Limpopo Department of Agriculture
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Republic of South Africa

No.

Study on the Integrated Holistic Rural Development and Soil Conservation Programme in the Schoonoord Area in Sekhukhune District, Limpopo Province, Republic of South Africa

Final Report

March 2007

JAPAN INTERNATIONAL COOPERATION AGENCY

IC NET LIMITED

TAIYO CONSULTANTS CO. LTD.

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PREFACE

In response to a request from the Government of the Republic of South Africa, the Government of Japan decided to conduct the Study on the Integrated Holistic Rural Development and Soil Conservation Programme in the Schoonoord Area in Sekhukhune District, Limpopo Province and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Hiroaki Yonesaka, IC Net Ltd., during the period from October 2002 until February 2007.

The team held discussions with the officials concerned of the Government of the Republic of South Africa, and conducted a series of field surveys in the country. After the team returned to Japan, further studies were also conducted and the present report has been prepared.

I hope that this report will contribute to the sustainable development of poverty rural areas in Limpopo Province as well as in the other areas in the country, and to the enhancement of friendly relationship between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of South Africa for their close cooperation extended to the Study.

March 2007

Ariyuki Matsumoto
Vice President
Japan International Cooperation Agency

March 23. 2007

Mr. Ariyuki Matsumoto
Vice President
Japan International Cooperation Agency
Tokyo, Japan

LETTER OF TRANSMITTAL

Dear Sir

We are pleased to submit to you herewith the report on the Study on the Integrated Holistic Rural Development and Soil Conservation Programme in the Schoonoord Area in Sekhukhune District, Limpopo Province, Republic of South Africa. The report presents the results of all works performed in both South Africa and Japan during a total period of 55 months from September 2002 to March 2007.

In line with the development framework of the Republic of South Africa known as "Accelerated and Shared Growth Initiatives for South Africa (ASGISA)," also based on the lessons learned from the 2-years implementation of eight pilot projects during the Study, the Team prepared a development plan for the target area in Skehukhune District, Limpopo Province, as which has been designated as one of the "poverty node" in the country. The pilot projects were successfully completed with remarkable results, and the Report proposes "Centers of Excellence Project (CEP)," which is continuation and expansion of the activities initiated by the Study to Limpopo Department of Agriculture. We sincerely hope that CEP as to be implemented by Limpopo Department of Agriculture as early as possible.

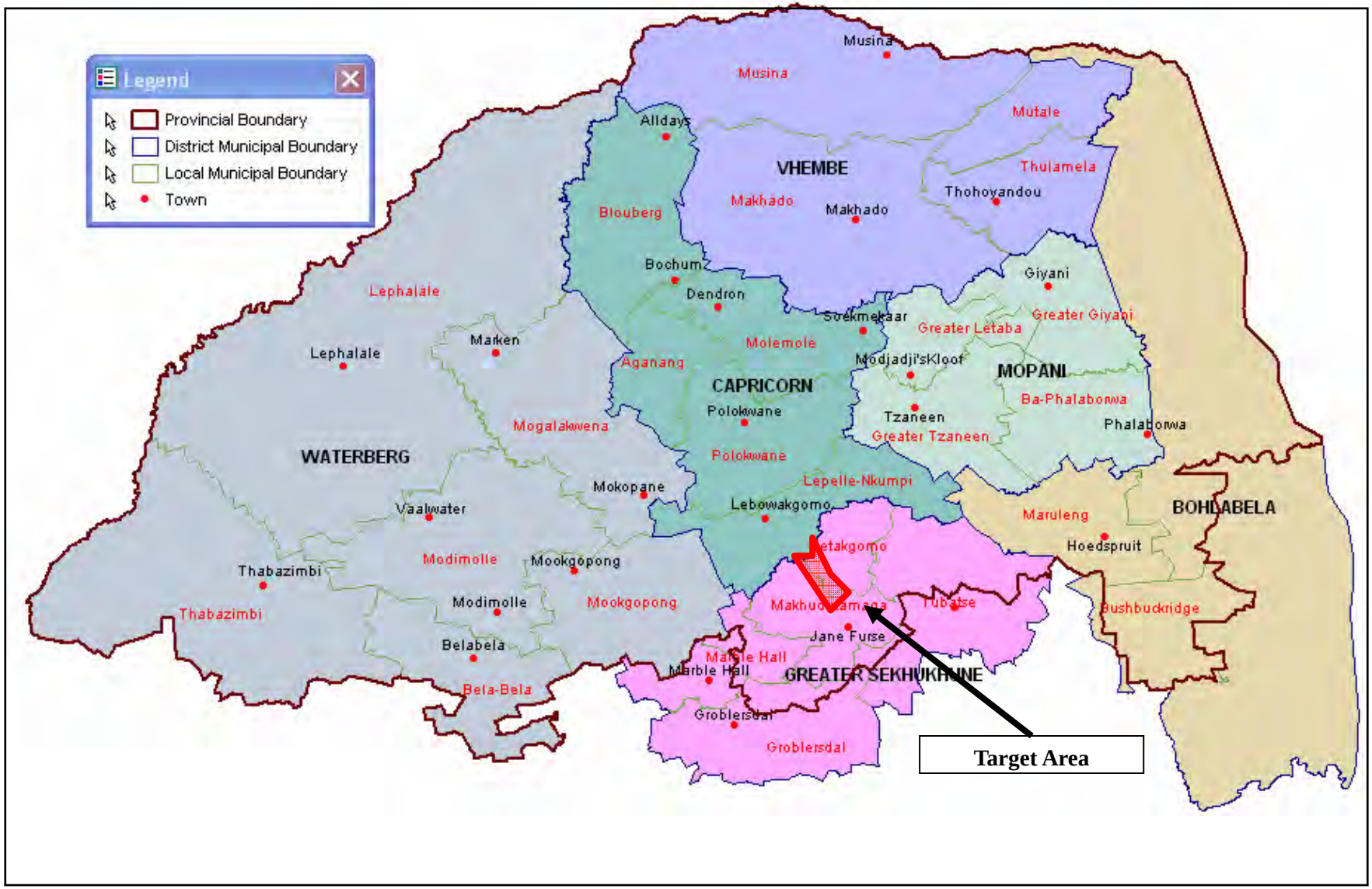
We wish to express our deep appreciation and sincere gratitude to your Agency, the Ministry of Foreign Affairs, the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan for the courtesies and cooperation kindly extended to our team.

We also wish to express our deep appreciation and sincere gratitude to the South Africa Office of your Agency, the Embassy of Japan in South Africa, the National Department of Agriculture of South Africa and other authorities concerned for their close cooperation and assistance extended to our team during our field investigation and studies in South Africa.

Very truly yours,

Hiroaki Yonesaka
Leader of the Study team
Study on the Integrated Holistic Rural Development and Soil Conservation Programme in the Schoonoord Area in Sekhukhune District, Limpopo Province, Republic of South Africa

Limpopo Province



Olifants river

Lepellane irrigation scheme

Open grazing in the dry season

Traditional mad oven
(Women Business Promotion Project）

Bread baking in a new baking house
(Women Business Promotion Project)

Fodder crop production in a back yard garden with water harvesting
(Livestock Owner Group Support Project)

Low cost chicken house for local free range chicken
(Livestock Owner Group Support Project)

A target group in Radingwana
(0.1 ha Integrated Farming Project)

Farmer to farmer training by the leader of the Radingwana group
(0.1 ha Integrated Farming Project)

Participatory soil mapping
(Community Soil Conservation Project)

Protection structure with used tires
(Community Soil Conservation Project)

Graduates of a training cource for small scale integrated farming at Tompi Seleka Agricultural Training Center
(PRIDE 2)

Abbreviation

AMS : Agriculture Management Service

ARDC : Agriculture and Rural Development Corporation

ARC : Agricultural Research Council

ASGISA : Accelerated and Shared Growth Initiative for South Africa

BASED : Broadening Agricultural Services and Extension Delivery

CASP : Comprehensive Agricultural Support Programme

CEP : Centers of Excellence

DHSD : Department of Health and Social Development

DWAF : Department of Water Affairs and Forestry

HOD : Head of the Department

IDP : Integrated Development Plan

JICA : Japan International Cooperation Agency

JIPSA : Joint Initiative for Priority Skills Acquisition

LADEP : Limpopo Agricultural Development Programme

LDA : Limpopo Department of Agriculture

MAFISA : Micro-Agricultural Finance Institution of South Africa

NDA : National Department of Agriculture

PEA/PDA: Participatory Extension Approach / Participatory Development Approach

PTO : Permission to Occupy

RESIS : Revitalization and Strengthening of Irrigation Scheme

PRA : Participatory Rural Appraisal

PRIDE : Participatory Rural Integrated Development

RSA : Republic of South Africa

SAR : South African Rand

Executive Summary

1 Background of the Study

The goal of the Study is to pursue smallholder development to create stable income sources and improve living standards in the target area of semi-arid and poverty area. The Study will prepare a Rural Development Master Plan (M/P). The target area of the Study is the catchment area of the Lepellane River within Sekhukhune District and this area is split into two Local Municipalities of Fetakgomo and Makhuduthamaga, including 85 villages.

The Study was conducted during the period from September 2002 to March 2007. In the first phase, the team conducted basic studies in the target area, and formulated eight project proposals, and then implemented them in the second phase. The followings are the eight pilot projects. 1) 0.1ha Integrated Farming Project, 2) Livestock Owners Group Support Project, 3) Community Soil Conservation Project, 4) Community Forestry Project, 5) Women Business Promotion Project, 6) Practical Farmers' Training Project , 7) Mobile Information Unit Project, and 8)Local capacity development project.

2 The Target Area

The target area is about 1,200Km^2 in area and includes 85 villages with an estimated population of about 180,000. Annual rainfall is 400-600mm, but recently the rainfall has been less than this, with two droughts during this study period alone. The vegetation is being increasingly depleted throughout the area as the result of overgrazing and logging. As the vegetation decreases, the soil is also increasingly eroded, and there are signs of surface erosion and gully erosion, called "donga."

The national government in early 2001 identified 13 areas with extreme poverty and lack of services and facilities to be targeted for accelerated rural development; these "nodal area" include Sekhukhune District. Labor force statistics indicate that there is very low economic activity in Sekhukhune District. Only 31% of its adult (16-65 years) population is economically active. A high proportion of households (38%) in Sekhukhune District records pensions and grants as the main source of income, while only 21% on salaries and wages. Household incomes are very low in the District, with 84% of households having received less than SAR 800 (poverty line income). This is a little higher than the average for nodal areas (77%) and much higher than the national figure (51%). Workforce data in the Integrated Development Plans (IDPs) for Fetakgomo and Makhuduthamaga Local Municipalities show that the economy of the target area is poorly developed. Unemployment is very high and occupations come mainly in

the public sector.

The village profile study conducted in this study indicated that about 70% of the population of target of this study was unemployed. The average annual revenue of the households surveyed in the village profile study was SAR 8,111. However, the average annual revenue of households headed by women without a primary source of revenue, including government aid, was a mere SAR 3,770.

3 Farming Area

Farming area of the target area can roughly be divided into three, the area under the irrigation schemes, the dry land farming area and small-scale irrigation farming area.

Many irrigation schemes are run down, have low production due to conflict and low motivation among the farmers. This situation has much to do with the way schemes were designed for top-down management and past failure in recognizing the real needs of users.

In the dry land farming area, farmers cultivate few kinds of crops, with sorghum and millet occupying more than 95% of the arable land. Farming practice such as home seed-raising (native seed), no-fertilizer, and direct mixed sowing are primordial. Although agricultural potential in this area is very low, increase in productivity is an important issue for food security and poverty alleviation.

Farmers in the small-scale irrigation farming area produce mainly vegetables for cash. There are a few farmers who show good performance in vegetable cultivation and have strong entrepreneurship. However, they still face some difficulties such as shortage of financial support and lack of suitable agricultural technical instructions.

4 Poverty

The poverty line determined by the national government means an annual cash income of SAR 4,236. Meanwhile, the village profile survey by the study team found that the average annual cash income of interviewed households was SAR 8,111. The village profile survey found the shares of cash income to be: 1) Wage/salaries (38%), 2) Pension (37%), 3) Child support grant (11%), 4) Small-scale trading (6%), and 5) Others (8%).

5 Traditional Authority

Ordinary people who have a problem that requires consultation with community leaders go to a

tribal office, rather than a municipal office. Traditional authority knows needs on the ground. Some traditional authorities are eager to plan and implement development projects based on their daily contact with people.

6 Land Tenure

Based on the Communal Land Right Act, the Department of Land Affairs is currently undertaking land tenure reform in cooperation with the provincial governments. But it will take many administrative procedures until the land tenure issue is finally settled and lands belong to individuals or other entities. Disputes are also expected. Thus it will take much time until the work to settle legal rights on communal lands is completed.

7 Gender Analysis in the Target Area

Men have to migrate to urban cities to look for a job. On the other hand, men staying behind in rural areas can hardly find jobs and tend to lose their role as the economically active and socially positive partner within the family. Women, remaining in the rural area, often engage in subsistence farming. Female-headed households account for about 80% of the total in the target area. It is difficult for men to identity their role in female-headed households. Even where they head households, some men are unable to provide for the welfare of his family. The child support grant gives SAR 190 per month for children up to 14 years of age and without a father. The social welfare helps ease economic difficulties, but also results in deepening psychological dependency on government aid.

8 Present Conditions of Livestock Sector

The gross value of production from agriculture in Limpopo Province is about SAR 4 billion, of which livestock accounts for 51%. Most, over 90%, of this livestock activity is in the commercial livestock sector. However, over 60% of the cattle and 95% of the goat populations are in the communal areas. The livestock of Sekhukhune district are significant, representing 11%, 23% and 22% respectively of the Province's cattle, sheep and goat populations. Within the target area, estimates from available livestock data suggest that there are about 24,000 cattle, 5,500 sheep, and 33,000 goats in Sekhukhune. The average ownership of those households with livestock is 6 cattle, 1 sheep and 8 goats.

Livestock is considered generally as an alternative means of saving. Cattle are usually considered as a long term capital investment, with goats and sheep being a medium term investment and considered to be a more liquid asset. Poultry are the most likely livestock to be sold first in time of need. Subsequently, few cattle are sold for cash or bartered for other goods.

Livestock owners in some communities of the target area have, on their own initiative, formed more than 20 livestock associations. These associations offer a platform to build strong capacity and commitment to address a wider range of issues concerning livestock production and productivity.

The breakdown of traditional patterns of control of land has made the resources more public and open access, and consequently, overgrazing and erosion of rangeland have resulted in a decline in livestock ownership, numbers and production. Mortality rates have increased. Continuous grazing results in the more palatable and nutritious plants being defoliated with no physiological rest.

9 State of Forests in Limpopo Province

The vegetation component of Limpopo Province represents three biomes: the forest biome makes up 0.2% of the area, the grassland biome 3.2% and the Savannah biome 96% of the province's vegetation type. Tree coverage of Limpopo Province is 1.26%, which is the lowest level in the nation with Western Cape Province and others. Only "Combretum Woodland" can be seen over the target area of this study. The target area of the Study has been identified as "degraded.

10 Limpopo Department of Agriculture (LDA)

LDA is responsible for effecting the national agriculture policy and strategy within the province. The strategic goals for agriculture in the Republic of South Africa (RSA) have been set as (i) food security and poverty reduction; (ii) land redistribution and farmer settlement; (iii) improving access to and quality of agricultural services; (iv) human resource development; (v) trade development opportunities to support agribusiness; (vi) LandCare program and sustainable natural resource management; and (vii) restructuring of agricultural state enterprises.

Since 2005, LDA has had the basic policies of placing skilled staff in district offices, recruiting younger extension officers, and strengthening cooperation with local municipality governments. Through these policies, LDA aims at the following: (i) it will be possible to plan and implement project in cooperation with local municipalities; (ii) direct assistance to cropping and livestock farmers is strengthened.

LDA's budget allocation for FY2005-6 was about SAR 1,094 million. The actual expenditure was about SAR 980 million, or about 90% of the above figure. But the ratios of payment for capital assets such as projects were generally low: compared to the original budget,

“veterinarian services” was 44%, “assistance to farmers” was 75%, and “farmer training” was 60% (all the names were those prior to restructuring).

The LDA’s priority issues after apartheid era can be roughly divided into the privatization of the former Agricultural and Rural Development Corporation (ARDC), the rehabilitation of the large scale irrigation schemes and transferring control of them to local residents, the reallocation of agricultural land, and ensuring food security and raising incomes for the impoverished black population, however, these aid policies were unable to achieve the initial goals. The main factor behind this was that the schemes failed to consider the need to improve the farmers’ skills, as many of them had had no experience with family farming under the previous administration. On the other hand, LDA suffered a serious lack of knowledge on the techniques needed to improve small-scale farming and ways to popularize such techniques. Therefore, most of the techniques that LDA introduced to poor farmers were merely miniaturized versions of techniques used on large farms.

The LDA’s 2006 strategic plan highlighted the catchphrase “from farming to agricultural industrial development.” This likely originated from the LDA’s past and recent experiences. One is based on the sense of crisis due to the straggles of land reforms, land redistribution and ARDC’s privatization; another is based on the belief that, small farmers should be organized to produce products that are then marketed so that farmers receive more direct economic benefits; and finally the third is based on the concept that farmers should be organized and access points integrated.

The government of RSA in 2004, under the initiative of the vice president, showed the basic framework of country’s economic development for the following ten years in “Accelerated and Shared Growth Initiative for South Africa: ASGISA.” In order to form an uniformed manner of response to ASGISA in the agricultural sector, “National Intergovernmental Forum for Agriculture and Land” was held. In this forum, following five priorities were set as pillars of the agricultural development strategy.

- Broad based AgriBEE (Agricultural Black Economy Empowerment) and integrated food security
- Sector investment in labor absorbing and competitive value chain
- Bio-security and disaster management
- Research, extension, education and training
- Cooperative government and building of partnership

11 Department of Health and Social Development (DHSD)

DHSD in FY2003-04 received SAR 5.0 billion for its social welfare function. The annual distribution of social security to DHDS's "Sekhukhune Sub-District" exceeds SAR 160 million. The numbers receiving child support grant increased as the national government raised the limit of eligibility from 7 to 14 years in the FY2003-04 budget.

12 Local Government in the Target Area

Sekhukhune district has five local municipalities, including Makhuduthamaga and Fetakgomo. Both Makhuduthamaga and Fetakgomo municipalities made considerable progress in recruiting personnel and now have almost full staff complements. However, there are still serious barriers to the effectiveness in managing the municipalities' development projects and programs.

According to the Integrated Development Plan (IDP) of Fetakgomo Local Municipality for 2005/06, the local municipality's total operation budget is about SAR 160 million. But Fetakgomo Local Municipality's own municipal budget is only SAR 4.5 million out of this, and the rest comes from contributions from other government agencies and the private sector. The largest portion of the operating budget is for repair of the irrigation scheme in the municipality, which takes up about SAR 112.5 million, or nearly 70% of the total.

13 Achievements of PRIDE and its Evaluation

13.1 0.1 ha Integrated Farming Project

The target area was constrained in terms of water resources, the amount of capital available to the farmers and the farming experience of the farmers. This made it difficult to introduce the normally recommended farming models. The pilot project for the 0.1 ha integrated farming scheme aimed for the development and demonstration of a farming model which could just about work under such difficult conditions.

The project goal which was set at the time of the projects launch was for "the selected farmers to be able to adequately manage the 0.1 ha Integrated farming system," and the indicator for the achievement of the goal was "70% or more of the participating farmers turning a profit at the time of the projects completion." Out of the three areas of farmland that were selected as farmers' groups in fiscal year 2004, the group in Radingwana village succeeded in turning a profit. The group in Marulaneng village only has about six months of vegetable cultivation due to the electricity problem, but the vegetable sales during this period and the sales of eggs which were shipped year-round when added together were about the same amount as the annual cost. If this is a 50% achievement rate, the total achievement will be roughly 75%. It is difficult to

determine the success of the individual farmers selected in fiscal year 2005 because insufficient data has been accumulated. However, some individual farmers have already achieved more than SAR 1,500 in sales, and they seem to be gaining some profit.

It can be concluded that the 0.1 ha integrated farming model with a core element being "vegetable cultivation using compost from chicken manure" can function well. Specifically, it was demonstrated that even soil in the target area which contained a small amount of organic matter can produce significant yields if the soil quality is improved by applying compost made from chicken manure and plant-derived materials, and that the products can be sold mainly within the community.

13.2 Livestock Owners Group Support Project

To test the hypothesis that "benefits derived by livestock owners from their livestock could be improved and increased," this pilot project was planned and implemented. In essence, the Livestock Owners Group Support Project is a consultative process of community facilitation. The role of the intervention by this project was to facilitate a consultative process with the community, starting with the existing knowledge, experiences and resources of the community to identify and test opportunities for improving benefits from the ownership and management of livestock. Along with the continuous facilitation to the livestock owners, appropriate technologies to improve or replace existing practices were demonstrated as a participatory action research. This project consists of five components:

1. Capacity building of livestock owners' associations and special interest groups.
2. Capacity building of government livestock extension services.
3. Improvement of rangeland management.
4. Improvement of fodder production in household patches.
5. Improvement of production of village chickens.

During the period of the project 17 interest groups with a total membership of over 200 livestock owners were formed. By the end of the period, these groups were all active although the groups were at various stages of "development." However, overall, the pilot design expected that a greater response, commitment and involvement from the LDA field staff would be forthcoming, than was achieved.

The demonstration site established by this component revealed that perennial palatable productive species still exist in the plant community in the degraded rangeland. The plan biomass of the site increased drastically to 850kg/ha from 100kg/ha.

The household fodder production demonstration showed that by using a systems approach involving appropriate water harvesting techniques, short season annuals and drought resistance perennials, a significant contribution can be made to household food security and livestock productivity, under the constraints of variable and low annual rainfall. Water harvesting techniques used by the farmers were able to increase the effectiveness of rainfall through improving soil moisture levels and strategic watering to bridge periods of inadequate soil moisture during the growing season for about 4 weeks, and to extend the period of adequate soil moisture for plant growth. This household patch fodder production makes about net benefit of SAR 400 per year for a household.

This project verified that village poultry flocks with appropriate management can make a significant contribution to household food security, if mortalities due to disease and predators can be decreased. The village chicken is productive and could contribute under low management systems SAR 4,000/annum for a flock of 10 hens and a cockerel.

