
			Processed goods for personal consumption, not for sale (e.g., tomato stew)
	Promotion of rice cultivation		Supply of water from the water source via earth canals
			Dam-up of water level using locally available materials such as plants
			Leveling of one rice paddy lot within ± 5 cm
		Transplanting, not direct seeding	
		Water depth of about 10 cm throughout the growing period of rice	
	Ear harvesting in expectation of tillers. Harvesting twice including tillers.		

Project definition unit	Project	Improvement standard and specifications assumed from validation items	
	Transportation of farm products	Use of carts about 1 m by 2 m when drawn by human power, with steel frames Use of carts about 2 m by 3 m when drawn by animal power, with steel frames	
	Animal husbandry	Pigsty with as many rooms as required for the number of heads Pigsty as sturdy as not to be broken by pigs and made of locally available materials such as bricks and bamboos Floor made of concrete Installation of fence around the pigsty in anticipation of a case when the wall is broken	
	Inland water culture	Securing of a water depth of 50 cm or more in an aquaculture pond about 20 m by 10 m Supply of water from the water source to the aquaculture pond via earth canals Installation of pipes (about 20 cm in diameter) for draining surplus water to prevent overflow of water from the embankment of the aquaculture pond Supply of fish feed supplying plants and a storage place for leftovers in part of the aquaculture pond	
	Beekeeping	A scale of about 6 beehive boxes	
	Forestry preservation and replantation (including moringa trees and roadside trees)	Raising of seedlings for forestry preservation from seeds as a basis Raising of seedlings in vinyl pots, not direct seeding Maximum replantation area of 2500 m ² per village	
	Improvement of cooking stoves	Improvement of stoves using unglazed bricks and cohesive soil Stoves for pots about 30 cm in diameter	
	Literacy education	Lessons given using simple blackboards	
	Handicraft (Reuse of plastic bags)	Use of scissors for cutting plastic bags and knitting needles (about #1) in the case of handicraft using plastic bags Use of cutters for processing in the case of handicraft using local resources (such as vines)	
	Leisure activities	Holding of periodical friendship games about once in 6 months	
	Improvement of health facilities (Fostering of health animators)	Educational activities using picture-story shows in order to prevent major diseases, diarrhea and malaria	
	Water supply environment	Installation in a location where there is little influence from inundation water Well frames made of concrete Well bottoms equipped with filters made of crushed stones, sand, etc. Use of draw wells, not equipped with hand pumps Wells equipped with frames higher than the ground (about 50 cm) and a cover to prevent inflow of rainwater or floodwater or foreign substances into wells Collection of water charges from beneficiaries to be used as a financial resource for operation and maintenance	
	Small-scale electrification	Use of photovoltaic and water power as energy sources with scales established in accordance with uses Collection of usage fees from beneficiaries to cover operation and maintenance costs and implementation of operation and maintenance within the collected amount	
	Zone	School improvement	Scope of improvement such as concrete finish of floors and walls and replacement of roofing that villagers can handle Collection of burden charges from the stakeholders, which will be secured as a financial resource for operation and maintenance of schools Operation of school farms and use of them as a financial resource for school expenses and operation and maintenance expenses
		Health center improvement	Scope of improvement such as concrete finish of floors and walls and replacement of roofing that villagers can handle Collection of burden charges from the parties concerned, which will be secured as a financial resource for operation and maintenance of health facilities Operation of community farms and use of them as a financial resource for school expenses and operation and maintenance expenses