13.3 Community Forestry Project

This was why the PRIDE Team determined that the community forestry project was indispensable in order to realize the sustainable development of the target area with the purpose of the afforestation of the area by tree plantation. Forestry projects are long-term efforts. The “community forestry project” was launched as a pilot project, combining the nursery program (which creates short-term benefits) and the model woodland rehabilitation with tree planting, as well as some small-scale greening activities at schools and in individual house gardens.

It became clear that the seedling production at nurseries by community groups was technically possible. However, marketing the seedlings was never easy. The total sales had reached about SAR 18,000 for two years since the project started. The PRIDE team virtually supported the community group by purchasing the seedlings for the first two years of the project, and then external sales finally started, but they hardly found any demand from individuals.

The goal of the project for seedling production which was set at the beginning of the project was that “90,000 seedlings would be produced at the nursery and planted on private properties and schools,” and that “the survival rate of the seedlings would be 60% or more.” The actual amount of production was far smaller than the intended 90,000 seedlings. However, the planted seedlings generally grew well, although some of them took longer to germinate, and the survival rate of the seedlings certainly reached the goal of 60% or more. To summarize, the large-boned plan that the nursery would be managed by the community group and start functioning was

realized.

The goal for the model woodland rehabilitation set at the beginning of the project was that “the deteriorated community land would completely recover its vegetation and would have sufficient forest density.” Radingwana completed construction of the fence and planted the seedlings that they had produced. Ga-Kopane started construction of the fence, but stopped their activities before the fence was completed. They did not get to the planting stage. The conclusion was that the goal set at the beginning was too high and neither groups achieved the goal.

13.4 Practical Farmer Training Project

The project's training is distinctive in four ways: 1) It prioritizes young people that are very likely to farm in the future; 2) The basic concepts are “learn on site” and “technology transfer between farmers;” 3) In the practical training for farmers, the trainees farm on the scale that will be feasible in the future; and 4) The farmers taking on trainees provide a site for their practical learning experiences as the trainees' “mentor farmers.” The training consists of the three parts of Part 1: Selection of trainees, Part 2: Practical farm training (six months), and Part 3: Training at the Tompi Seleka Agricultural Training Center (three months).

18 trainees in the first year finished the entire training program, and 20 in the second year finished the practical training. It became clear that, contrary to the popular belief, many young people in the area had a keen interest in agriculture. At the same time, it was much too optimistic to expect that some young people with no farming experience would start farming once trained.

The structure whereby local farmers teach young people about agricultural technology, these youth learned while practicing and practical training is provided in affiliation with a formal training organization is completely a new idea. This project proved the potential and effectiveness of this structure for training. Also, the mentor farmers that participated in this project could serve as important partners for LDA in providing agricultural training and disseminating agricultural technology in the future.

13.5 Women Businesses Promotion Project

The project picked up an example of traditional home style bakery business to prove the validity of a small-scale enterprise model using local resources and to establish mechanisms for the extension of the model within the target area. Expected outcomes include the development of several target groups into small-scale business entities who can share their experience and

knowledge with other potential groups.

After having successfully put their bread-baking business on track, most target groups are becoming autonomous. They have become capable of stably producing good-quality bread and doughnuts using traditional ovens. From a marketing perspective, they have been able to attract individual customers both within their own communities and at the local markets held at pension-pay-points, at the same time accumulating experience that later will enable them to engage in contract sales. Yet, an even more important achievement is that the group members have boosted their confidence and have given them a concrete “image” of what business management is by accumulating small success experiences in their bread-baking business.

The project designated home baked bread as its target product because it fulfilled the following conditions.

- A product of high necessity in the target area, which is currently provided from the outside (existing demand and the possibility of an alternative)
- A product that can be differentiated from already existing products (advantage in market competition, possibility of a niche market)
- A product that can be produced without a high level of capital accumulation (low impact)
- A product that can be produced without a high level of production technology (value adding by using simple technology)
- A product that can be produced without a large-scale organization (management by a small number of people)

13.6 Community Soil Conservation Project

This pilot project was designed with the two objectives described below.

1) Creating a sense of ownership among the community members to realize the continuous, self-initiated, active participation of both community residents and LDA staff. Participation of both parties from the planning stage throughout the process of the project should be maintained.
2) Developing a technical design for simple soil conservation structures that will achieve the maximum result with limited input and can be easily built and maintained by local communities.

Because the project activities were disrupted from time to time due to flood damage and delay in LDA’s administrative procedures, not all planned activities were completed. The planned structures were almost completed in Tjatane. But in Mankotsana and Machacha, about 40 to

50% of the planned structures are incomplete.

It is fair to mention that the effectiveness of the waterway protection structure combining tires and vegetation has been proven to a certain extent as the structure withstood a flood. Capacity building of LDA staff and the communities helped them become more capable of making plans ahead and managing soil conservation activities. Nevertheless, there still room for improvement to be self-reliant for preparing appropriate plans and for implementing all the necessary activities of participatory soil conservation.

13.7 Mobile Information Unit Project

This project decided to put together a Mobile Information Unit, a caravan equipped with media and information devices and educational materials on agricultural techniques, and try using the Unit for extension activities in the target area on a regular basis. This scheme would expand opportunities for people of the target area to access agricultural information. In addition, the project aimed to strengthen working relationships between LDA's communication section in the Head Office and other stakeholder organizations, e.g., Sekhukhune district offices, research institutions, and training centers, and secure necessary information sources.

Information service activities by the Mobile Information Unit in the target area became regular. The Unit visits about 35 pension-pay-points for 10 days a month, and serves 4-5 days a month in extension and PR events held by LDA.

As regular visits by the Mobile Information Unit became routine, some willing people were seen taking up the microphone and discussing their own projects and farm techniques, and promoting their agricultural products. In other words, the Mobile Information Unit came to offer to individuals and groups a platform for information transmission.

As staff members at the Sekhukhune district office succeeded in running the Mobile Information Unit, they came to recognize that they themselves, not the LDA Head Office that they depended on, were the one who undertake the critical functions in information service. Moreover, it is clear to the team that the work of the Mobile Information Unit gained wide recognition from people in the area and government officials, boosting the morale of the staff members at the Sekhukhune district office.

14 Lessons of PRIDE

Lessons learnt from the pilot projects are summarized as below.

Project	Lessons Learnt
0.1ha Integrated Farming Project	(1) Even under adverse circumstances, small-scale farms work. (2) The size of a farm field should be adjusted based on the quantity of water available. (3) Manure compost can help improve soil fertility. (4) Before expanding the scale of a farm, it is necessary to increase the production per farm. (5) It is possible to sell products outside communities. (6) Capacity building of farmers begins with a chain of small successes. (7) There is another option to run small-scale farming that grows only vegetables. (8) While it is difficult to grow feed grains, it is possible to cultivate sunflowers. (9) Farmers can produce sources of animal protein on their own.
Livestock Owner Group Support Project	(1) Finding and cultivating people with leadership skills is a key to success of a development project. (2) There is still potential to recover rangelands. (3) Water harvesting is effective for small-scale production of fodder production. (4) The productivity of village chicken can be improved.
Community Forestry Project	(1) It is too optimistic to expect that community people naturally understand benefit of forest. (2) The combination of public work approach and livelihood development component is realistic. (3) Nursery business development requires prior confirmation of market potential and capacity development of the target group on marketing and business negotiation.
Practical Farmer Training Project	(1) Youth in the area are positive about agriculture. (2) Technical support should be accompanied by initial funding support. (3) “Farmer to Farmer” extension is a considerable possibility. (4) Mentor farmer can be a partner of LDA.
Women Business Promotion Project	(1) Small-scale business is profitable, if designed properly. (2) Traditional method and technologies have important merits. (3) Management of groups is the key to success. (4) Assistance for small-scale business should be given step by step. (5) “Grass root extension” should be tried. (6) The most important challenge.
Community Soil Conservation Project	(1) Participatory planning can work even for the soil conservation project. (2) Continuous communication with the community is necessary. (3) Flooding can occur. (4) From soil conservation to environmental conservation. (5) New structure for soil conservation using tires and planting is effective. (6) Internal resources and external resources should be used effectively. (7) Improvement of efficiency in administrative procedure is one of the critical challenges of LDA. (8) Extension system should be re-designed.
Mobile Information Unit Project	(1) People seek for information. (2) Active information hub should be realized. (3) Trust can be established on the ground of “routine work.”

15 Strategic Vision for Holistic Development

Applying its experience and findings in the pilot projects that the team has been vigorously implementing for the last three years, the team proposes defining the combination of the following three norms as a strategic vision for integrated development in the target area based on small-scale agriculture.

- Growth: Generate economic activities to be self-reliant
- Equity: Ensure people's participation to be confident
- Stability: Recover the ecological and social balances to be secured

16 Vision for Growth

It is of utmost importance for the people in the area to secure means to earn incomes and stand on their own feet financially, rather than depend on various kinds of public grant. This necessitates, however, coordinated efforts to explore and exploit small but critical income generating opportunities that are now half-buried in local society. However, instead of carefully examining the situation by shedding light from various angles to find location-specific solutions, the government has tended to "teach" the people how to emulate perceived "modern and large-scale" ways of production. In this context, it may not be an exaggeration to state that the local people have not been given adequate chance to experience their indigenous development in a form adaptive to their environment and to today's economic reality. Organized efforts should be made - as opposed to isolated and piecemeal attempts - to explore various development possibilities in the local context. The team would like to see the provincial government, municipalities, NGOs and the private sector work together with the local people in seeking opportunities for income generation by taking into consideration local potential and constraints.

17 Vision for Equity

The essential mechanism to secure equity for the local people should be enhanced community power and reliable municipality capability. Unfortunately, both the community and municipal governments of the target area are in transition and weak. We need an alternative here, too. The alternative is a new norm that people should contribute considerably to development projects, thus converting the image of their being passive beneficiaries of development. People should gain the ownership of development projects with a clear-cut mechanism of staking their money, labor and time on the success and failure of projects. It should be remembered that development projects would remain, in reality, no more than self-perpetuating hand-outs without people's strong sense of their interest being at stake. From the very beginning of development activities, people's participation must be secured on the ground, not on paper. People's participation must

be rigorously maintained even if it means sacrificing speedy implementation of projects and disbursement of funds. The participation of people is not an additional virtue of development but an essential element of development.

With regard to empowerment, farmer-to-farmer training provides us a useful lesson. Such training gave pride and a sense of solidarity and accomplishment to both trainers and trainees, leading to their socio-psychological empowerment. The team suggests that farmer-to-farmer training be used more actively and strategically for development of the target area.

18 Vision for Stability

Although the environmental deterioration is steadily underway all over the area, the people seem unalarmed with these “familiar” problems. Unless the environmental problems are dealt with urgently and determinedly, they will begin undermining the very foundation of local economic development.

In the social dimension, stability issue has another face. The gravest issue is no doubt HIV/AIDS which is rampant throughout RSA. Although this study did not elaborate this issue, the sober fact is that the target area is no exception in suffering much damage from the disease in many ways. Another worrisome issue is unemployment among the youth, which is naturally related to delinquency and crimes committed by young people. These pilot projects showed that many young people are actually interested in farming. Active measures should be taken to utilize and enhance their interest, which is a huge asset in local communities.

19 Five Analytical Dimensions of the Master Plan

To elaborate and transform into a workable master plan the strategic vision discussed in the previous section, the team further analyzed from the following dimensions: (1) Production Technology Dimension; (2) Natural Environment Dimension; (3) Economic Dimension; (4) Social Dimension; and (5) Political and Administrative Dimension.

19.1 Production Technology Dimension

PRIDE took advantage of various techniques and approaches new to Sekhukhune. By and large, however, the beneficiaries at least were extremely interested in new techniques, and in almost all cases they were very accepting of these new techniques. It is certain that small farmers in poor and arid regions in the Limpopo province, as well as in the target area, are ready to actively take on “small technological innovations and the combination of techniques,” which PRIDE has been promoting.

Indeed, there was even a sense that the administration tends to have a trust in large, modern production technology, overlooking small-scale and simple techniques and traditional techniques. In particular, they should recognize that extremely adverse conditions characterized by the absolute shortage of water and inadequate accumulated capital make it essential that small-scale agricultural development in Limpopo province lead to sustainable development. The farmers will be unable to compete against commercial farmers unless they develop simple and unique low-cost production techniques suitable to small-scale producers, rather than just a miniature version of the same production techniques used in much larger commercial farming. With this method, added-value is raised while keeping the scale small and costs down, not quickly expanding scale and making major investments. A clever combination of small innovations, simple techniques and a re-evaluation of traditional techniques should become the key concept behind the technology needed for the province's semi-arid small-scale agricultural development.

19.2 Natural Environment Dimension

When devising a development strategy for the target area, we must keep in mind that the natural resources within the area fall into three very different geographical categories. Zone C including the upstream area of the Lepellane River and part of the Olifants River's catchment basin has the potential for small-scale irrigation. Zone B is the Lepellane floodplain. There are very few water resources. Zone A encompasses the other type, which are primarily characterized by a steep range of hills and made up of mountain ranges and mountain areas with very little plant life. Zone A has very little potential for agricultural development, but preventing flooding and restoring plant life here is extremely important for the entire target area in terms of preventing soil runoff in the downstream areas in the future.

The only areas that have almost certain potential for agricultural development are those in Zone C. Nevertheless, if more farmers practice water harvesting, the growth period for dry-season feed crops cultivated on a small-scale in backyards can be extended by three to four weeks, improving productivity in Zone B.

Of course, it is essential to raise people's awareness of the environment's perilous state and take steps that will improve the target area's natural environment in fundamental ways, such as plant and soil conservation. We can conclude that during the initial stage of plant restoration in the target area lasting five to ten years, the government must take the lead in afforestation activities. If the residents were actually able to enjoy the benefits of the trees, afforestation would gain momentum as a social movement. Another method involves the integration of livelihood

improvement projects and afforestation.

The Livestock Project succeeded in working with the residents to fence off part of the grazing land on shared land to protect the plants. This experiment suggested that even if trees cannot be planted for some reason, as long as grazing land is appropriately managed, plant life including trees will be naturally restored, leading to preservation of the natural environment. Further, the Conservation Project was a pilot project started at the instigation of community residents, and achieved its results by encouraging them to participate as much as possible.

19.3 Economic Dimension

Assuming that the average annual income of the approximately 40,000 households in the target area was SAR 8,000, the economic scale overall would be over SAR 300 million. Simple calculations based on data from the study suggest that the target area represents a large market equivalent to SAR 15 million for bread alone. The locally made bread that the Women Business Project in PRIDE prepared using traditional methods proved that it was competitive enough. Accordingly, over the long term, there is a chance that manufactured bread could be gradually replaced by locally made bread.

Similarly, vegetables could also be replaced with local produce. Since fruits and vegetables make up 6.3% of residents' diets, simple calculations similar to those performed for bread indicate that the potential market for fruits and vegetables is worth SAR 19 million in the overall target area. Calculating the market potential as with bread and vegetables indicates that the market for chickens is equivalent to SAR 16 million a year in the area demonstrating that there is considerable latent demand for chicken meat in the target area. Both the Livestock Project and Small Farming Project introduced the production technology needed to ship more chickens in meat form, and if this technology is developed smoothly it could make inroads into local markets and compete against commercial broilers outside the area. Listing these figures side by side shows that sustained development of PRIDE could result in food products with an economic value of about SAR 50 million that could substitute for imports.

Let us see a micro-economic potential from the perspective of individual farmers. The bakery business promoted in the standard women's project would generate sales of SAR 105 per day. We can assume that each group could generate up to SAR 50,000 in sales per year. This means that if 50 women's groups baked bread in each community of the regions, it could take over the SAR 2.5 million market for manufactured bread. The successful Small Farming Project demonstrated that farmers could each raise their income by a net SAR 6,000 per year through

the integrated farming. If 1,000 farmers in the target area carried out small-scale integrated farming and locally produced potatoes could take over one-fourth of the local market, the production total would be SAR 6 million. The Livestock Project also demonstrated that improvements in the productivity of 10 chickens at each firm generate the additional income of SAR 4,000 for the participating farmers. If all farmers achieved this level, even under a conservative assumption that the average profit would be half of this amount, the success of 3,000 farmers would result in profit of SAR 6 million. The total of micro-economic targets is SAR 14.5 million.

This is quite low compared to the SAR 50 million calculated as the macro-economic target. It can be considered that the SAR 14.5 million figure represents a feasible target while the SAR 60 million represents a theoretical target, with the fruit of future efforts determining the extent to which it exceeds SAR 14.5 million. Given the gaps in terms of technology and capital between the target area and external regions, a strategy promoting exports would not be appropriate in the near future at least. The residents in the target area pay SAR 150-200 million to external commercial farmers and distributors to buy basic food items produced outside of the area. Given this situation, it would be more realistic for local farmers to focus on their own local market rather than trying to compete against powerful producers in markets outside of the area.

In the long term, a strategy involving “brand farming” would be possible. If economic development can bring more prosperity to urban consumers and diversify their values, demand for slow food products will certainly increase. There is little price elasticity in the demand for these products, which could offset the modest transportation costs. Particularly important in this strategy are an environment and techniques that unearth a region’s own resources and take full advantage of the community’s knowledge. This “brand farming” concept could possibly be incorporated as a strategy in the future. A scarcity of water and farming experience and inability to produce on a mass scale may not be a fatal disadvantage. In particular, regions such as the target area, where prosperous urban markets are within one hour’s drive, are the ideal economic environment for the “brand farming” strategy.

The team has mapped out the following four stages to divide the period until 2017.

- Stage 1 Pilot stage corresponding to PRIDE (2004-2007)
- Stage 2 Dissemination stage (2007-2009)
- Stage 3 Expansion stage (2010-2013)
- Stage 4 Brand farming strategy (from 2014)

Stage 1 was the period for this study. In Stage 2, the LDA Sekhukhune district office will take the initiative in continuing with pilot projects so as to ensure those small farming techniques with the most potential. In Stage 3, other LDA district offices in Limpopo province will become involved, and successful pilot projects will be replicated and the activity area expanded significantly. There will have to be an increase in the numbers of projects and participating farmers. The community must take the initiative with help from stakeholders. The leading role in this development will gradually shift from external aid organizations such as LDA to the community, which should give the residents a greater sense of ownership over the development projects. In Stage 4, the unique aspects of each farmer and community will be brought into focus and branded under “brand farming” strategy, based on all of the development experience that has been built up thus far. Yet, the adoption of brand farming still appears farfetched, and it will look more realistic only when Stage 3 is successfully completed.

19.4 Social Dimension

One important piece of information learned in this study was that if a farmer group formed with less than 15 members, the group tends to be run relatively well. Since the local farmers are not skilled at running groups, when such group activities are required it is wiser to keep the number of members as low as possible.

Multiple experiences of small successes in which farmers master each step help improve their skills. Experiences of success give farmers the confidence they need to take the next step and challenge themselves to take up a new endeavor. In particular, it should be emphasized that PRIDE has been able to confirm that farmer-to-farmer training is an extremely effective methodology for disseminating technology. In the case of farmer-to-farmer training, the instruction is provided by actual practitioners so it is not only practical, but there are no obstacles in terms of language or culture. Further, it should be noted that farmer-to-farmer training results in significant psychological growth for the trainer as well as the trainee. This clearly demonstrated the importance of empowerment based on pride and a sense of solidarity.

19.5 Political and Administrative Dimension

The devolution currently underway throughout RSA is an extremely important political issue. While it is true that the first foundation for devolution policies must be the existence of communities with the ability to govern themselves, unfortunately this foundation is weak in the target area. As a result, conscious efforts to strengthen this base are essential.

Another issue is the government’s double-layered structure, consisting of the democratically

elected local government organization and the traditional chief system. An exhaustive discussion of the problems of this double-layered government is beyond the scope of this study. However, it should be noted that some of the traditional chiefs are very knowledgeable about local development needs due to their daily contact with residents. The only solution is to devise development ways that will be well received by the residents and that are suited to the political realities that differ in subtle ways between communities.

As described above, the inadequate organizational capacity of LDA time to time caused shortcomings in the course of implementing PRIDE. LDA's challenge in this regard is still critical, including the sense of ownership in the project, efficient project management and accurate evaluations of officers' performance.

Department of Health and Social Development as well as LDA should immediately stop giving materials and money to some residents' groups without long-term consideration. Investment plans should be altered so that they provide matching funds, rather than entire grant funds, and require residents' groups to take considerable responsibility, increasing aid amounts in stages.

20 Implication of this Master Plan to ASGISA

The development strategy mentioned above and project idea of CEP described in the following share the same philosophy with ASGISA which is the current overall development framework of the government of RSA. Following table summarizes the relevancy of the basic strategic concept for smallholder development discussed in this report and the framework of ASGISA.

ASGISA and Smallholder development

ASGISA in Agriculture	For Smallholder Development
Economic infrastructure, Broad Based AgriBEE, and Food Security	Materials necessary for small scale farming system, range land protection, community soil conservation, rehabilitation of vegetation.
Sector investment, Labor absorbing and Value chain	Promotion of low-cost labor intensive simple farming technologies, differentiation of produce and "Brand agriculture," appropriate micro-credit.
Human resource development, Research, Extension and Training	Formal training at Tompi Seleka combined with grass roots training at advance farmers' fields.
Mainstreaming of the "Second Economy"	Substitution of existing local market dominated by commodities coming from the "First economy"
Capacity building of the government institutions and partnership	Mentor farmer partnership and "Farmer to farmer" extension.

21 Centers of Excellence Project

CEP is composed of two phases, two and half years for Phase 1 and five years for Phase 2. In the most recent development, LDA Sekhukhune district office has begun “PRIDE 2,” which is more or less equivalent to Phase 1 of CEP, and they are still in strong need of external expert support in the subjects of project management and small-scale farming technologies.

The economic and environmental goals of CEP would be achieved in tandem with socio-psychological progress in terms of enhancing the sense of ownership and getting rid of dependency mind set among the target population. Followings are the direct project purpose of CEP.

（1） Realization of sustainable livelihood improvement through development and dissemination of models for farming, livestock production and other income generating activities applicable to socio-economic as well as natural conditions of designated nodal points within the province.

（2） Improvement of environmental status of communal lands by introducing the participatory management of rangeland to prevent over-grazing and by promoting community initiative to set out community forests and to address the issue of soil erosion.

（3） Consolidation of participatory approach in rural development with tangible and sustainable results of project activities and improvement of people’s sense of ownership and self-reliance.

（4） Establishment of institutional mechanisms of delivering knowledge and experience to rural residents.

（5） Awareness raising among extension officers on the main concept of small-scale farmer development underlying CEP that smallholder development should be based on promotion of low cost integrated farming system and human development of rural farmers.

（6） Dissemination of project experience to other districts within the province and even to other provinces.

Target areas of CEP include at least five municipalities of: 1) Fetakgomo municipality in Sekhukhune district; 2) Makhuduthamaga municipality in Sekhukhune district; 3) Marble Hall municipality in Sekhukhune district; 4) Blouberg municipality in Capricorn district; and 5) Maruleng municipality in Bohlabela district, however, it does not restrict further application of CEP in other semi-arid poverty areas of the province.

22 Phasing of CEP

Phase 1

The goal of Phase 1 is twofold; the first is to ensure a gradual but steady expansion in project activities in Fetakgomo, Makhuduthamaga and Marble Hall municipalities in order to further prove the usefulness and practicality of the CEP activities. The second is to prepare a project feasibility report needed for the implementation of Phase 2. Implementation period of Phase 1 is from April 2007 till September 2009.

Phase 2

During Phase 2, CEP would proceed to include at least two new municipalities: namely, Blouberg municipality of Capricorn district, Maruleng municipality of Bohlabela district. Furthermore, necessary arrangements would also be made to facilitate a gradual spill-over of CEP activities to other municipalities of Limpopo province and even outside the province. Implementation period of Phase 2 is from October 2009 till September 2014.

23 Components of CEP

23.1 Small agriculture component

During Phase 1, the farming model developed by 0.1ha Integrated Farming Project of PRIDE would be further tested and tuned to secure its technical appropriateness and economic viability in small farm context in the three municipalities in Sekhukhune district. Minimum of additional 600 farmers are expected to participate in this activity, and 200 of them or more would actually realized profit in Phase 1.

23.2 Livestock production component

Based on a technical package formulated by PRIDE, Phase 1 would aim to disseminate the improved technology to the larger number of farmers in the three target municipalities. The expected number of additional beneficiaries would be in the range of 600 or more.

23.3 Community woodland conservation component

In addition to the village nurseries built under PRIDE, four more nurseries would be launched at as early a timing as possible. CEP would invite any communities of the three municipalities to come into agreement with LDA for creating 20 new community forests of about 3 ha each within their communal premise.

23.4 Micro-Credit component

Participating NGOs of a reputable truck record would be identified. They would help the

farmers who successfully completed CEP training program organize themselves into borrower's solidarity groups. Subsequently, provided that the solidarity group concurs a loan to a farmer, the NGOs would lend small loans to him/her and would gradually raise credit line according to the performance of individual borrowers and solidarity groups. The participating NGOs in turn would be provided with seed fund by CEP.

23.5 Women's Group and Youth Group component

On a group by group basis, CEP would scrutinize the purpose and leadership capacity of groups and render support to their activities whatever deems reasonable from business point of views.

23.6 Feasibility Study of Phase 2 component

Last but not least, during Phase 1, the Project Implementation Unit of CEP would have to complete a feasibility study regarding Phase 2 and produce a project document quality of which meets the international standards to secure larger development funds and necessary expertise to implement Phase 2 in full scale.

24 Indicative Cost of CEP

Phase 1 of CEP requires SAR 3 million per year and it sum up to SAR 7.5 million for 2.5 years of Phase 1. The figure of SAR 75 million would be required for Phase 2, based on the calculation that SAR 15 million of costing for each year is multiplied by 5 project years of Phase 2. This in the meantime remains indicative only and should be estimated thoroughly through the feasibility study.

25 Master Plan for Soil Conservation in Sekhukhune District

25.1 Basic Policies in Formulating the Master Plan

(1) Promoting a participatory approach in community-based activities
(2) Combining LDA-led activities with resident-led activities
(3) Promoting extension activities
(4) Promotion of capacity building and organizational development
(5) Incorporation of greening promotion and environmental education

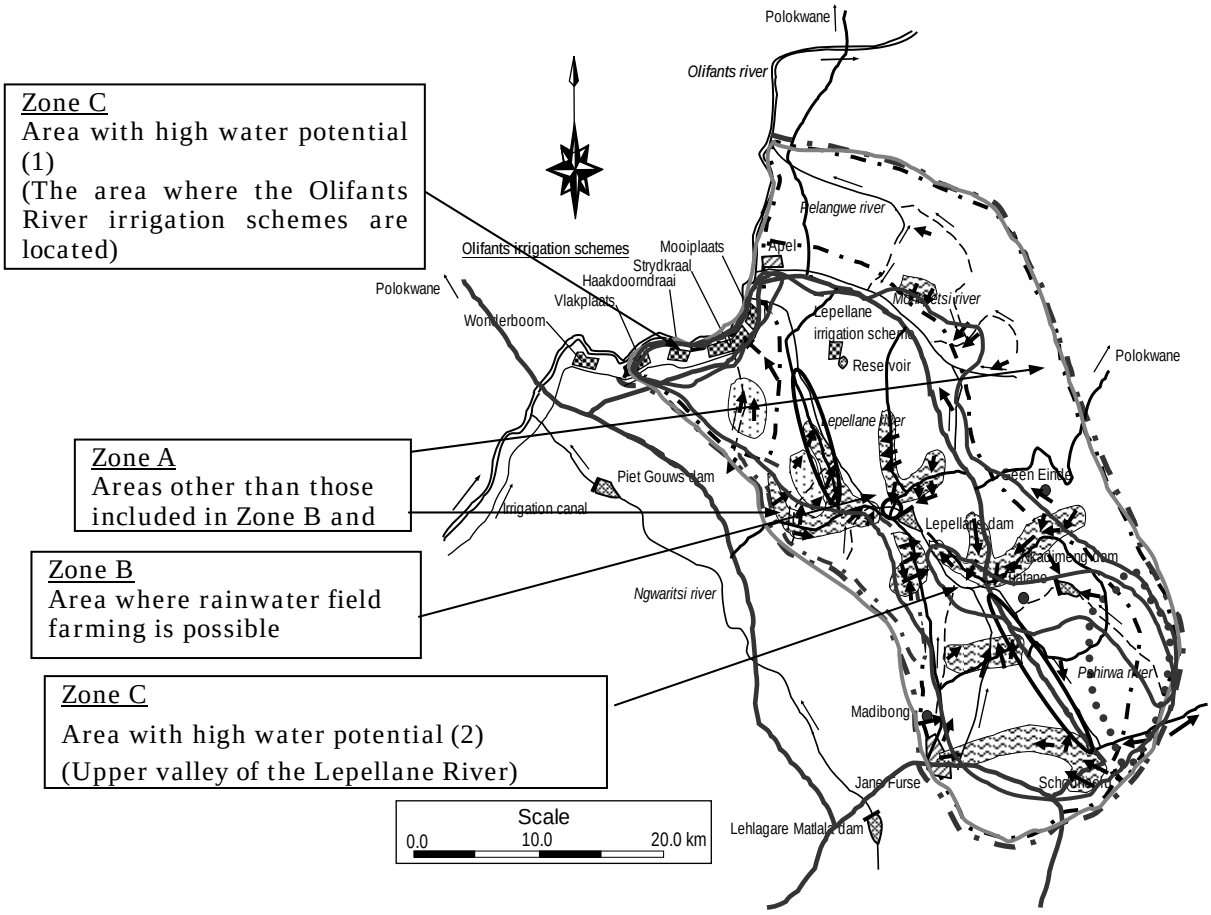
25.2 Framework of the Master Plan

The basic strategies, the activity components that should be included in the soil conservation master plan can be summarized in the following table.

Activity components of the Soil Conservation Master Plan

Activity field \ Activity type		Soil conservation/Facility improvement	Greening promotion/Environmental education
Main activities	LDA-led	Facility improvement • Improvement of the Lepellane dam • Improvement program for small-scale dams	Greening activities • Designation of greening areas • Control of soil runoffs and erosion aggravation in the vicinity of waterways and dongas • Promotion of community forestation Environmental education activities • School forests • Promotion of school extracurricular activities
	Community-based	Soil conservation activities • Community soil conservation	
Support activities		Capacity building and organization development • Organizational development of the Head Office and district offices • Training of extension officers • Training of community members Extension activities • Utilization of the Mobile Information Units • Use of demonstration sites and field visits	

When implementing the above components, attention must be paid to the geographic specificity in the target area. The purpose of area zoning is to break the target area down into several zones and typify the activities for each zone.



Area zoning

Activity types for each zone

Zone \ Activity field	Production activities	Soil conservation activities	Greening activities
Zone A	Managed grazing (Strengthening of livestock farming groups)), Rainwater/extensive farming, Irrigation/intensive farming (0.1 ha combined farming)	LDA-led facility improvement, Geen Einde model, The PRIDE model, Community soil conservation	Community-led, Greening activities (Community forestry)
Zone B			
Zone C			

Note: ( ) show the pilot project corresponding to each activity in this study.

Activities included in the master plan are implemented according to a time frame consisting of a pilot stage, an extension stage, and an autonomous stage.

Stage	Activity objective
Pilot stage (2004-2006)	Model establishment (design, process, implementation, and maintenance systems)
Extension stage (2007-2012)	Extension to a large number of communities
Self-sustaining stage (2013-2017)	Improvement of problem-solving and implementation ability in target communities

The following technical model is used in the design of construction works for soil conservation.

- Damage caused by floods and soil runoffs is minimized and erosion aggravation is prevented through the construction of storm water banks, waterways, and contours. In addition, waterways are protected from flood-caused erosion through the construction of waterway protection structures.
- Storm water banks, contours, waterways and other structures are protected from flood-caused erosion through forestation and planting. In order to secure long-term continuity of these activities, local people's awareness of the need for environment protection is raised through their participation in forestation and planting works.
- Fences are built in order to protect the vegetation from cattle and to contribute to its recovery.
- Construction works for tree nurseries may be added optionally when target communities wish to produce seedlings as a way of contributing to soil conservation and greening activities in neighboring areas, or as a way of earning additional income.

Two types of layout design are available, in accordance with their intended use: the PRIDE type and the Geen Einde type. Both designs serve to receive floodwater and soil runoffs from mountain areas through a bank system, and rainwater through a contour system, channeling them safely through waterways towards downstream areas.

The standard processes for planning, design, and construction. A brief overview of the processes is given below.

- 1st year – Preparation phase: Applications from communities, screening, and selection.
- 2nd and 3rd year – Implementation phase:
  - 2nd year: Creation of participatory plans; completion of waterways and waterway protection.
  - 3rd year: Storm water banks, contours, forestation and planting, and fence completion.
- From the 4th year - Maintenance phase: Maintenance of completed structures, forestation and planting.

LDA and community members implement the project based on the following role demarcation.

- Community members: Actors of planning, implementation, and management activities
- Extension officers: Instructions and guidance to residents
- District office: Arrangements for various activities
- Head Office: Technical and financial support

The total budget estimated for all the activities is SAR 41.9 million. RSA 5.3 million to RSA 6.3 million is necessary for one year in the “extension stage,” which sum up to the total of RSA 35.4 million during the period until year 2012. The first year of the “self-sustaining stage” require RSA 3.3 million, however, RSA 0.8 will be necessary after years until year 2017. The total of RSA 41.9 million is estimated for the “self-sustaining stage.”

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Part 3 PRIDE in SEKHUKHUNE

Part 4 MASTER PLAN

Part 1 INTRODUCTION

Chapter1 Overview of the JICA Study

1.1 Background of the Study

The Republic of South Africa (RSA) has sought to promote socio-economic empowerment among its black population as a post-apartheid political challenge. Two requirements to meet this challenge in rural areas are maintenance of basic social infrastructure and smallholder development to create sustainable income generation activities. The Government of RSA requested the Government of Japan to conduct a study (the Study) jointly with Limpopo Province Department of Agriculture (LDA) in order to initiate sustainable development in one of the country's identified poverty nodes - Sekhukhune District in Limpopo Province. The Study commenced in October 2002.

1.2 Target Area

The target area of the Study is used to be referred as "Schoonoord Area," which is nearly identical with the catchment area of the Lepellane River within Sekhukhune District and including 85 villages. This area is split into two Local Municipalities of Fetakgomo and Makhuduthamaga.

In addition, to see if the technical model of the pilot projects is workable outside the target area of this Study, the JICA consultant team (the "team") carried out simple fact-finding surveys in the following local municipalities: Greater Marble Hall Local Municipality in Sekhukhune District; Blouberg Local Municipality in Capricorn District; Thulamela Local Municipality in Vhembe District; and Maruleng Local Municipality in Mopani District. The municipalities above are not the target area of this Study.

1.3 Purpose of the Study

The ultimate goal of the Study is to help realize economically and socially active rural communities equipped to be responsible for their own development. The goal is to be pursued through smallholder development to create stable income sources and improve living standards in the target area of semi-arid and poverty area. The Study will prepare a Rural Development

Master Plan (M/P) covering such subjects as introduction of soil conservation, agricultural development, consolidation of basic social infrastructure and improvement of livelihoods.

1.4 Structure and Process of the Study

As shown in Figure 1-1 below, the Study consists of two phases and has been implemented from 2002 to 2007. In the first phase, the team conducted basic studies on natural resources, crop production, livestock, soil conservation and conditions of other factors in the target area. The team has used the results of the basic studies in formulating eight project proposals that the team believes are effective for agricultural development in the target area, and then implemented in the second phase the eight proposals as pilot projects. Lessons and information obtained through the implementation of the pilot projects are also the foundation of the M/P that this report elaborates.

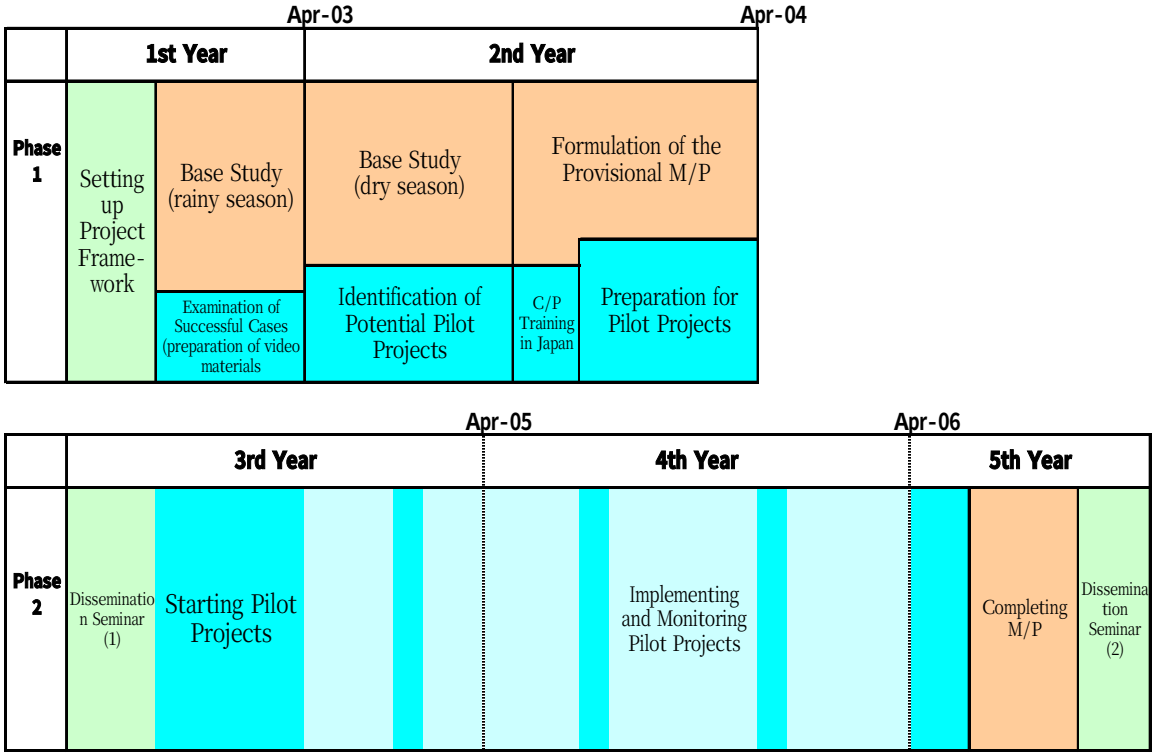

Figure 0-1 Overall Structure of the Study

First Year (October 2002 – March 2003)

The first year is the preparatory stage of this Study. Prior to launching the Study, the Study team and the JICA staff members responsible for this Study discussed with LDA in October 2002 the

contents of an inception report on objectives and methodologies of the Study. Based on the discussion, the Study team formulated the final version of the Inception Report and agreed with LDA on its contents. Meanwhile, the Study team began in January 2003 the basic survey in the target area by the team members and carried out the village profiling survey to grasp the current state of the daily lives of inhabitants.

Second Year (April 2003 – March 2004)

In the second year, the main activities of the Study were the continuation of the basic survey and the formulation of a provisional Master Plan (M/P). A local survey was carried out twice, once during the dry season and again during the rainy season, to gain a better sense of conditions in the target area, and a study of the village's needs was conducted using participatory methods. In addition, proposals for pilot projects due to be implemented from the third year were considered, and a "Provisional Master Plan" was prepared, laying out the study team's ideas for developing the target area in light of the previous studies' results.

Also in the second year, the counterparts received training in Japan. This training was broken into two courses: "counterpart training" for mid-level managers and "South Africa-Specific Training" for extension officers.

Third year (April 2004 – March 2005)

The third year and thereafter is considered to be Phase 2 of this study, with the main activities being implementation of the pilot projects, completion of the M/P. Based on the pilot project proposals described in the "Provisional Master Plan" prepared in the second year, a detailed plan for the pilot projects and the target villages were decided after discussions with the municipal government in the target area. More specifically, the following eight pilot projects were considered.

- 0.1ha Integrated Farming Project
- Livestock Owners Group Support Project
- Community Soil Conservation Project
- Community Forestry Project
- Women Business Promotion Project
- Practical Farmers' Training Project
- Mobile Information Unit Project
- Local capacity development project

In February 2005, an “Interim Seminar” was held to introduce the “Provisional Master Plan” and explain the progress made in the pilot projects to the LDA and other related organizations. The first day of the seminar consisted of a report and panel discussion with the study group through a video hook-up, and on the second day the participants visited the sites of the pilot projects. Many seminar participants visited the sites of the 0.1 Integrated Farming Project, the Community Soil Conservation Project, Women Business Promotion Project, and the Mobile Information Unit Project. This enabled them to see for themselves the outputs being generated by these pilot project.

Counterpart training was planned for the third year as well, but it was cancelled because reforms in the LDA organization made it difficult to select appropriate trainees.

Fourth year (April 2005 – March 2006)

In the fourth year, the aforementioned pilot projects continued to be implemented. While most of the pilot projects yielded results, the construction for the Community Soil Conservation Project ended up back at square one because of LDA’s delays in dispensing the budget and a flood in the target area in March 2006. Since it was difficult to get a supplementary budget from JICA with which to resume the construction, the construction started up gain in the fifth year on the LDA budget. Also, the Local Capacity Development Project had initially planned to carry out activities that would improve the management capacity of counterparts and municipal government employees in the target area with the aim of supporting other pilot projects. However, this did not lead to specific results due to difficulties such as institutional problems related to organizational reform and personnel transfers within LDA as well as differences between the fiscal year of LDA and the municipal government.

LDA has high praise for the pilot projects’ output up until this point and would like this study’s activities to be continued and expanded as the “Centers of Excellence Project” (CEP). Accordingly, the Study team prepared a plan for the specific activities that would be continued in the Sekhukhune district and also to examine the possibility of expansion into the three districts other than the Sekhukhune district discussed above.

In the fourth year, the two training sessions in Japan offered in the second year were given again. The “South Africa-Specific Training” selected trainees from the LDA’s district office in districts other than Sekhukhune region on the assumption that CEP would be implemented. Also, in the counterpart training, candidates for the CEP project coordinator position at the Sekhukhune district office were selected as trainees.

Fifth year (April 2006 – March 2007)

The main activities in the fifth year, the final fiscal year for the project, were evaluation and handover of the pilot project, support for the start of CEP and compilation of the final report. The initial plan had intended to finish all activities in November 2006, but this study was extended through March 2007 because it was decided that support would be needed for one more rainy season (November 2006 – February 2007) to ensure the pilot project's sustainability after the study and time was needed to help start up CEP.

In anticipation of this study's completion, efforts are being made to ensure the independence of the farmers and groups targeted in each pilot project. The evaluation conducted in tandem using the participatory approach indicated that many projects yielded extremely strong results. The Community Soil Conservation Project was handed over to LDA from the fifth year, and was completed at the end of January 2007.

CEP was officially authorized by LDA, and in the first phase the base for activities in the Sekhukhune district was to be formed. The Study team assisted the Sekhukhune district office, and preparations for actual CEP activities moved forward. In November 2006, farmer training at the Tompi Seleka Agricultural Training Center was carreid out.

In February 2007 the final seminar was held, with presentations on the study's final results as well as proposals on small farmer development strategies in Sekhukhune district and similar semi-arid impoverished regions. The seminar lasted a half day and consisted of 1) overview of this study, 2) viewing of video introducing this study's activities, 3) the pilot projects' outputs and lessons, 4) proposals for agricultural development in Limpopo province, and 5) question-and-answer session. LDA staff, staff from other related government organizations such as the Department of Health and Social Development, local municipal government staff in the target area, representatives of farmer groups and NGO staff participated in this seminar.

1.5 Deliverables

During this study, progress reports detailing the study's progress, an interim report explaining the study team's ideas for development in the target area and an overview of its proposals when the basic study was finished, and a final report compiling the final conclusions of this Study were prepared as deliverables. In addition, deliverables such as manuals and introductory videos were prepared as the pilot projects moved forward.

1.5.1 Interim report

When Phase 1 of this Study finished, an interim report was prepared. This report included the results of the basic study in the target area, the "provisional master plan" based on the study results and a description of the specific project plan for the "pilot projects," proposing implementation from the third year.

1.5.2 Progress report

The six progress reports below were prepared during the study period.

Title	Date	Description
Progress report (1)	March 2003	Developments and results from the study's start to the basic study during the rainy season in the second year
Progress report (2)	August 2003	Activities and results up through the dry season study in the second year
Progress report (3)	September 2004	Developments up through the start of the pilot project in the third year
Progress report (4)	February 2005	Progress of pilot project and other activities at end of the third year
Progress report (5)	November 2005	Progress of pilot project and other activities in middle of the fourth year
Progress report (6)	March 2006	Progress of pilot project and other activities at end of the fourth year

1.5.3 Final report (this report)

The "final report" refers to this report, which describes the Study in its final phase. This report is structured as follows:

Part One: Introduction
- Chapter 1: Overview of this development study
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Chapter 11: Master Plan for soil conservation in Sekhukhune district

1.5.4 Other Deliverables

In addition to the aforementioned reports, the deliverables listed below were prepared during this study period. These deliverables are compiled as a supplementary volume appended to this report.

- Proposal for small scale bread-baking business model
- Guidelines for running training for “Practical Farmer Training Project”
- Manuals for Small-Scale Integrated Farming techniques
- Operational manuals for the particiatory soil conservation
- Work Breakdown Structure (WBS) of Centers of Excellence Project (CEP)
- Introductory video for pilot projects (revised edition in 2007)

Chapter2 General Information of the Target Area

2.1 The National Economy

2.1.1 Population

Statistics South Africa estimates that the total population of South Africa is about 47.4 million in mid 2006, of which about 24.1 million, or 51%, are women. About 80% of the population are African, and the remainder are 9.2% white, 8.9% are colored and 2.5% are Indian and Asian. The World Bank (WB) had predicted that the population would reach 45.8 million in 2015, but this forecast had already been far exceeded as of mid 2006. The annual population growth rate was about 2.1% from the 1980s, but had continued to decline since 2001, falling to 1.06% from 2005 to 2006 (1.09% male and 1.02% female).

The Kwazulu-Natal province, which is home to the city and port town Durban, the third largest after Johannesburg and Cape Town, holds 20.9% of the total population. This is followed by Gauteng province (20.1%) and Eastern Cape province (14.6%), with the smallest population in the Northern Cape province. There has been little change in the population breakdown by province since 2001.

The population is increasingly concentrating in cities and towns and depending less on agriculture for livelihood. Industrialization and urbanization are having substantial impact on the rural and agricultural populations, which have fallen both as a proportion and in number. The rural population fell from 18.8 million (51% of total population) in 1990 to about 17.78 million in 2001 (42%). Similarly, the number of people depending on agriculture for sustenance fell from 7.1 million (19%) to 6.0 million (14%) between 1990 and 2000.

2.1.2 Economic structure and growth

RSA has a significant economy, with the WB estimating its gross domestic product (GDP) in 2002 as USD 104.2 billion and ranking it as 35th largest of the 182 countries in its indices. This by far the largest economy in Southern Africa, with the next being Angola (USD 11.4 billion, ranked as 84), Botswana (USD 5.2 billion, ranked as 110) and Mozambique (USD 3.9 billion, ranked as 117). RSA rates much lower among countries in terms of gross national income (GNI) per person, which the WB estimates at USD 2,600 for a ranking of 94. Among the neighbors, diamond-rich Botswana has higher GNI per person, at USD 2,980 for a ranking of 89.

RSA's economy is highly diversified and is moving increasingly towards to "post-industrial"

status, with tertiary industries now contributing about 65% of GDP (Table 2-1 attached to the end of this chapter). The three largest tertiary industries are finance, real estate and business services (19-20% of GDP), general government services (15-16%) and wholesale and retail trade, restaurants and hotels (13-14%). Secondary industries contribute about 25% of GDP, with the bulk coming from manufacturing (18-19% of GDP). Primary industries consistently contribute 10-12% of GDP, with mining and quarrying providing 6-7% and agriculture, forestry and fishing 3-4%. Production per person is clearly far lower in agriculture than elsewhere in the economy, with about 14% of the population engaged to produce its modest share of national income.

Annual real growth of the economy averaged 2.8% from 1994 to 2002, ranging from a high of 4.3% in 1996 to a low of 0.8% in 1998 (Table 2-2). Especially high growth was driven by the tertiary industries except government services. Agriculture sector growth was modest from 1994 to 2002, averaging about 1.3% annually and with very large fluctuations caused by climate and international commodity prices – ranging from a high of 29.0% in 1995 to a low of -23.5% in 1996.

Contributions to GDP differ widely among the nine provinces of RSA (Table 2-3). By far the richest provincial economies are those of Gauteng province which has about 20.1% of the nation's population but generates 33-34% of GDP and Western Cape Province which has about 10% of the population and 14-15% of income. Limpopo and Eastern Cape provinces have the worst shares of GDP – the former's 11.3% of the population produce only about 6% of GDP and the latter's 14.6% of population earn 8% of GDP.

2.2 Limpopo Province

2.2.1 Geography

Limpopo is the northernmost of the nine provinces of RSA. The province shares borders with Gauteng, Mpumalanga and North West provinces to the south, Mozambique to the east, and Zimbabwe and Botswana to the north. It has an area of 134,520 k m^2, which is 10.2% of the country's total land area. It contains the apartheid era's Northern Transvaal and three homelands of Lebowa, Venda and Gazankulu. The former homelands make up about 30% of the provincial area, and about 90% of the provincial population. Limpopo's population is about 5.365 million (about 12% of the country's total population), of which 97% is African, the highest percentage of any province.

Source: Municipal Demarcation Board

Limpopo has the following five districts: Capricorn; Vhembe; Waterberg; Mopani; and Greater Sekhukhune (the former Bohlabera district was integrated a part into Mopani, and the other into Mpumalanga Province in 2006). The provincial capital of Polokwane is an independent administrative area, but located in the southern part of Capricorn district. Sekhukhune district, where the target area of this study, is located, is in the southern part of Limpopo province.

Source: Municipal Demarcation Board

References: http://www.demarcation.org.za

Mid-year population estimates, South Africa 2006 (http://www.statssa.gov.za)

2.2.2 Economy

(1) Economic structure and growth

Limpopo Province's economy is structured similarly to that of RSA as a whole, with some important differences. Primary industry is far more important to Limpopo than to the whole nation, generating 23-24% of province product (Table 2-4), compared to 11-12% for RSA. Within the primary industries, mining and quarrying is far more important, providing 21-22% of province product than agriculture, forestry and fishing, which add up only to 2-3% of province product. The major structural difference between Limpopo's economy and that of RSA is that its secondary industries are far less important, generating only 8-9% of the province product compared with the national performance of 24-25%. This difference lies almost wholly in the performance of manufacturing which accounts for 18-19% of output for the nation but only 3-4% of that for the province. The structure of tertiary industries in Limpopo is very similar to that for the nation and contributes about 60% of province product.

Despite its low position in economic ranking among provinces, Limpopo Province has enjoyed the highest growth rate of all provinces since 1996, with its output increasing by an annual average of 4.0% between 1996 and 2002, while the national economy averaged 2.8% (Table 2-5). Primary industries have done well with mining and quarrying output rising by an annual average of 3.7% and agriculture, forestry and fishing by 5.6% during the same period. The transport and communications industry is growing very rapidly, averaging an increase of 12.8% annually.

2.2.3 Household economy

The latest available study of household income and expenditure is reported by Statistics South Africa in "Measuring Poverty in South Africa" published in 2000. The study compares population estimates from the 1996 census with estimates obtained from the income and expenditure survey (IES) in the same year. While there were some differences in the results from the two methods, the overall conclusions are the same for both (Table 2-6). The ranking of provinces by household incomes was very similar and both methods found Limpopo and Eastern Cape to be the poorest provinces. The census found that Limpopo Province had a very high proportion of households (72%) and of individuals (80%) below the respective poverty lines of SAR 800 and 250 per month. The IES found a far lower proportion of households (36%) and of people (58%) in Limpopo Province below the poverty lines. Statistics South Africa cautions that the census data understate incomes and that care should be taken in using them for policy purposes. Nevertheless, the two methods indicate that Limpopo is one of the poorest provinces and has high incidence of poverty.

Average monthly consumption expenditure for households in Limpopo Province was also the third worst, at SAR 1,855, just above Free State (SAR 1,819) and Eastern Cape (SAR 1,702). “Measuring Poverty in South Africa” gives poverty maps by district. Average monthly expenditure for Limpopo Province’s districts ranges from SAR 7,577 down to SAR 1,300. The incidence of poverty for the districts ranged from 48% down to 14% and Sekhukhune ranked seventh highest, with 42% of its people in poverty.

2.2.4 Poverty alleviation policy

As stated in 2.2.2, Limpopo province 2.2.2, Limpopo Province has been enjoying a favorable economic growth mainly driven by mining and agricultural sector, and at the same time, is still holding serious problems of high poverty rate and unemployment. “Provincial Growth and Development Strategy (PGDS) 2004-2014” analysis this “dual economy.” PGDS identified following five development goals, based on its economic analysis.

（1） Improvement of quality of life
（2） Economic growth, sustainable job creation, innovation and competitiveness
（3） Improvement of efficiency and effectiveness of the provincial government institutions
（4） Black Economy Empowerment, care for HIV/AIDS, poverty alleviation, environmental conservation
（5） Attainment of regional integration

These development goals can be structured as follows. The ultimate goal of the policy is (1); three main strategies to achieve the ultimate goal are (2), (3), (5); and (4) is a cross cutting issue underlying all the priority areas. These five development goals are further sub-divided into “objectives.” For example, the development goal (1) has objectives of 1) human resource development, 2) improvement of health conditions, 3) eradication of crime and corruption; the development goal (2) has job creation and investment promotion; and the development goal (3) has capacity development of provincial government and municipal government as their objectives.

PGDS further shows seven development clusters as strategic area of intervention. PDGS analyses that main driving forces of the economy of Limpopo Province are mining, agriculture, tourism and manufacturing. Based on this analysis, PGDS emphasizes priority interventions should be given to the areas, which identified to have competitiveness in these priority industries, and such areas are referred to the as “cluster.” All stakeholders including private enterprises of upstream to down stream of the industry, as well as relevant public institutions for

research and training will be involved in the cluster development. Through this cluster development, PGDS expects that integrated development of industry and job creation will be achieved, and consequently, poverty alleviation will be realized. Specific development clusters identified by PGDS are follows.

（1） Platinum mining cluster
（2） Coal mining and petro-chemical cluster
（3） Fruit and vegetable (horticulture) cluster
（4） Logistics cluster
（5） Meat production cluster
（6） Tourism cluster
（7） Forestry cluster

PGDS identified five necessary measures to develop the seven clusters, i.e. 1) education and skill development; 2) provision of basic infrastructure; 3) capacity development based on scientific technologies; 4) open access to capital market; 5) improvement of institutional efficiency. PGDS emphasizes that once these measures are taken, improvement of productivity, acceleration of innovation and creation of new business will be realized, and then competitiveness of each cluster will be strengthened. PGDS concludes that cluster development will lead to regional economic development, creation of business opportunities for small and medium entrepreneurs, black economy empowerment, gender equality, and cost effectiveness of development investment.

There is another side of poverty policy in RSA. As a part of social welfare programme, the government provides old-age pension, child support grant and food parcel. All these programmes are undertaken by Department of Health and Social Development (DHSD). Old-age pension is SAR 820 per month and given to men of 65 years old or higher, and to women of 60 years or higher, until his/her death. Child support grant is given to a single mother with no income, who has a child of new born till 14 years, and amount is SAR 190 per month (as of December 2006). Since job opportunity is very limited in most of rural area in RSA, there are many families which substantially depending on these government welfare programme, and not a small number of families have pension eligible elders as the biggest earners among the family members. There is even an unconfirmed information that visible number of women want to have child only because for the child support grant. DHSD operates pension delivery cars in rural areas such as the target area, where there is no government office in the area. The delivery car visit monthly to the areas and stop at various points called “pension-pay-point.” Finally, the

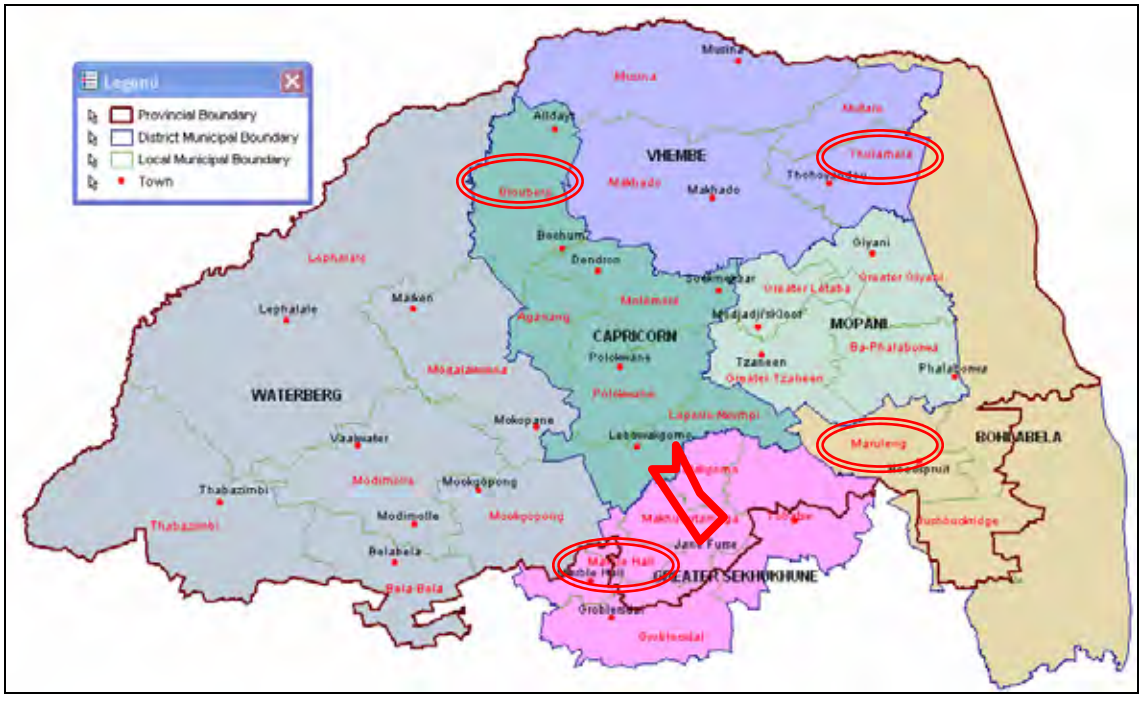
food parcel is given to a household which has extremely low income. Main contents of the parcel are maize meal and other basic food.

2.3 Overview of Impoverished Rural Regions

2.3.1 Background and study methods

This section will provide an overview of the target area of this study, as well as an overview of the four municipalities that LDA selected as potential sites for the "Centers of Excellence Project" (CEP, see the Part 4, Chapter 10). The descriptions of the target area are based on the results of the study conducted by the study team itself in the first and second years. The overview of the other municipalities is a summary of the results of a basic study carried out by a local consultant commissioned for that purpose in the fourth year. The four municipalities selected as CEP candidates are Marble Hall (Sekhukhune district), Blouberg (Capricorn district), Thulamela (Vhembe district) and Maruleng (Bohlabela district). Figure 2-3 below depicts the location of the cities. The full results of the basic survey conducted in these four cities are appended to this report.

Figure 2-3. The target area and the four candidate municipalities of CEP



2.3.2 Economic Conditions in the Target Area

(1) Sekhukhune district

The Sekhukhune district is located in the southern part of Limpopo province, and consists of the four municipalities of Fetakgomo, Makhuduthamaga, Tubatse and Marble Hall. The map above would seem to indicate that Groblersdal is also part of the Sekhukhune district, but the bold line indicates the province's border and shows that Groblersdal is a "cross-border municipality" that is under the joint jurisdiction of Limpopo province and the neighboring Mpumalanga province.

The Olifants River runs along the northern border of the Sekhukhune district, making water available throughout the year and serving as the region's largest water source. Many of the feeder rivers to the Olifants River—including the Lepellane River, which runs through the target area—dry up in the dry season.

The national government in early 2001 identified 13 areas with extreme poverty and lack of services and facilities to be targeted for accelerated rural development; these "nodal area" include Sekhukhune District. Statistics South Africa in June 2001 carried out a "social development indicators survey" to provide baseline information on the nodal areas. The results give some indications of the conditions of Sekhukhune District.

Labor force statistics indicate that there is very low economic activity in Sekhukhune District (Table 2-7 attached to the end of this chapter). Only 31% of its adult (16-65 years) population is economically active, compared with 41% in all the nodal areas and 59% for the entire RSA. The unemployment rate is 46% for Sekhukhune, 34% for all nodal areas and 26% for RSA.

A high proportion of households (38%) in Sekhukhune District records pensions and grants as the main source of income, while 29% rely mostly on remittances and 21% on salaries and wages (Table 2-8). Only 1.2% of households in Sekhukhune District were recorded as having farming as their main income source. These figures are similar to those for the total 13 nodal areas.

Sekhukhune District's reliance on grants is shown by 61% of its households receiving some form of welfare assistance (Table 2-9). The major grant is old age pensions while child support grants are received by 12% of households. Household incomes are very low in the District, with 84% of households having received less than SAR 800 (poverty line income). This is a little higher than the average for nodal areas (77%) and much higher than the national figure (51%).

Workforce data in the Integrated Development Plans (IDPs) for Fetakgomo and Makhuduthamaga Local Municipalities show that the economy of the target area is poorly developed (Table 2-10). Unemployment is very high and occupations come mainly in the public sector.

The overall conclusion is that the economic activity in the target area is very limited and that there are now no major sectors or industries which can drive high growth. Low incomes and high unemployment lead to low savings and shortages of funds for investment within the area. In reality, external intervention is indispensable to undertake investment to stimulate the area's economy.

(2) The target area

The target area of this study is in the river basin of the Lepellane River, a tributary of the Olifants River, including the eastern half of Fetakgomo and one-third of Makhuduthamaga (the portion circled in red in Figure 2-3). This section will just provide a brief overview as more detailed information on the target area is provided beginning in Chapter 3.

The target area is about 1,200 km^2 in area and includes 85 villages with an estimated population of about 180,000. With the exception of the steep range of hills in the east forming the dividing line and the Leolo plateau in the south-east, the region is flat with a gentle slope extending toward the Leppelane River. The rainy season generally lasts from the latter half of October until February of the following year, with annual rainfall of 400-600mm, but recently the rainfall has been less than this, with two droughts during this study period alone. The average highest and lowest temperatures during the year are 27.5℃ and 7.0℃, respectively. The vegetation consists of mixed shrubs, primarily acacia, but it is being increasingly depleted throughout the area as the result of overgrazing and logging. As the vegetation decreases, the soil is also increasingly eroded, and there are signs of surface erosion and gully erosion, called "donga."

GDP figures indicate that the service industry accounts for a high roughly 50% of industry in the target area, but this is likely because the statistics do not include subsistence farming, and in reality the majority is unemployed (relying on government aid or money sent from family) or work in agriculture. The village profile study conducted in this study indicated that about 70% of the population of target of this study was unemployed. The agricultural industry consists primarily of grain such as millet and cattle breeding, with maize grown in the southern part of the target area and on the Leolo plateau.

The average annual revenue of the households surveyed in the village profile study was SAR 8,111. However, the average annual revenue of households headed by women without a primary source of revenue, including government aid, was a mere SAR 3,770.

2.3.3 Marble Hall municipality

Marble Hall is located in the southern part of Sekhukhune district. The population stands at 121,327, the annual rainfall is 516mm and the temperature during the summer ranges from 19 to 32 ^{o} C and from 4 to 24 ^{o} C in the winter. The Olifants river runs through the municipality, serving as the most important water source along with the Arabie Dam. Since it has a relatively plentiful source of water, the municipality has many large-scale commercial farms. Small-scale agriculture by the African population is divided between a region with flourishing vegetable production in areas with water from the Olifants river and a region in which maize and sorghum are produced relying on rainwater. Cattle breeding is also typical. One of the characteristics of this region is that residences tend to be relatively widely dispersed in rural areas.

Of the 30 households studied, 12 were headed by women who in many cases were widows. The average family consists of 6.8 people. About 12% of the population had left the village for work, school or other reasons.

The average monthly cash income of the 30 households was SAR 1,688, which comes out to SAR 20,256 for the year. Of the 116 people covered in the study (excluding those of school age), 44 received aid from the government. Although there are opportunities for employment within the municipality at the commercial farms and other places, only 17 people made money in agricultural labor and other work or self-owned businesses.

Of the 30 households, 7 households spend SAR 200-400 and 6 households spend SAR 400-1000. Seventeen households stated that they only have 2 meals a day. Ten households eat meat once a week and 9 eat it about once a month. Five households borrow money from relatives, and 19 buy on credit from nearby retail stores. Many households go to nearby Marble Hall town for their shopping when pensions are paid, with 5 households going every week.

This area is unique in that its residences and household goods are more substantial than in the others. The homes are all made of brick and most have plastered walls. This is largely thanks to money sent by family members that have gone Johannesburg and Pretoria to work and the close proximity of these cities. However, there have been a growing number of cases recently in which these migrant workers have lost their jobs, so this is essentially a past inheritance.

Mixed maize crops growth with rainwater is the most common crop in the municipality. There is also small-scale cultivation of vegetable crops. Very few households rely solely on sorghum. All of the households covered in the survey are managed on an individual basis. Twenty-one of the households have a “Permission to Occupy (PTO),” but only 10 actually plant anything because of the dry weather over the past few years. The average area of farmland is 0.7ha. Three households have 0.5-1ha, and only 5 households had over 1ha. This municipality has two significant sources of water in the Olifants River and the Arabie Dam, but many of the small-scale farmers are unable to use this water. There are irrigation schemes in 6 locations, but of these 3 are not used. Only 3 households grew crops using irrigated water.

Land productivity seems to be relatively high, and with rainfall maize harvests are expected to be 10 backs (800kg). However, last year only 6 households brought in a crop, and the harvest was only one or two backs.

In regions that are drier and more dependent on livestock, most households raise goats, with an average of 20 goats per household. The average number of heads per household for farmers raising cattle is relatively high, at 30 heads. In addition, there are 2-15 sheep per household. All households raise chickens for their own use. Grazing land is plentiful, but production of range land is almost nonexistent due to the dry weather in recent years.

2.3.4 Blouberg municipality

Blouberg is in the northern portion of the Capricorn district, close to the border with Botswana. The population totals 161,322 people and annual rainfall is a mere 379mm, so cattle breeding and drought-resistant crops such as sorghum dominate agriculture here.

Of the 30 households in the survey area, women are the heads of the household in 13 cases, almost all of whom are widows. There are few households headed by single mothers. The cash income of the households covered in the study averaged SAR 1,694 a month or SAR 20,328 a year. Three households had monthly revenue of less than SAR 400. Of the 85 residents of these households (excluding school-age children), 32 receive aid such as old-age pensions. Seventeen people are self-employed or have a job. This region has many homes built through the Reconstruction and Development Program (RDP), and 12 households targeted in this study alone lived in homes built under RDP.

Fifteen households responded that their spending amounts to less than SAR 350 a month. Spending is SAR 400-650 for 14 households, and only one household spends more than that.

Twenty-three households eat only two meals a day, and almost all households stated that they eat meet about once a month. Eighteen households buy on credit at neighboring retail stores, and 8 households borrow money from relatives. Twenty-two households stated that they go to town to shop once a month, and generally shop on the day that their pensions are paid.

Almost all of the crops are sorghum, millet and beats grown under the rain-fed condition. Of the households targeted in this survey, 27 have the PTO, and the average area of farmland is an impressive 1.4ha, larger than the other areas. Twenty-two households have farmland with an area of more than 1ha. Nineteen households do not grow crops because of dry weather in the previous year (2004). The last good harvest that they can remember was in 1998, and since then rainfall has been sparse, hurting crop yields. There was one case in one of the villages in which a farmer group succeeded in raising vegetables. They used ground water and had monthly sales of SAR 600. Specifically, they only shared their water resources, and divided the land among the members and were responsible for buying their own input goods and selling their produce. Backyard vegetable gardens are relatively common in this area.

All of the targeted villages raise livestock. Many livestock have died in the recent drought. Grazing land is adequate in terms of area, but grass has been severely depleted. Animals are also typically used as traction power in this area. In the past, grazing land was rotated. Also, there are dips to ward off ticks, but this has not been done since the LDA stopped distributing the medication free of charge. There are some cases in which livestock farmers pool their money together to buy the necessary medication and fencing materials.

The Amamos Livestock Project started in the first half of the 1970s. Initially, 49 farmers raised 10 heads of cattle each on 4,000ha of grazing land and the LDA supplied prime bulls for breeding, but the number of farmers participating in the project declined as the cattle died in the subsequent droughts. The project is barely used now. The chief took the initiative in trying to resume this project in 2004. Each of the members put in SAR 1,500 to buy goats.

2.3.5 Thulamela municipality

Thulamela is located in the eastern part of Vhembe district, and the eastern side borders the Kruger National Park. The population totals 580,829 (32,738 in cities and 548,091 in rural areas), with a population density of 181 per square kilometer, higher than the province and country's average (2001 census). The annual rainfall is 697mm. Rainfall is less in the western part of the municipality, and qualifies as a semi-arid region. As a result, livestock is more common in the municipality's eastern part. Crops are a mix of beans, primarily sorghum and

millet. On the other hand, rainfall is relatively plentiful from the central to the eastern part of the municipality, and cultivation of fruit such as mangos, oranges, bananas and avocado is very common. The main grain is maize.

Of the 30 households in the survey, the average family size is 6.5 people. Of the 30 households, married men are the heads of the household in 13 cases, single men in 7 households, widows in 8 households and divorced women in 2 households. There were no households headed by single women. Of the 104 residents of these households (excluding school-age children), 33 receive pensions and aid and 22 people are self-employed or have a job. The cash income of the households covered in the study averaged SAR 1,983 a month or SAR 23,769 a year. More than half, or 17, households had monthly revenue of less than SAR 1,600. In the 4 high-income households, two or more members of the family received old-age pensions, which help to raise income. By region, the eastern region had the highest revenue and the western region tended to have the lowest. Eighteen households stated that they had almost no revenue from agriculture in 2004, a drought year.

Twenty households responded that their spending (limited to daily necessities such as food) amounts to less than SAR 400 a month. These households only eat meat on the days that pensions are paid. On the other hand, 9 households had some kind of savings, including deposits with financial institutions. Fourteen households had some kind of debt, but for 9 of these households the debt was a loan used to buy expensive household goods such as furniture and refrigerators.

At first glance these figures would not seem to add up. Even though more than 70% of the households have more than SAR 800 in monthly revenue, 70% spend less than SAR 400 a month. About 30% of the families took out loans to buy expensive household goods, and 30% of families have savings. There are two possibilities. One is that while data on spending reflects the drought situations, data on revenue has not been affected by the dry weather. Another possibility is that low-income families have family members that send them money. It is possible that they use their aid and agricultural revenue for their daily needs and use remittances and other third sources of revenue to buy luxuries.

Twenty-eight households have a PTO. Of these, 19 rely solely on rainwater. There is an irrigation scheme in the municipality, where production actually takes place. Fruit and vegetable are cultivated on a small scale in residential plots throughout the area. There were almost no grain harvests in either the eastern or the western parts of the municipality due to the drought in

2004 and 2005. Fourteen households have about 0.5ha of farmland, 11 have 1-2ha and three have more than 2ha. There are very few farmers with more than 10ha of land. Six households farm as a group.

In the eastern part of the municipality, the main grain crop is maize (mixed with beans), grown by rain-fed, but since the rainfall is relatively heavy, vegetable and fruit production is also common. There are some farmers with their own water source that have large fruit orchards. On the other hand, there are also cases of farmers with large plots of farmland that they cannot fully use, so they rent it out to other farmers. Almost all of the grain and fruit produced here is sold within the municipality. Some farmers with large fruit orchards sell through a commercial route. Livestock is fairly rare.

Since rainfall is low in the eastern part of the municipality, sorghum and millet are the main crops (mixed with beans). Livestock is more important in this area. The number of cattle range from a few heads to 100, and of the households targeted in this study 10 had more than 100 heads of cattle. The majority of livestock are cattle, with fewer goats (about 5-8 per household). Almost all households raise chicken for their own use (meat). In years when there is enough feed, households trade in their cattle for cash twice a year. They sell their animals in the area as well as, at an auction. However, almost no cattle were sold in 2004 and 2005 because of the drought.

2.3.6 Maruleng

Maruleng is located in the western part of the ex-Bohlabela district. With a population of 94,382, the population density is 27, lower than the national average (2001 census). The annual rainfall is 513mm. The temperature is 20-32^{o}C in the summer and 10-25^{o}C in the winter. In areas with significant rainfall the main crop is maize, and in dry areas sorghum and millet are the main crops. However, in parts of the southern and eastern parts, rain is fairly plentiful and vegetables and fruit can be grown, while in the central and northern parts where rain is scarce, stockbreeding and sorghum are more common.

The average family size of the targeted households of this survey is 5.3 people. Of the 30 targeted households, 17 were headed by women, of which 5 were unmarried mothers. Cash revenue averages SAR 1,360 a month, or SAR 16,320 a year. Of the 102 residents of these households (excluding school-age children), 20 receive aid from the government and 12 people are self-employed or receive income from jobs. Almost all farming is subsistence and does not represent an important revenue source. There are commercial farms and private game reserves

in the municipality, and while these are small, they do provide employment opportunities.

Eighteen households spent less than SAR 300 on daily necessities such as food, and 11 households spent SAR 300-800. Twenty-three households eat only twice a day, and 7 households eat meat once a week and 12 eat it once a month. Twenty-five households have debt credit of about SA R100-800 at nearby retail stores.

Twenty-three households have a PTO, and 20 actually use it to grow crops. The average land area is 0.6ha, with 13 households having less than 0.5ha, 10 households having 0.5-1ha and 2 households with more than 1ha. Many families grow a mixed crop of maize using rainwater, but sorghum and millet are the main crops in the drier areas in the central and northern part of the municipality. They tend to favor tractors, so animals are rarely used for farming. Cash crops include fruit such as mangos, avocados, lychee and bananas and vegetables such as tomatoes, cabbage, beet roots, sweet potato and onions. There is 5,000ha of commercial farmland in the municipality, in addition to 100ha of farmland bought by the government in the land reform scheme, but this has not yet been redistributed. There is one irrigation scheme in the municipality that appears to have been used previously, but is currently not in use because of inadequate water resources as a result of the low rainfall in the past few years.

Livestock is common even in the south and east, where rainfall is relatively heavy, with an average of 12 cattle per household. Livestock is more common in drier areas, and heads of cattle averaged 25 and 15 for goats in the targeted villages. Chickens are commonly seen regardless of areas or rain. In the dry areas where livestock flourishes, animals are typically auctioned off once or twice a year. In one village, a group of 7 farmers have a chicken farming project that is generating steady profits.

Reference:

Mid-year population estimates, 2006
http://www.statssa.gov.za

Table 2-1 Gross National Product: Republic of South Africa

Sector/ industry	1995	1996	1997	1998	1999	2000	2001	2002
	Year							
Total GDP	SAR million current prices							
GDP all industries at basic prices	500,352	565,473	627,167	673,860	728,785	808,461	895,533	1,021,685
Plus taxes on products	53,644	58,119	63,419	70,668	76,707	83,316	91,118	103,305
Less subsidies on products	5,898	5,634	4,857	5,600	4,720	3,322	3,204	4,095
GDP at market prices	**548,099**	**617,958**	**685,729**	**738,927**	**800,771**	**888,455**	**983,448**	**1,120,896**
Contributions to GDP	Per cent of total GDP at basic prices							
Agriculture forestry and fishing								
- Agriculture	3.2	3.5	3.4	3.0	2.8	2.6	2.8	3.5
- Forestry	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5
- Fishing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total agriculture forestry and fishing	3.9	4.2	4.0	3.6	3.4	3.2	3.5	4.1
Mining and quarrying	7.0	6.9	6.5	6.4	6.3	6.8	7.5	7.7
Total primary industry	**10.8**	**11.1**	**10.5**	**10.1**	**9.8**	**10.0**	**11.0**	**11.9**
Manufacturing	21.2	20.2	19.9	19.1	18.7	18.5	18.6	19.4
Electricity and water	3.5	3.3	3.2	3.3	3.0	2.8	2.6	2.4
Construction	3.2	3.1	3.2	3.2	3.1	2.9	2.8	2.6
Total secondary industry	**27.9**	**26.6**	**26.2**	**25.7**	**24.7**	**24.3**	**24.0**	**24.4**
Wholesale and retail trade, restaurants and hotels	14.3	14.7	13.7	13.3	13.1	13.3	13.3	13.1
Transport and communications	8.9	9.2	9.2	9.4	9.7	10.0	10.0	9.8
Finance, real estate and business services	16.4	16.6	17.6	18.4	19.7	19.9	19.7	19.7
Community, social and other personal services	2.7	2.7	2.8	2.9	3.0	3.0	3.1	3.0
General government services	16.2	17.0	17.2	17.3	16.9	16.4	15.9	15.1
Other	2.8	2.8	2.8	3.0	3.1	3.1	3.1	2.9
Total tertiary industry	**61.3**	**62.3**	**63.3**	**64.2**	**65.5**	**65.7**	**65.0**	**63.7**
All industries at basic prices	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Statistics South Africa, 2003

Table 2-2 Gross National Product and Sector Growth Rates: Republic of South Africa

Sector/ industry	Year							
	1995	1996	1997	1998	1999	2000	2001	2002
	SAR million constant 1995 prices							
GDP at market prices	500,352	521,611	535,321	539,595	551,624	571,549	587,215	608,627
Change in contributions to GDP	Per cent change							
Agriculture forestry and fishing								
- Agriculture	-23.5	29.0	1.7	-7.4	5.8	8.7	-4.0	7.5
- Forestry	2.4	1.3	-2.8	-3.6	0.7	0.7	0.5	0.3
- Fishing	-3.0	-2.6	-10.9	3.5	1.7	2.3	2.7	0.9
Total agriculture forestry and fishing	-19.9	24.0	0.9	-6.8	5.1	7.6	-3.3	6.5
Mining and quarrying	-3.1	-0.8	1.7	-0.8	-1.1	-2.3	-1.3	0.3
All primary industry	-9.9	8.0	1.3	-3.2	1.3	1.7	-2.2	3.0
Manufacturing	6.5	1.4	2.7	-1.9	-0.3	5.1	3.5	5.3
Electricity and water	2.0	10.8	3.9	1.6	1.8	0.7	1.3	1.8
Construction	3.6	2.0	3.4	2.6	-2.4	2.7	3.3	4.3
All secondary industry	5.6	2.6	2.9	-0.9	-0.3	4.2	3.2	4.7
Wholesale and retail trade, restaurants and hotels	5.9	3.7	0.4	-1.1	0.3	4.5	3.4	2.8
Transport and communications	10.6	6.1	7.6	6.7	7.1	7.0	7.7	6.7
Finance, real estate and business services	3.5	6.8	4.7	5.3	7.7	4.8	4.2	3.8
Community, social and other personal services	10.2	3.8	-1.7	1.0	2.3	4.7	3.8	3.7
General government services	0.8	1.9	0.8	-0.4	-0.7	-0.7	-0.9	0.5
Other	1.2	1.5	1.6	2.3	2.0	1.9	1.6	1.4
All tertiary industry	4.5	4.3	2.7	2.3	3.5	3.7	3.4	3.3
All industries at basic prices	3.0	4.2	2.6	0.8	2.2	3.6	2.7	3.6
Taxes on products	4.8	4.9	2.9	0.5	0.1	2.3	2.0	2.8
Less subsidies on products	8.3	4.5	3.8	1.8	1.1	1.5	1.3	4.0
GDP at market prices	3.1	4.3	2.6	0.8	2.0	3.5	2.7	3.6

Source: Statistics South Africa, 2003

Table 2-3 Gross National Product: Republic of South Africa: by Province

Province	Year							
	1995	1996	1997	1998	1999	2000	2001	2002
	SAR million current prices							
Western Cape	80,036	88,362	98,669	105,484	116,315	128,436	140,054	159,623
Eastern Cape	45,332	51,066	56,501	60,562	66,066	72,646	80,051	88,032
Northern Cape	12,532	12,996	14,257	15,143	17,042	17,918	19,718	22,546
Free State	31,136	37,101	40,248	41,027	44,903	49,064	53,566	64,310
KwaZulu-Natal	91,992	104,081	114,645	123,011	131,336	145,260	162,597	183,095
North West	33,499	39,731	42,804	46,463	50,190	58,120	65,532	73,520
Gauteng	185,546	207,448	231,221	250,463	269,250	301,717	328,281	379,373
Mpumalanga	36,961	42,830	47,292	51,017	54,725	59,843	68,322	77,835
Limpopo	31,065	34,343	40,091	45,757	50,944	55,451	65,325	72,562
GDP at market prices	**548,099**	**617,958**	**685,728**	**738,927**	**800,771**	**888,455**	**983,446**	**1,120,896**
	Per cent of total							
Western Cape	14.6	14.3	14.4	14.3	14.5	14.5	14.2	14.2
Eastern Cape	8.3	8.3	8.2	8.2	8.3	8.2	8.1	7.9
Northern Cape	2.3	2.1	2.1	2.0	2.1	2.0	2.0	2.0
Free State	5.7	6.0	5.9	5.6	5.6	5.5	5.4	5.7
KwaZulu-Natal	16.8	16.8	16.7	16.6	16.4	16.3	16.5	16.3
North West	6.1	6.4	6.2	6.3	6.3	6.5	6.7	6.6
Gauteng	33.9	33.6	33.7	33.9	33.6	34.0	33.4	33.8
Mpumalanga	6.7	6.9	6.9	6.9	6.8	6.7	6.9	6.9
Limpopo	5.7	5.6	5.8	6.2	6.4	6.2	6.6	6.5
GDP at market prices	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Statistics South Africa, 2003

Table 2-4 Gross Province Product and Sector Growth Rates: Limpopo Province

Industry	Year							
	1995	1996	1997	1998	1999	2000	2001	2002
	SAR million current prices							
GDP all industries at basic prices	28,213	31,314	36,579	41,591	46,255	50,398	59,433	66,086
Taxes less subsidies on products	2,852	3,029	3,511	4,166	4,689	5,053	5,892	6,476
GDP at market prices	**31,065**	**34,343**	**40,091**	**45,757**	**50,944**	**55,451**	**65,325**	**72,562**
Contributions to GDP	Per cent of total GDP at basic prices							
Agriculture forestry and fishing	3.6	2.9	2.3	3.1	2.8	2.1	2.5	2.5
Mining and quarrying	16.5	14.2	13.8	14.5	16.7	18.1	21.4	21.8
Total primary industry	**20.1**	**17.0**	**16.1**	**17.7**	**19.5**	**20.3**	**23.9**	**24.2**
Manufacturing	4.9	4.8	4.5	4.0	3.9	3.9	3.7	3.8
Electricity and water	3.6	3.7	3.5	3.5	3.0	3.0	2.5	2.5
Construction	2.8	2.9	2.7	2.6	2.3	2.4	2.1	2.1
Total secondary industry	**11.3**	**11.4**	**10.7**	**10.1**	**9.2**	**9.3**	**8.3**	**8.4**
Wholesale and retail trade, restaurants and hotels	14.2	14.2	13.4	12.5	12.0	12.5	12.2	11.8
Transport and communications	6.4	7.0	7.0	7.0	7.4	7.5	8.2	8.6
Finance, real estate and business services	16.5	17.4	17.3	17.1	16.8	16.0	15.3	15.1
Community, social and other personal services	4.9	5.0	4.9	4.8	4.8	5.0	4.7	4.6
General government services	17.3	19.1	21.8	21.6	21.0	20.4	18.4	18.2
Total tertiary industry	**59.4**	**62.7**	**64.4**	**63.1**	**62.1**	**61.3**	**58.8**	**58.4**
All industries at basic prices	**90.8**	**91.2**	**91.2**	**90.9**	**90.8**	**90.9**	**91.0**	**91.1**
Taxes less subsidies on products	9.2	8.8	8.8	9.1	9.2	9.1	9.0	8.9
GDP at market prices	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Statistics South Africa, 2003

Table 2-5 Gross Province Product and Sector Growth Rates: Limpopo Province

Industry	1996	1997	1998	1999	2000	2001	2002
	SAR million, constant 1995						
GDP at market prices	32,106	34,349	36,565	37,411	37,405	39,689	40,847
Change in contributions to GDP	Per cent change						
Agriculture forestry and fishing	1.8	-1.1	23.5	5.8	8.7	-4.0	7.5
Mining and quarrying	-3.4	4.5	13.6	3.3	-3.6	9.3	3.1
All primary industry	**-2.4**	**3.4**	**15.3**	**3.9**	**-3.0**	**8.6**	**5.0**
Manufacturing	1.5	2.7	-2.9	0.8	3.7	5.3	2.6
Electricity and water	14.0	5.2	8.6	-1.9	2.3	-0.1	4.1
Construction	7.1	0.2	3.1	-7.0	9.4	-1.7	9.8
All secondary industry	**6.9**	**3.0**	**2.6**	**-2.1**	**4.5**	**1.7**	**4.8**
Wholesale and retail trade, restaurants and hotels	3.9	2.3	0.8	0.6	5.1	8.0	1.5
Transport and communications	10.7	12.1	13.2	12.8	4.1	23.9	13.8
Finance, real estate and business services	4.7	3.2	3.6	1.1	-3.9	4.7	-2.1
Community, social and other personal services	2.9	0.2	1.9	2.4	3.4	2.6	2.7
General government services	3.2	20.9	5.5	2.1	-1.5	-0.9	-0.9
All tertiary industry	**4.6**	**8.8**	**4.6**	**2.9**	**0.4**	**6.3**	**2.1**
All industries at basic prices	**3.3**	**7.0**	**6.5**	**2.5**	**0.1**	**6.2**	**3.0**
Taxes less subsidies on products	3.6	7.3	6.0	0.1	-1.2	4.8	1.8
GDP at market prices	**3.3**	**7.0**	**6.5**	**2.3**	**0.0**	**6.1**	**2.9**

Source: Statistics South Africa, 2003

Table 2-6 Household Income Estimates: Republic of South Africa: by Province

Province	Mean household income (census)	Mean household expenditure (IES)	Proportion of households with income < SAR 800 per month (census)	Proportion of households with income < SAR 800 per month (IES)	Proportion of individuals within households with income < SAR 250 per month (census)	Proportion of individuals within households with income < SAR 250 per month (IES)
	SAR per month	SAR per month	Per cent	Per cent	Per cent	Per cent
Western Cape	3,976	3,919	26.7	12.5	30.1	25.3
Eastern Cape	1,479	1,815	68.3	44.5	76.4	67.9
Northern Cape	2,244	2,217	50.3	38.0	59.1	52.6
Free State	1,823	1,794	58.8	51.0	66.3	62.2
KwaZulu-Natal	2,193	2,680	55.4	24.3	66.1	52.2
North West	1,737	2,218	56.1	37.2	65.4	58.9
Gauteng	4,044	5,086	33.9	10.6	34.3	14.4
Mpumalanga	1,762	2,356	60.2	25.6	68.4	54.0
Limpopo	1,234	2,188	71.8	36.4	79.9	58.0

Source: Statistics South Africa, 2003

Table 2-7 Selected Work Force Indicators: Republic of South Africa

Indicator	National	All nodal areas	Sekhukhune District
	Per cent		
Males economically active	65.1	47.4	37.8
Male unemployment rate	24.8	35.1	54.4
Females economically active	54.0	37.1	26.8
Female unemployment rate	28.0	32.7	39.1
All people economically active	59.3	41.4	30.8
All people unemployment rate	26.4	33.9	45.9

Source: Measuring Rural Development, 2003

Table 2-8 Main Income Sources: Selected Areas

Source	All nodal areas	Sekhukhune District
	Per cent	
Salaries and/ or wages	32.6	21.6
Remittances	23.5	29.1
Pensions and grants	32.2	37.8
Sale of farm produce	1.5	1.2
Other non-farm	7.2	6.9
No income	1.9	3.3
Unspecified	1.1	0.2
Total	100.0	100.0

Source: Measuring Rural Development, 2003

Table 2-9 Welfare Grants

Source	All nodal areas	Sekhukhune District
	Per cent of all households	
Proportion receiving any welfare grant	38.9	61.1
Proportion not receiving any welfare grant	41.0	59.0
Type of payment received	Per cent of all households receiving grants	
Old age pension	79.1	90.1
Disability grant	11.8	3.6
Child support grant	16.4	11.8
Care dependency grant	0.7	-
Foster care grant	0.5	-
Grant in aid	0.6	-
Social relief	0.6	-

Source: Measuring Rural Development

Table 2-10 Employment in the Target Area

	Fetakgomo Municipality	Makhuduthamaga Municipality	Two municipalities
Employment	Persons		
Employed	3,747	12,788	16,535
Unemployed	10,197	30,183	40,380
Class of occupation			
Senior management	102	426	528
Professional	1,049	3,543	4,592
Technical	125	678	803
Clerk	108	596	704
Service related	279	1,135	1,414
Skilled	61	418	479
Craft/ trade	869	1,758	2,627
Plant machine	455	1,118	1,573
Elementary	515	2,496	3,011
Not classified	480	1,580	2,060
Sector of occupation			
Farming	87	423	510
Mining	1,013	819	1,832
Manufacturing	126	593	719
Utilities	71	224	295
Construction	230	1,008	1,238
Trade	258	1,516	1,774
Transport	137	879	1,016
Business services	119	495	614
Social services	1,215	4,749	5,964
Private household	309	1,476	1,785
Extraterritorial	4	6	10
Diplomatic	3	6	9

Source: Integrated Development Plans

Part 2 FINDINGS OF THE STUDY

Chapter3 Natural Conditions, Soil and Agriculture

3.1 Natural Conditions

3.1.1 Topography

The target area is located on the right bank of the Olifants midstream and 80km south-south east of Polokwane, the capital of Limpopo Province. The area is composed of the catchments of the Olifants and Lepellane rivers and other small streams and is located in the gently undulating part of the Olifants river basin. Topographically, the area can be divided into the three zones -- Lepellane river plain, sloping ground and Olifants backland. Their features and geographical distribution are indicated in Table 3-1 and Figure 3-1 below.

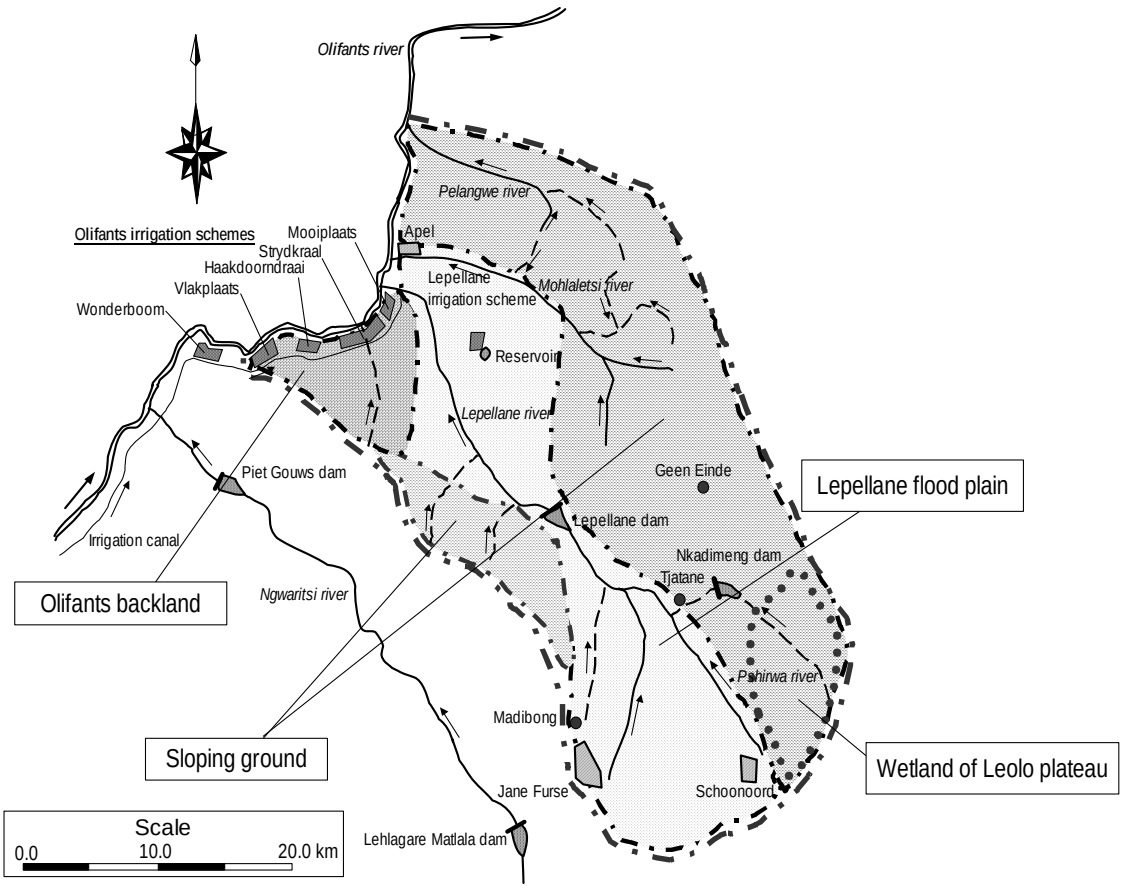


Figure 3-1 Topographical Zones in the Target Area

Table 3-1 Features of Three Zones

Zone	Description
Lepellane river plain	River plain of Lepellane river, sloping generally 2-5%.
Sloping ground	Composed of mountains and narrow valleys. In the southeast part of this zone lies a wetland of Leolo plateau on the upstream of Pshirwa river.
Olifants backland	Part of Olifants river plain where several Olifants irrigation schemes have been developed and backland of the Olifants scheme area.

3.1.2 Climate

The climate of the target area is characterized by unpredictable rainy seasons followed by dry winter seasons. Annual rainfall varies from 400-600 mm and falls mainly between October and March. During six months of the rainy season, there are around 56 days with rainfall of 0.2 mm or more, and 18.6 days with 10.0 mm or more. Annual evaporation is 1,600-1,900mm. Figure 3-2 shows the average rainfall based on data of the last 70 years for Sekhukhune district. Table 3-2 shows climatic details at six places in and out of the target area.

The annual average daily maximum/minimum temperatures are 27.5c and 7.0c respectively, and the average daily maximum for the hottest months (October to February) is in the order of 35c. Yet, daily temperatures often rise as high as 38 to 39c. The coolest season is from May to August, with the lowest temperature below 10c.

Figure 3-2 Temperature and Rainfall at Sekhukhune Land

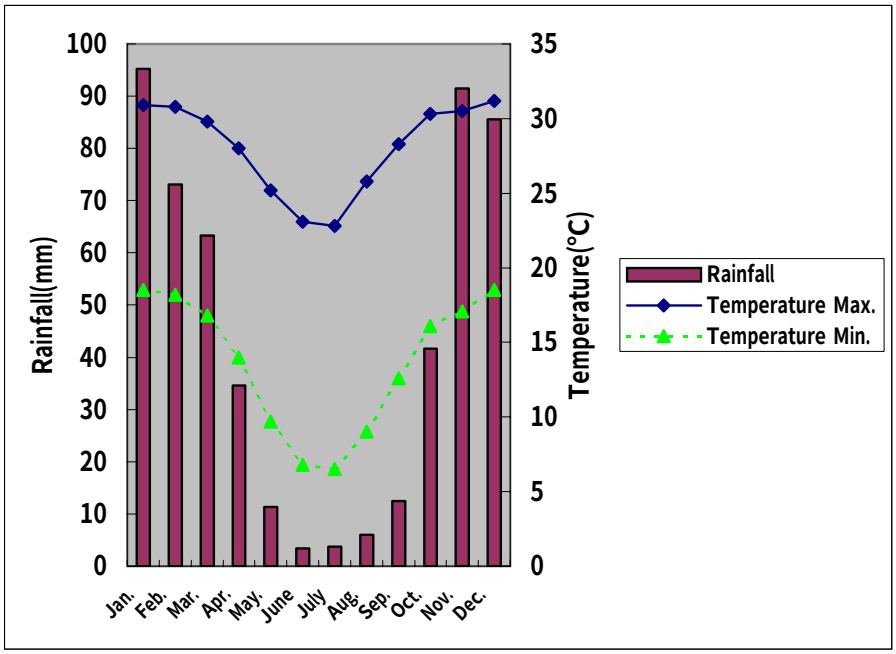


Table 3-2 Climatic Details at Six Places

Station	Mean annual precipitation (mm)	Average daily maximum temperature (C)	Average daily minimum temperature (C)	Mean annual evaporation (mm)	Remarks
Sekhukhuneland (or Schoonoord)	557.4	27.5	7.0	-	Inside the target area
Jane Furse	558.6	-	-	-	Inside the target area
Wonderboom	411.5	-	-	-	Inside the target area
Marble Hall	491.3	32.5	4.4	-	Inside Olifants basin
Polokwane	491.0	29.1	4.2	2,351	Outside Olifants basin

Relative humidity varies between 60% and 70% at 8 a.m. Light frost may occur in during June and July in cold winters. Sunshine averages 8-9 hours per day throughout the year. The estimated average evaporation for the area is ±6.8mm per day with the highest rate exceeding 8.4mm per day between September and December. Table 3-3 sets out the evaporation figures for Zebediala area.

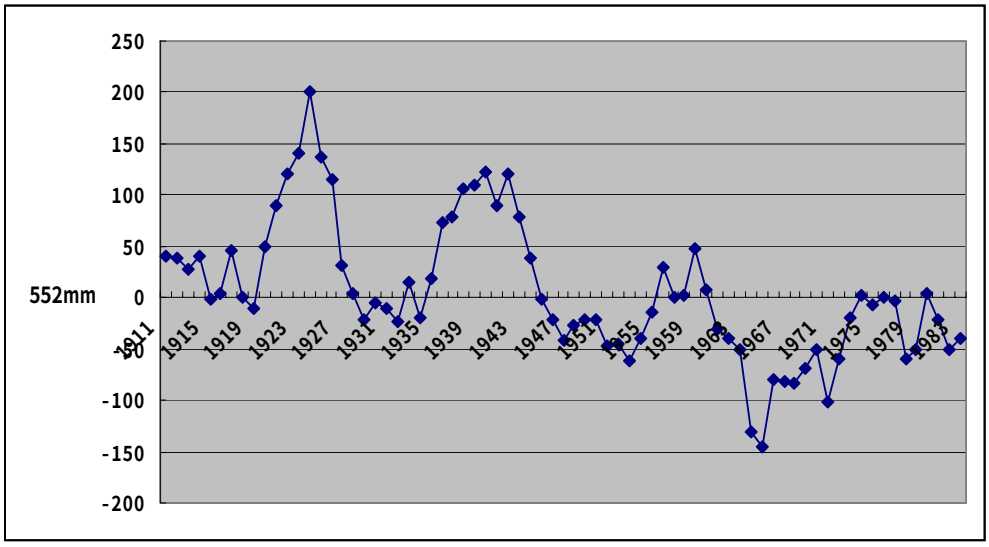
Table 3-3 Average Evaporation Figures for Zebediala

	mm/month	mm/day
January	236	7.6
February	205	7.3
March	228	7.4
April	165	5.5
May	149	4.8
June	121	4.0
July	137	4.4
August	183	5.9
September	253	8.4
October	291	9.4
November	254	8.5
December	263	8.5
Total & Average	2,485	6.8

Since 2003, severe drought conditions continued. In an ordinary year, it rains from November to March, but little rain had been observed till the beginning of February 2003. Sorghums have not been planted in most of the target area except the southern part of the area.

The annual precipitation of the area is very variable. From the recent records, drought has occurred in 1982, 1986, 1991, 2002 and 2003 by remarkable frequency. The long-term rainfall record from 1911 to 1982 indicates declining tendency of rainfall in recent years in the target area. It is feared that droughts will recur even more frequently in the future. (See Figure 3-3)

Figure 3-3 Long-term Rainfall Record from 1911 to 1982



Source: South African Weather Service, National Department of Water Affairs and Forestry (DWAF).

Notes: 1. Data from the many years in which the observed data was not uniform are excluded here.

2. The rainy season lasts from around October or November until about March or April. Accordingly, the total rainfall from May through April of the following year (total rain during the dry period and the rainy period) is used to indicate the annual rainfall. Fluctuations in this annual rainfall are shown in the graph above.

3. Although there is a great deal of missing data, the linear regression line demonstrates that rainfall is on a prolonged decline.

3.1.3 Vegetation

The natural veldt types of the area are generally described as mixed bush veldt and sourish mixed bush veldt. The dominant trees and shrubs include *Acacia rehmanniana, A.karoo, A.Robusta,* and *A. Tortilis*. The dominant grasses are *Eragrostis sp, Aristida sp, Digitaria sp* and *Trichoneura sp.* A variety of aloes are present throughout the area in shallow or rocky soils.

The Olifants midstream basin is covered by the savannah biome. The vegetation in the target area generally consists of shrubs and short grasses, while some natural forests are also seen in the wetland of Leolo plateau. Vegetation has been degraded throughout the target area, mainly by human activities such as overgrazing and cutting trees for firewood and fencing materials. (See Photo 3-1)

Photo 3-1 Typical Scenery of the Target Area

3.1.4 Soils and Soil Erosion

The dominant soils belong to the Hutton Form (by the South African Soil Classification System) which consists of well-drained, eutrophic loams and coarse sands derived predominantly from granite of the Lebowa Granite Suite. The terraces of the Olifants and Lepellane rivers are occupied by well-drained loam of the Oakleaf Form, which is characterized by a duplex morphology, i.e., topsoil that differs from sub-soil in respect of texture, structure and consistency. The land along the banks of the Olifants and Lepellane rivers is comprised of alluvium, suitable soil in places up to 1,000m wide.

Various depth phases are overlain by weathering rock throughout the area. Erosion phases are especially noticeable on the foot slopes of the southerly area, sloping northwards to the Olifants river. Runoff is apparently more vigorous in this area of long foot slopes and adjoining steeper hilly land, probably caused by poor veldt conditions and injudicious plowing.

No seriously harmful salts are present in the soils which are low in phosphate and have pH values mainly in the favorable range of 5.5-7.5. The groundwater around Apel has high salinity.

Two types of soil erosion (“Donga” or gully erosion) are widely observed in the target area; they are ordinal dongas and shallow dongas. The ordinal donga is a type of soil erosion expanding linearly as it moves downstream, with an increasingly deeper and wider size along downstream. Shallow donga is another type of erosion that washes away topsoil. The width of erosion and the amount of soil washed away increase as it moves downstream. Many shallow dongas are spotted here and there in Olifants backland and left-bank side of Lepellane downstream area. Figure 3-4 shows the distribution of the soil erosion in the target region.

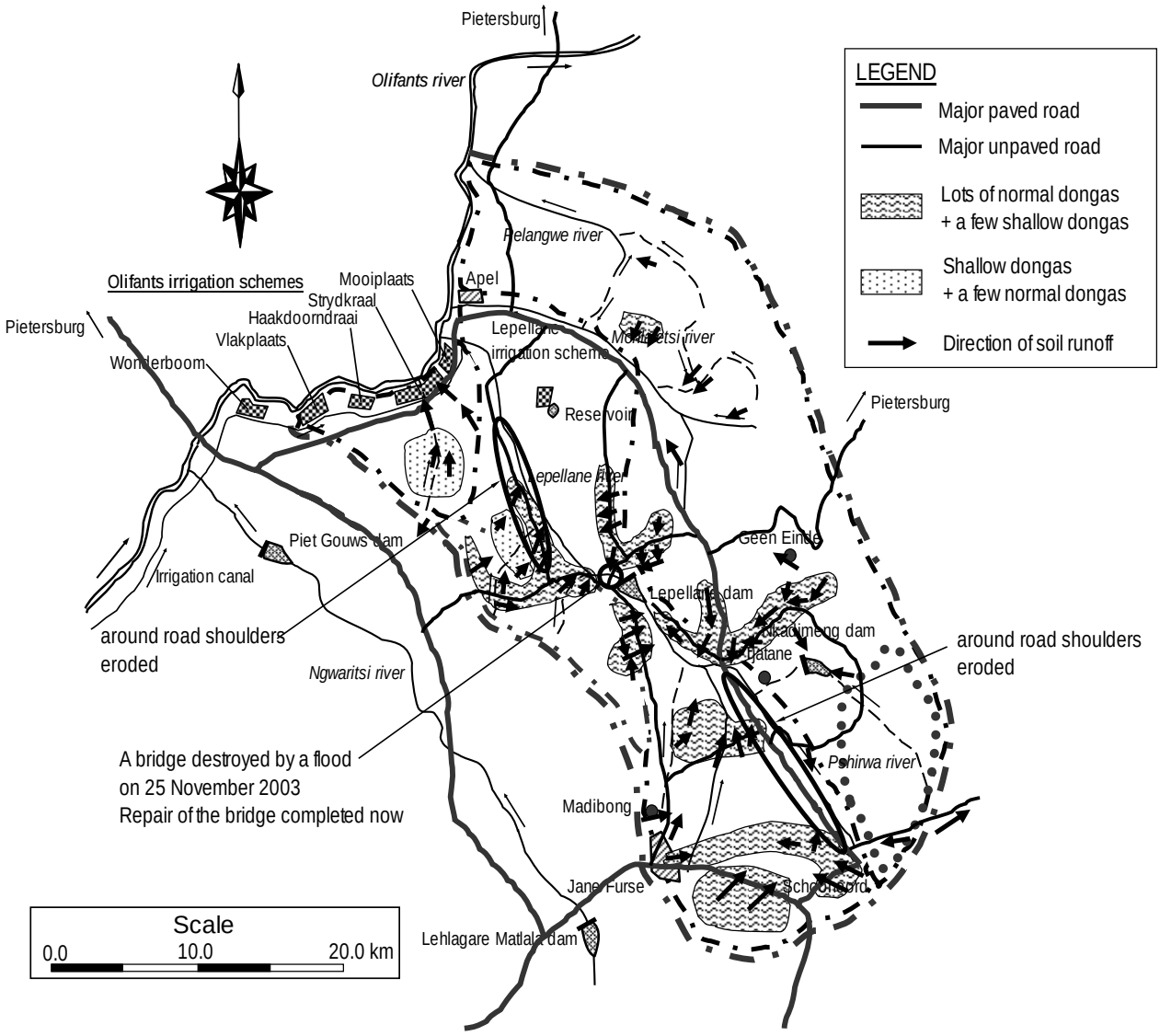


Figure 3-4 Distribution of soil erosion in target region

A range of actions and projects has been taken against the widespread soil erosion in the target area and the surrounding area. Table 3-4 provides examples of the soil conservation projects undertaken in the target area, while Figure 3-5 shows the location of these projects. Although some participatory activities have been initiated in several communities such as Geen Einde, Koringkoppies and Sekgopo, this participation consisted primarily of providing labor, and conscious efforts to raise people's awareness regarding the issue of community participation in planning and the community's efforts to develop a maintenance system are not sufficient at this point. Of the examples shown in Table 3-4, Table 3-5 shows the current status of the five projects in Geen Einde, Koringkoppies, Sekgopo, Makgoba and Boekenhoutlaagte, excluding provisional measures and those that have not yet been implemented.

Landcare is a program focused on soil conservation carried out throughout South Africa, and has the distinct features listed below. Of the examples given in Table 3-4, Landcare funding was used in Geen Einde and Koringkoppies.

1) The program is carried out by the respective province's department of agriculture at the residents' request; programs have been implemented in about 200 regions throughout the country.
2) Methods used in soil conservation are chosen to fit the region's characteristics. A combination of methods are used, including civil engineering methods such as contour banks, aqueducts and wire basket retaining walls, building fences and structures using tires, planting trees and grasses and water harvesting.
3) One of the focuses is the promotion of residents' participation, but this participation primarily consists of providing labor for the building construction, and it is rare for the residents to take a leading role from the planning stage.

Table 3-4 Examples of soil conservation projects inside and outside PRIDE target region

Region	Year implemented	Purpose	Overview	Current problems and good output
Geen Einde	1992-2003	To conserve 300ha of grazing land	Background: LDA chose Geen Einde as a priority region due to its advanced gully erosion. The program was implemented with funding from Landcare and the LDA. Main structures and activities: Large-scale aqueducts, wire basket retaining walls, tire structures, fences, planting vetiver	Problems: (1) Scale of the structures is large, requiring considerable time and money and (2) there is room for improvement in terms of both design and maintenance. Good output: There was some vegetation recovery.
Madibong	—	To prevent large-scale donga from expanding	Background: LDA chose Madibong as a priority region due to its advanced gully erosion and a committee was formed to encourage residents to participate in the project, but the project never left the planning stage. Plans for main structures and activities: Wire basket retaining walls, planting various trees and grasses (including vetiver).	—
Tjatane - Schoonoord	—	To prevent erosion from spreading around roads and aqueducts	Background: LDA implemented the program in several areas as an emergency measure to prevent the spread of erosion. Main structures and activities: Small structures such as wire basket retaining walls and masonry retaining walls	Problem: There is room for improvement in maintenance. (Deterioration to the structure has not yet been repaired.)
Jane Furse - Schoonoord	—			
Mohlaletsi	—			
Koringkoppies	2001-2003	To protect 55ha of irrigated farmland and non-irrigated land	Background: Landcare's scheme and funding were used for the program. Main structures and activities: Aqueducts, contour banks, wire basket retaining walls, fences, irrigation ditches, dam rehabilitation	Good output: There was some vegetation recovery.

Region	Year implemented	Purpose	Overview	Current problems and good output
Sekgopo	2002-	To conserve 900ha of arable land	Background: LDA chose Sekgopo as a priority region because arable land is being expanded to the foot of the slope, where donga is advanced. LDA requested that the national Department of Agriculture conduct the survey and design and build the structures, and the national government's budget was used for the project. As of this point it has not yet been finished and is still underway. Main structures and activities: Aqueducts, wire basket retaining walls, contour banks, fences, planting vetiver	Problem: (1) Scale of the structures is large, requiring considerable time and money
Makgoba	1993	To conserve arable land	Background: LDA carried out the project at the request of the residents. Main structures and activities: Aqueducts, contour banks	Problem: There is room for improvement in maintenance.
Boekenhoutlaagte	1993	To conserve 91ha of arable land	Background: LDA carried out the project at the request of the residents. Main structures and activities: Aqueducts, contour banks	Problems: The structure has not been maintained, and the arable land that was intended for conservation has been abandoned and has become grazing land.

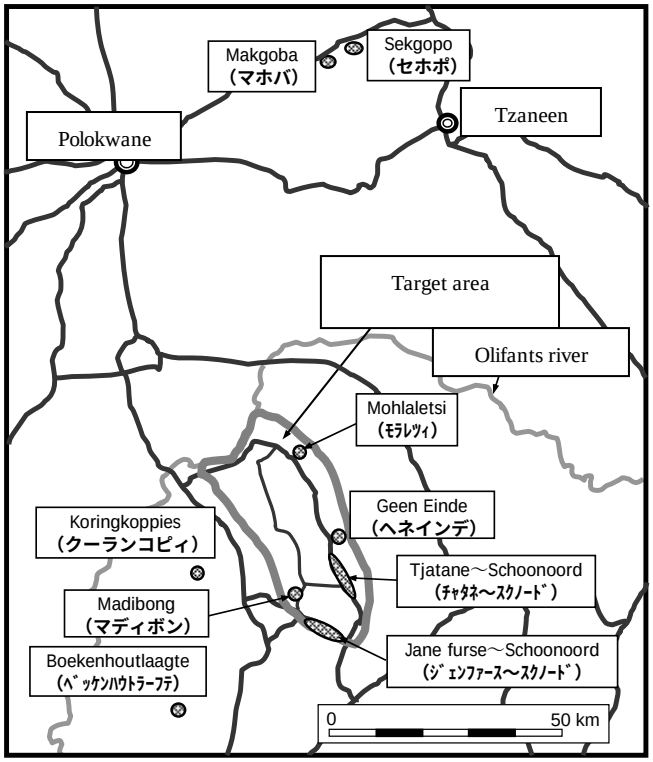


Figure 3-5 Location of soil conservation projects inside and outside the target region

Table 3-5 Current status of soil conservation projects inside and outside the target region (Geen Einde)

Site	**Geen Einde**	**(1/2)**
Portions of the fence and wire basket retaining wall have not been maintained or were not designed properly, but as of 2006 vegetation has definitely increased compared to when the project started and the 2002/2003 rainy season. Initially when the project started the residents were active participants, but they have not continued to do so. This should be improved with continued support from LDA and extension officers, stronger organizations among farmers and a sustained sense of ownership. ▼Old tires are piled up in a row, dirt is packed in and grass is planted. This is repeated for several rows. This method is effective in conserving the moist soil in upstream areas.   ▲The fence was built in this way, but ▼portions of it have collapsed, as shown here. 	In the portions that were not designed correctly, vetiver was planted in the upstream section of the wire basket retaining wall, which obstructs the flow of water, or the design of the wire basket retaining wall completely cuts off the flow of water. Since the flow of water is cut off, erosion on the side of the wire basket retaining wall actually spreads. These problems can be redressed by improving the design of the wire basket retaining walls and planting vetiver on the top of the wire basket retaining walls. ▼Since the flow is obstructed from the center of the wire basket retaining wall, the back of the retaining wall is being eroded.  ▼Same 	

Site	Geen Einde	(2/2)

▲Vetiver grows thickly in the upper reaches of the wire basket retaining wall, but
▼erosion is occurring here because the vetiver cuts off the flow of sediment and floods.

▼A large wire basket retaining wall made up of several tiers was built on top of a large-scale aqueduct. Building such a large structure requires money and time.

▼Nevertheless, these wire basket retaining walls and tire structures have been effective in restoring vegetation. The picture above is a panoramic view of the entire site as of June 2006. When the project started, there was almost no vegetation, making for a desolate view.

Table 3-5 Current status of soil conservation projects inside and outside the target region (Koringkoppies)

Region	Koringkoppies
Phase I of this project started in 2001, and an interim evaluation was conducted when the project transitioned to Phase II from July to August 2002. The following observations were made at that point: ① Although the wire basket retaining wall and other soil conservation structures were slightly damaged by flooding, they have stood up well overall. ② It was determined that the area directly downstream of the dam could be irrigated. However, there is little land area and the soil is not very fertile. ③ There is very little springwater and there is severe erosion around the aqueduct. It will be expensive to construct an irrigation channel from the point of the spring water to the dam. ④ The farmers requested that the newly built irrigation channels be extended further, but the downstream area is not suitable for cultivation.	⑤ Besides fences, when transitioning to Phase II feasibility should be reconsidered. Ultimately, (1) soil conservation structures using aqueducts and contour banks, (2) concrete aqueduct from dam to irrigated farmland and (3) a fence were built. ((1) and (2) were built during Phase I and (3) was built during Phases I and II.) Current conditions can be summed as follows: ① The concrete irrigation channel has already been completed and is being used to supply water to arable land, so the water is being used effectively. However, some filed do not have very fertile soil so the harvest is not satisfactory. ② The fence building was successful to some extent in that it protected vegetation.

Table 3-5 Current status of representative soil conservation projects inside and outside the target region (Sekgopo)

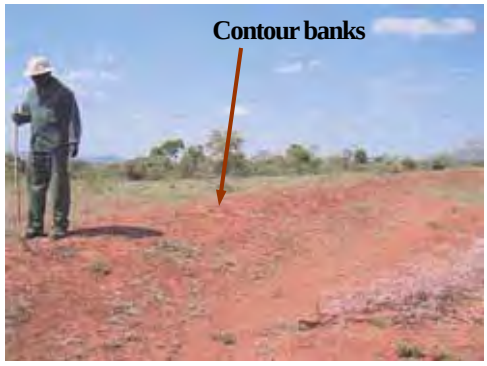
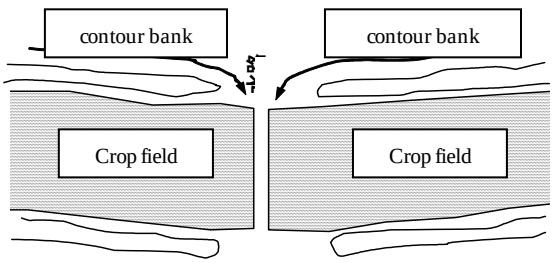
Site	**Sekgopo**
LDA submitted a request to the national Department of Agriculture and the work was carried out using the National Department's funding and staff. The construction work is not yet completed. Many of the structures are quite large, and there are uncertainties as to the extent to which the residents can manage maintenance of them on their own, but the success of this project will depend on the residents' activities and administrative support. ▼Several large wire basket retaining walls has been built, which will cause project costs to escalate. The central portion is being built as an open structure so that it does not obstruct the flow of the water, and in this respect differs from Geen Einde.  ▼Same 	▼Condition of contour banks  ▼Condition of aqueducts; land is beginning to be cultivated in some areas on the right-hand side of the surface. 

Table 5-5 Current status of representative soil conservation projects inside and outside the target region (Makgoba)

Region	**Makgoba**	**(1/2)**
As shown in the figure to the right, several rows of contours are formed and a simple method is used to steer the rainwater into the aqueduct. However, the farmers have expanded their farmland into the aqueducts. In some places, they have formed small banks to extend the contour banks themselves to protect the expanded farmland. As a result, the aqueduct's width narrows and a high fluid volume is concentrated in a small channel, thus furthering erosion within the aqueduct and around the aqueduct.		

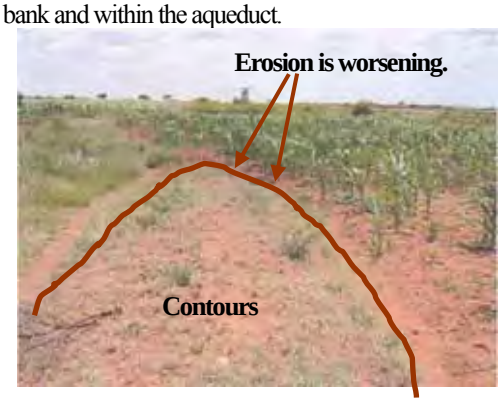
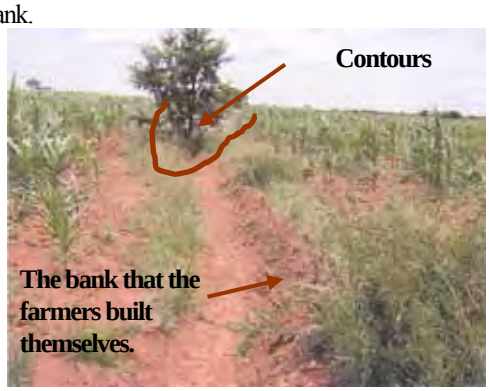
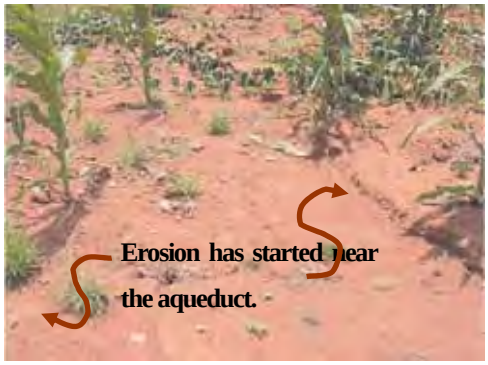
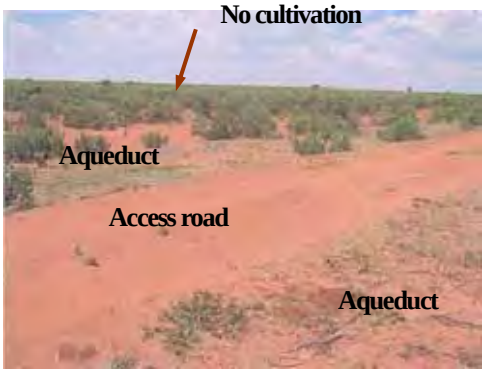
Site	Makgoba (2/2)
This should not happen if the extension officers provide guidance and farmers are well organized. ▼Crops are planted beyond the area protected by the contour banks and in what was originally intended as the aqueduct.  ▼The farmers are planting their crops beyond the contour bank and within the aqueduct.  	▼The farmers built a small bank to extend the contour bank.  ▼Erosion is worsening near the aqueduct. 

Table 5-5 Current status of soil conservation projects inside and outside the target region (Boekenhoutlaagte)

Site	Boekenhoutlaagte
An access road has been built at the center of the aqueduct. Vegetation on the aqueduct is rather patchy. The problem is that there is no cultivation practiced in the site. When the project first started it seemed that the land would be cultivated, but this did not happen because there was a dispute with the neighboring community and they could not come to terms so farming was abandoned and the land was made into grazing land. This kind of problem would not have occurred if there had been good communication between the relevant communities when the project first started.	▼There is no farming at all in the region. 

3.1.3 Water Resource

(1) Surface Water

The target area is composed of the catchments of Olifants and Lepellane rivers, and tributaries of Olifants and Lepellane. Except the mainstream of Olifants river, most streams in the target area dry in the dry season and when it does not rain. However, in the upstream of Lepellane river and the wetland of Leolo plateau, a certain amount of surface water flows throughout a year, and moisture content of soil in this area is high. Lepellane river upstream and Leolo plateau is an area of high potential water availability.

(2) Groundwater

Geological features and existing borehole data for the target area show the groundwater potential to be low (0.5 - 3.0 l/s yield, 30 - 60% success) in the northern half of the target area and moderate (1.5 - 10.0 l/s yield, 40 - 70% success) in the east part of the target area (DWAF report, 1991). The groundwater quality is generally good, but the DWAF report shows that the quantity and quality varies from site to site. If a new well was built, the maximum volume of water would be about 2-5 l/s (report on survey of groundwater development in Tjatane and Ga-Kgopane, 2006). There is no rainfall in the target area, very little rainwater actually penetrates the ground and there is little groundwater recharge, so there is little potential for new groundwater development.

The alluvial sands of the Mohlaletsi and Lepellane rivers and the secondary aquifers of fractured and weathered rocks are possible water sources. However, 40% of the existing boreholes indicate high nitrate concentrations (of more than 600mg/l) which are unacceptable for domestic use. Therefore, careful verification and detailed survey of the groundwater potentiality is needed. (“Groundwater Evaluation of the Mohlaletsi & Lepellane catchment.” DWAF, 1998.)

3.1.4 Physiographic Regions

The figure 3-6 on page 3-15 is a physiographic regions map drawn up in 1972. This map classifies the land with elements, such as landform, elevation, soils, vegetation and climate. Although the map was prepared many years ago, it is very useful even now, as it was evaluated from such multiple points of view.

Moreover, as shown below, an evaluation of dryland crop productivity among different physiographic regions was also undertaken when the map was made. According to this evaluation, D3 estimated as moderately productive extends 18,278 ha and C2 considered as moderately low 23,465 ha, with total of 41,743ha suitable land for cultivation in the target area. In terms of the suitability for irrigation, the evaluation of C2 is high or moderately high, while that of D3 is moderately high. (See Table 3-6, Figure 3-6)

Table 3-6 General Assessment of Agricultural Potential from Physiographic Condition

Map symbol	Dryland Crop Production	Suitable land for irrigation	Estimated area	
C1	Largely non arable	Largely non arable	7,410ha	6.0%
C2	Moderately Low on the deep lighter textured soils	High or Moderately High	**23,465ha**	19.0%
D1	Largely non arable	Largely non arable	19,637ha	15.9%
D2	Low; Moderately Low on rare selected soils	Low; small areas with a Moderately High potential	21,366ha	17.3%
D3	Moderate on the deeper medium and lighter textured soils	Moderately High; High on selected deeper soils	**18,278ha**	14.8%
E1	Low; Moderately Low on selected soils	Low; small patches with a moderately High potential	17,908ha	14.5%
E2	Low; Moderately Low on rare selected soils	Low; limited areas with a High or Moderately High potential	10,004ha	8.1%
Other			5,434ha	4.4%

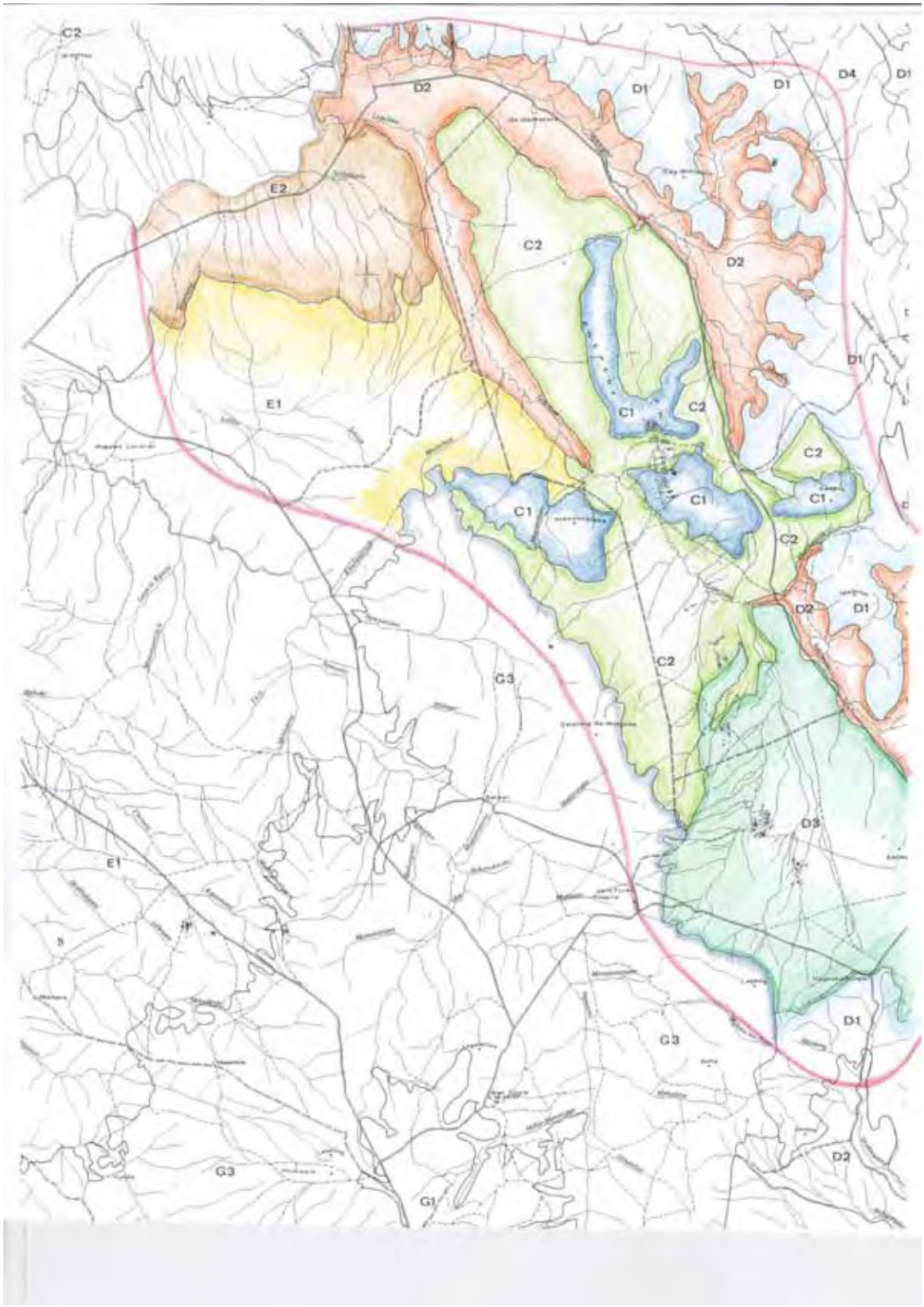


Figure 3-6 Physiographic Regions Map

3.1.5 Land Use

(1) Land Use by GIS

The Department of Water Affairs and Forestry (DWAF) has prepared the land use map on the next page by analyzing satellite images. (See Figure 3-7) The map has the following set of classification of land use:

- Cultivated: permanent-commercial dry land
- Cultivated: temporary-semi- commercial/subsistence dryland
- Degraded: forest and woodland
- Degraded: thicket & bushland (etc)
- Dongas & sheet erosion scars
- Thicket & bushland (etc)
- Water bodies
- Wetlands

The agricultural land use may not be readily understood because most farmland is mixed with grazing land. In-field verification is required for drawing a more detailed and reliable land use map based on GIS.

(2) Land Use by Statistical Data

The statistical data of the target area was not compiled for the last ten years. The latest data was gathered by the Lebowa Government Service in 1991/92, as shown in Table 3-7. According to this information, the total space of the target area was estimated 1,200 km^2, of which 80% was grazing land. The arable land used for food crop production covered about 16,000 ha or 14 % of the total area. However, it is generally believed that land actually used for agriculture has been far less than these figures.

Table 3-7 Land Use in the Schoonoord in 1991/92

Land Use	Schoonoord* Area (ha)	Estimated** Area (ha)	Area (%)
Arable land	23,717	18,244	14.78
Available dry land	21,984	16,911	13.70
Available irrigation land	1,733	1,333	1.08
Forestry	0	0	0
Woodlot	10	8	0
Grazing Land	133,407	102,621	83.12
Nature Reserves	2,766	2,128	1.72
Waste Land	600	462	0.37
Total	160,500	123,462	100.00

*The administrative district of that time: **Schoonoord is 1.3 times of the our target area

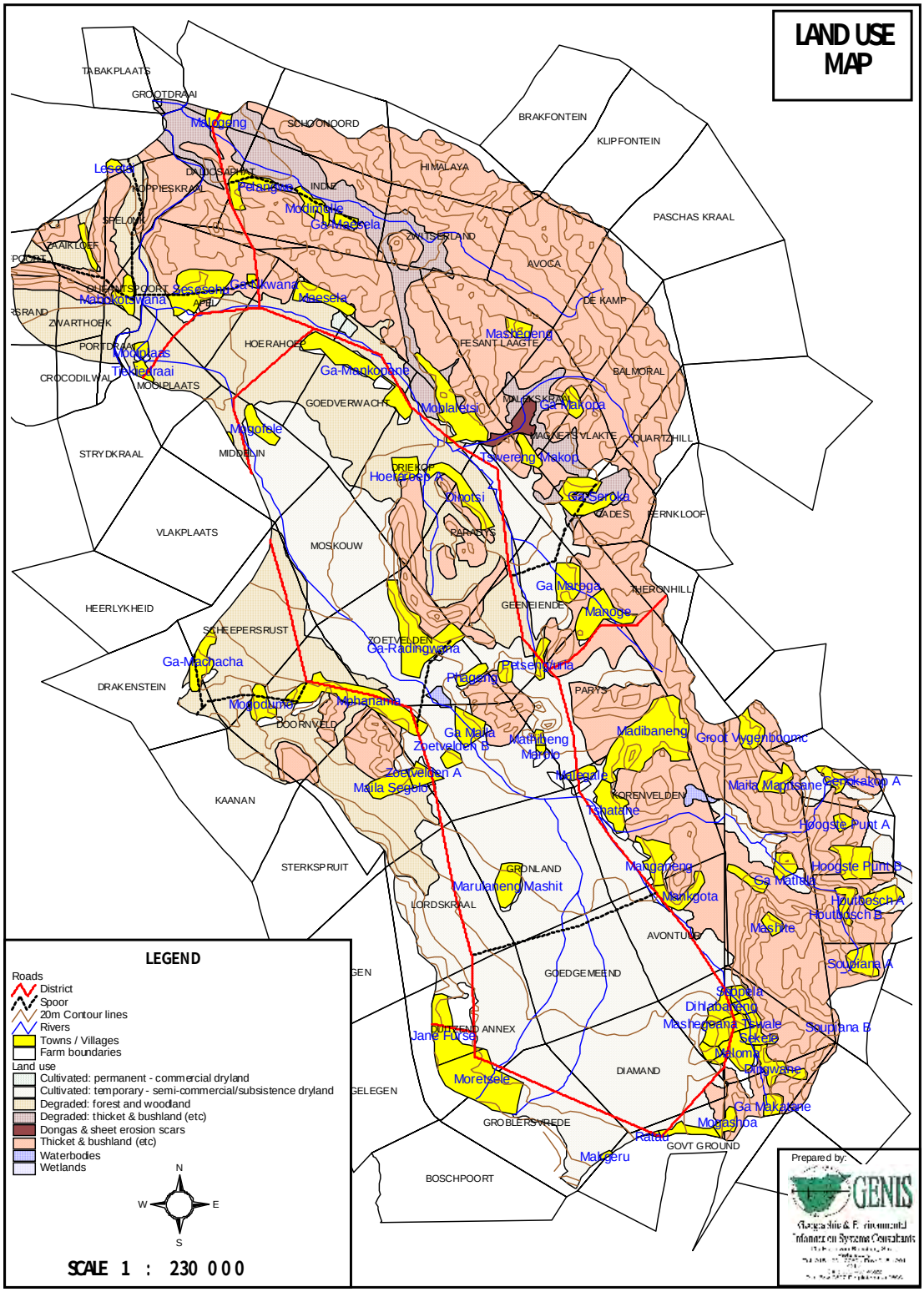


Figure 3-7 Land Use Map by GIS

3.2 Agricultural Production

3.2.1 Productivity

Sekhukhune District has recorded a sluggish economic growth in the last decade and now ranks as one of the poorest districts in Limpopo Province. According to the census, growth centers in the district economy have been services that make up more than 50% of the economy's total production. While the service, mining, and trade/ catering sectors have been on the rise, agriculture has been stagnant. Especially, owning to the deterioration and malfunction of irrigation schemes, local agricultural production has fallen considerably. The comparison with other sectors highlights the fact that agriculture is one of the least contributing sectors in the target area. Table 3-8 shows the sectors' shares in the district economy from 1994 to 2000.

Table 5-8 Gross Geographic Product of Sekhukhune District (Unit: 1,000 rand)

	1994	1995	1996	1997	1998	1999	2000	
Agriculture	20,292	11,472	10,828	9,060	11,607	11,295	12,074	0.5%
Mining	54,395	304,975	340,825	385,950	433,274	447,409	510,348	19.7%
Manufacturing	33,255	30,564	35,650	45,420	46,311	52,220	60,532	2.3%
Electricity / Water	2,109	39,849	46,002	59,635	76,797	84,431	97,098	3.7%
Construction	21,097	10,717	13,416	14,707	13,440	12,938	10,888	0.4%
Trade / Catering	26,304	215,203	253,344	284,010	363,923	409,551	450,398	17.4%
Transport	13,270	50,026	56,029	70,793	74,507	77,737	80,708	3.1%
Finance	15,175	5,081	5,348	5,630	6,255	8,979	9,529	0.4%
Services	458,111	799,430	808,253	861,297	1,192,342	1,291,970	1,361,607	52.5%

Source: Census 1994-2000

The team collected the data concerning agricultural production in the target area by conducting interview survey because there is at present no authorized up-to-date data available. The interview survey revealed that the main food crops in the target area are sorghum, millet, maize and legumes. The area used for these food crops is about 10,000 ha in years with normal rainfall. Sorghum is the most produced crop with yield mounting as much as 3,000 ton, followed by millet and maize. For reference, the statistical data of Lebowa Government Service in 1987-92 is shown in Tables 3-9 and 3-10.

Table 3-9 Cropped Area in Schoonoord

	Cropped Area (ha)					
	87/88	89/90	90/91	91/92	Average	Estemated Amount*
Food Crops						
Maize	349	79	47	64	135	104
Sorghum	18,404	13,925	16,060	852	12,310	9,469
Millet	3,364	3,763	3,812	297	2,809	2,161
Wheat	122	60	0	0	46	35
Legume	25	2	0	0	7	5
Groundnut	6	4	7	7	6	5
Industrial Crops						
Sisal	0	160	160	160	120	92
Tabacco	0	0	4	0	1	1
Cotton	0	0	4	0	1	1
Horticultural Crops						
Cabbage	0	4.2	0.5	3.0	2	1
Beetroot	0	2.0	1.0	1.0	1	1
Onion	0	21.0	7.0	2.0	8	6
Carrot	0	0.0	1.0	0.0	0	0
Spinach	0	1.8	1.0	1.0	1	1
Tomato	3	14.0	16.0	13.0	12	9
Sweet potato	0	0.0	0.0	4.0	1	1
Orchard Crops						
Citrus (trees)	0	1,237	1,237	1,237	928	714

Source: Lebowa Government Service * Schoonord is 1.3 times of the our target are

Table 3-10 Production in Schoonoord

	Production (ton)					
	87/88	89/90	90/91	91/92	Average	Estemated Amount
Food Crops						
Maize	182	53	43	27	76	59
Sorghum	6,582	3,342	8,922	365	4,803	3,694
Millet	1,817	1,829	2,389	127	1,541	1,185
Wheat	25	140	0	0	41	32
Legume	3	3	0	0	2	1
Groundnut	1	6	12	3	6	4
Industrial Crops						
Sisal	0	22	18	10	13	10
Tabacco	0	0	4	0	1	1
Cotton	0	0	4	0	1	1
Horticultural Crops						
Cabbage	0	0.47	1.00	8.16	2	2
Beetroot	0	0.31	1.00	11.13	3	2
Onion	0	1.40	16.00	6.68	6	5
Carrot	0	0.00	1.00	0.00	0	0
Spinach	0	1.90	0.16	2.72	1	1
Tomato	3	11.35	18.00	16.00	12	9
Sweet potato	0	0.00	0.00	0.48	0	0
Orchard Crops						
Citrus	0	0	3	3	2	1

Since dryland farming which comprises the largest area is hampered by limited and unreliable rainfall, per ha sorghum yield is as low as 0.3〜0.4 ton. The statistical data of Lebowa Government Service in 1987-92 recorded the standard yields of the main crops cultivated in

this area as shown in Table 3-11.

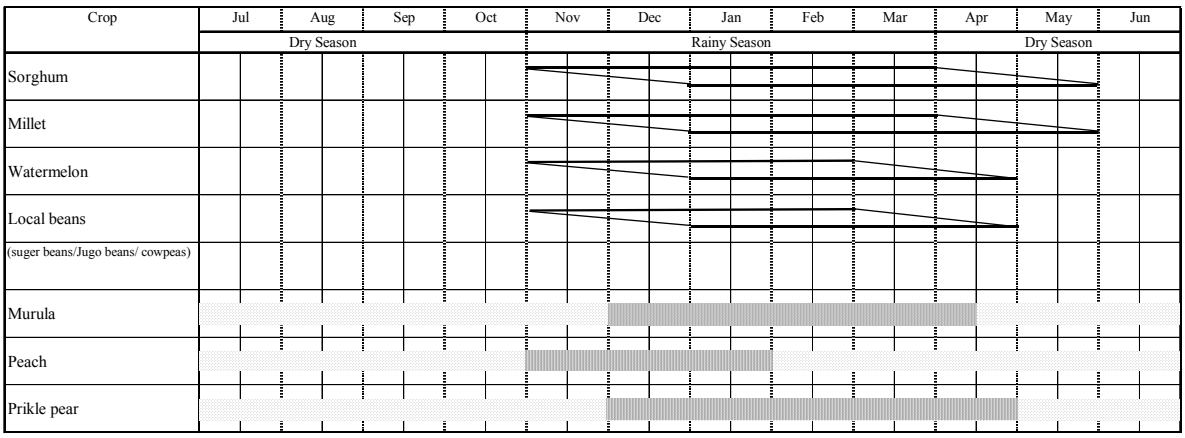
Table 3-11 Yield in Schoonoord

	Yield (ton/ha)				
	87/88	89/90	90/91	91/92	Average
Food Crops					
Maize	0.52	0.67	0.91	0.42	0.63
Sorghum	0.36	0.24	0.56	0.43	0.40
Millet	0.54	0.49	0.63	0.43	0.52
Wheat	0.20	2.33			1.27
Legume	0.12	1.50			0.81
Groundnut	0.17	1.50	1.71	0.43	0.95
Industrial Crops					
Sisal		0.14	0.11	0.06	0.10
Tabacco			1.00		1.00
Cotton			1.00		1.00
Horticultural Crops					
Cabbage		0.11	2.00	2.72	1.61
Beetroot		0.16	1.00	11.13	4.10
Onion		0.07	2.29	3.34	1.90
Carrot			1.00		1.00
Spinach		1.06	0.16	2.72	1.31
Tomato	1.00	0.81	1.13	1.23	1.04
Sweet potato				0.12	0.12
Orchard Crops					
Citrus (kg by trees)			2.43	2.43	2.43

3.2.2 Crops and Cropping Pattern

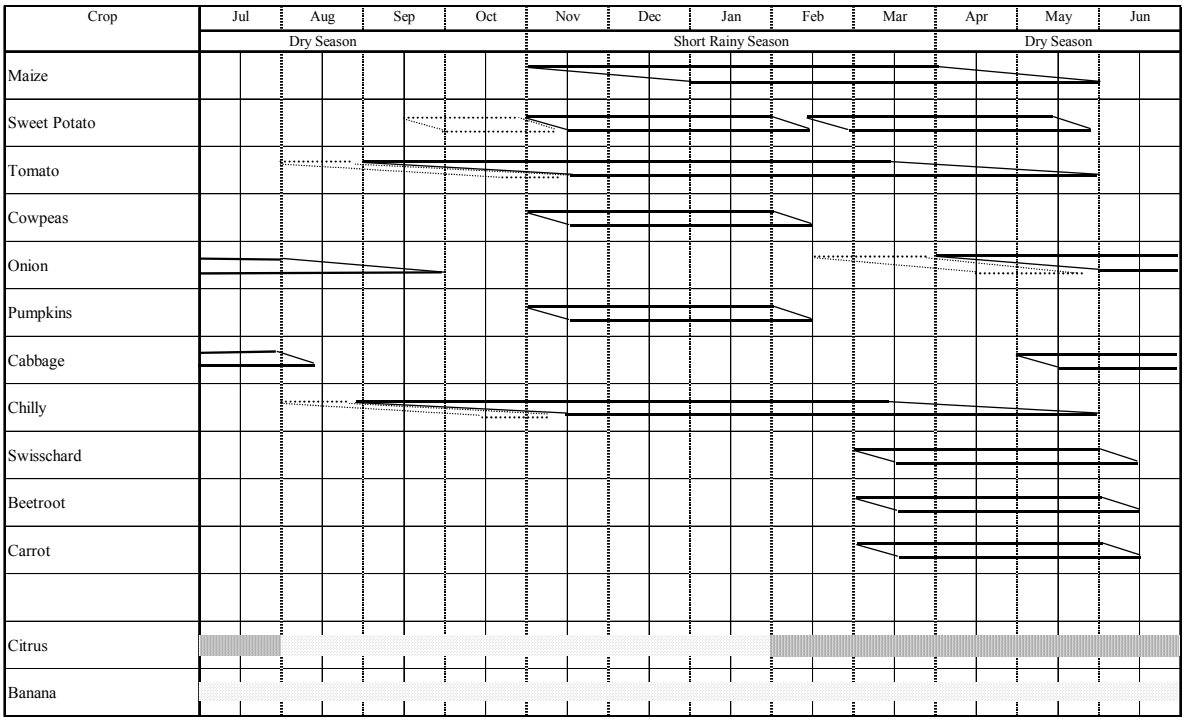
Seasonal cropping pattern prevailing in the target area is that sorghum is extensively cultivated as a dryland crop, with millet, local watermelon and local beans as supplements during the rainy season. Some farmer raise fruit trees include marula, peach, and cacti. General dryland cropping calendar in this area is shown below.

Figure 3-8 Dry land Cropping Pattern for Study Area



On the other hand, general cropping calendar in irrigated fields within the target area looks like one shown below. Many kinds of vegetables are cultivated all the year round.

Figure 3-9 Cropping Pattern for Study Area under Irrigation



3.2.3 Farm Management

(1) Land Holding

The population pressure in the target area has been high, actually resulting in a reduction of farm size. Most households have the land title in the range of 0.1-2ha, and the average cultivated area is now only 0.33ha per household. Some medium-sized land holding from 3 to 8ha is usually owned by relatives of tribal leaders and other prominent members of the community.

(2) Farm Management Types

The farm management types were identified by focusing on production method. Two types are recognized in the area. The first, the commercial type engages in cultivation of vegetables on limited areas but with considerable inputs. The areas which have easy access to a market and to a water source can have advantages in vegetable cultivation even though production costs are high due to low soil fertility and necessity of pest and disease controls. Farmers in such areas cultivate vegetables throughout a year using chemical fertilizer, organic manure and

agro-chemicals. This type of farming can be seen in the small irrigation farming areas.

The other type is the self-consumption type, low-input cultivation of crop in the dryland farming area and the Olifants irrigation scheme area. The large areas are used for food crop production during the rainy season. Most farmers in these areas do not use any chemical fertilizer, organic manure or agro-chemicals. Crop yields usually low, because of low natural soil fertility as well as high occurrence of damage by birds.

Commercial Type

Most farms of this type are seen mainly in small irrigation farming area. (1) through (3) in Table 3-13 show some of the typical farm budgets of this type. The characteristics of management style of this type are, 1) managed by male-headed households, 2) field is irrigated, 3) large investment, 4) use of employed labor force, and 5) existence of an additional income source (e.g. (1) and (3) in Table 5-13 do tractor plowing service business, 2 has a watch store)

Self-Consumption Type

There are various types of farm economy in this category. (4) through (7) in Table 3-13 show ones of the typical farm budgets falling into this category. Especially, (7) is the most typical farm economy type in the target area. The characteristics of this farm economy type are, 1) managed by a female; (except for 5, 6), 2) rain-fed field; (except for 4), 3) main work is done by the family labor, and 4) small investment.

(3) Input Supply

The majority of farmers individually purchase agricultural inputs such as seeds, fertilizers and chemicals from farm supply shops and cooperatives in Potgietersrus, Lydeburge, Marble Hall and Polokwane. Others, such as those at community gardens, buy inputs in group of 5-10 members to bargain better prices and reduce transport costs. Some farmers or farmers groups purchase inputs with loans from the Land Bank.

Seeds, Fertilizers and Agro-Chemicals

Most of the grain and bean seeds are self-supplied by cultivators from the left-over of the previous season, but seeds of improved varieties are used by some farmers. Most vegetable seeds are procured from farm supply shops in towns. About 10% of grain farmers and most of the vegetable farmers use both fertilizers and agro-chemicals. The amount of chemical fertilizers used for vegetables has reached appropriate dosages.

Table 3-13 Typical Farm Budget

Year	2002	2001	2002	2002	2001	2002	2000
	1. Horticultural Farmer under Irrigation	2. Horticultural Farmer under Irrigation	3. Horticultural Farmer under Irrigation	4. Crop Farmer under Irrigation	5. Crop Farmer Under Rain-fed	6. Crop Farmer under Rain-fed	7. Crop Farmer under Rain-fed
Name of Village	Nchabeleng	Schoonoord	Mohlalest	Strydkraal B	Mabma	Leob	Thobehlale
Family Members	5	13	8	6	8	10	8
Land for Agriculture Use							
Irrigated Field	3.6 ha	5.3 ha	2 ha	1.28 ha	3.7 ha	1 ha	
Upland Field		2.9 ha					2 ha
Fallow Land			5ha				
Main Crop	Tomato	Tomato / Onion	Tomato / Onion	Maize	Sorghum	Maize / Sorghum	Sorghum
yield / ha	17.5 ton	10 ton / 20 ton	7 ton / 8 ton	0.875 ton	0.822 ton	2.2 ton / 1.3 ton	0.3 ton
Income							
Crop Products							
Sold	75,600	34,760	5,100		3,500		
Home Consumption		3,600	1,000	2,660	9,800	5,188	2,625
Gross Income	75,600	38,360	6,100	2,660	13,300	5,188	2,625
Expenditure							
Seed & Seedling Cost	2,700	2,790	400	600	660	314	
Fertilizer Cost	3,600	600	275		1,794	240	
Agricultural Chemicals Cost	4,614	800	1,500			150	
Land Plowing Cost	360	2,050	500			220	600
Miscellaneous Material Cost	8,600		200			120	100
Light, Heat and Power Cost							
Water Utilization Cost	0	750	2,000	69-			
Maintenance Cost of Building							
Maintenance Cost of Machine	1,600	1,400	200	110	443		
Land Improvement Cost	576						
Tax							
Paid for Emptied Workers	8,400	4,500	2,500	1,140	3,600		100
Capital Interest		1,000					
Agricultural Machinery Depreciation	2,000	800	200		443		
Building Depreciation							
Total Expenditure	32,450	14,690	7,775	2,860	7,754	1,044	800
Agricultural Income	43,150	23,670	□ 1,675	□ 200	5,546	4,144	1,825

Farm Machinery

About 90% of farmers plough their land by tractor and the remainder by donkey. Other cultivation work is done by hand, as the majority of the farmers use hand-hoeing for weed control. Most of tractors are privately owned. Table 3-12 shows the number of tractors in the target area in 1991/92.

Table 3-12 Agricultural Machinery in Schoonoord Area

Crop	Departmental (Estimated No*)	Local Government (Estimated No)	Private (Estimated No)
Tractors	8	3	174
	(6)	(2)	(134)
Implements drawn by tractor	25	0	63
	(19)	(0)	(48)

Source: Lebowa Government Service, 1991/2 *1.3 times the target area

(4) Marketing of Agricultural Products

Agricultural products unconsumed at home are sold locally. Farmers directly sell their products to neighbours or at market. Sometimes, they sell to vendors who in turn sell them in a village or at a market. Market is opened once a month on a specific day of pension payment with a visit of the government pension-providing automobile. Many vendors, including farmers, join this market. The market consists of several sections including grocery, cereals, vegetables and fruits. In the crop and vegetables section, on average, 10~20 vendors are doing business. Most of the local vendors stock the commodity outside the target area. In villages which do not have this kind of market nearby, a few vendors sell horticultural products at the roadside or in the front yard of their house. (See Photo 3-2)

Photo 3-2 Scene in a Mobile Market

Many foods come from outside the target area - typically Polokwane (100 km away), Tubatse (40 km), Lydenburge (100 km), Marble hall (80 km), Groblersdal (100 km) and Ohrigstad (80 km).

In the target area, vegetables and fruits sold at the bus station are also brought by big lorries from out of the province and thus the prices of foods at the bus stations are frequently even twice higher than in Polokwane. Prices of commodities and stocking places of local vendors are shown in the following table.

Table 3-14 Result of Market Survey

Mobile Market, Schoonord Market and Jane Furse Market					Polokuwane Market	
Description	Price (Rand)	Unit	Stocking Place		Price (Rand)	Unit
			Inside of target area	Outside of target area		
Maize grain	2.5	kg		Lydenburg	-	
Sorghum grain	5.0	kg	Maleese	Lydenburg	-	
Millet grain	7.5	kg	Maleese		-	
Maize flour	3.3	kg			2.8	kg
Wheat flour		kg			4.2	kg
Millet flour		kg			-	kg
Sorghum flour	6.5	kg	Maleese		-	kg
Rice	5.0	kg		Lydenburg/Polokwane	3.3	kg
Yugo beans	8.0	kg		Polokwane (Zimbabwe)	5.4	kg
Sugar bean	10.0	kg	Leolo	Lydenburg/Polokwane		
White bean	10.0	kg		Lydenburg		
Groundnuts	10.0	kg	Leolo	Lydenburg/Polokwane	7.9	kg
Banana	5.0	kg		Marble Hall/Bushbuckrige	2.2	kg
Sweet potatoes	3.4	kg		Tubatse	3.2	kg
Irish potatoes	2.3	kg		Marble Hall/Burgersfort	2.2	kg
Cabbage	4.0	1head		Marble Hall/Burgersfort	3.7	1head
Tomato	5.0	kg	Maleese	Marble Hall/ Tubatse/ Burgersfort/ Hoedspruit	3.6	kg
Onions	2.5	kg		Marble Hall/Burgersfort	2.3	kg
Swisschard	3.0	1banch	Ga Nchabeleng		2.6	1 bunch
Beetroot	4.0	1banch	Ga Nchabeleng		2.8	1 bunch
Orange	1.3	kg		Marble Hall/ Polokuwane/ Burgersfort	1.1	kg
Avocado	5.0	kg		Zwaziland	3.1	kg
Sugar cane	1.0	1stem	Strydkraal		-	
Tobacco	10.0	kg		Ohrigstad	-	
Beef	20.0	kg		Groblerscdel	20.0	kg
Chicken (Live)	25.0	1chicken	Schoonord		19.0	1chicken
Chicken	25.0	1chicken		Groblerscdel	24.0	1chicken
Milk	6.0	liter		Groblerscdel	5.9	liter

3.2.4 Agricultural Infrastructure

(1) Water Source - Surface Water

To develop surface water, several dams have been constructed in the target area. The attempt of small-scale water harvesting has been also made in some areas to collect flood water and rain water for domestic use and watering gardens.

The area of high potential water availability is Lepellane river upstream including the wetland of Leolo plateau. Lepellane and Nkadimeng dams were constructed to secure water source from that high potential area for irrigation or domestic use. Also, several small dams have been constructed for domestic use and livestock. However, these dams with plagued with the problem of soil sedimentation.

Particularly, Lepellane dam which lies at the middle of the target area is entirely silted up by now and has no practical use at the time of the survey. Under such situation, even in case of a small flood, runoff water overflows the spillway, which may bring severe damage to downstream areas. Actually, a bridge located just downstream side of the spillway was destroyed by a relatively minor flood on 25 November, 2003. The current condition of soil sedimentation in the dam is indicated by the following values:

Table 3-15 Specifications of Lepellane Dam

Original capacity	10.274 million m^3
Effective capacity as of 1997	1.25 million m^3
Estimated water depth	less than 3.0 m
Height of the embankment	23.0 m
Projected year of being filled up	2005 (in the case of maximum silt load)
	2045 (in the case of minimum silt load)

Source: DWAF, Survey report by Consult Bureau

The problems of the dam are:

- All of the intake gates are not functioning because they are now under sediment.
- Flood water overflows the dam and goes away downstream unused.
- The downstream areas have more and more risk of being damaged by larger and more frequent floods because of no flood control capacity of the dam.
- The downstream slope of the embankment has no protection by vegetation.
- The spillway has been damaged and water is seeping out through it.
- Only seepage water is used downstream for the Lepellane irrigation scheme.

The reasons for damage to the spillway are:

- Weathered rock on the surface of the downstream riverbed was washed away by floods.
- Flow rate and frequency of floods overflowing the spillway have increased because of the silting-up of the dam.

(2) Water Source - Groundwater

With or without assistance of Non Governmental Organizations (NGOs) and the government, communities in the target area have installed a number of boreholes for domestic use and for

watering livestock and gardens. However, quite a few of those boreholes are not well managed and maintained primarily due to lack of community capability to do so.

(3) Irrigation Scheme

There exist two large irrigation schemes, the Olifants Irrigation Schemes and the Lepellane Irrigation Scheme. Table 3-16 provides some description for these schemes. LDA has been implementing a programme called RESIS to revitalize deteriorated irrigation schemes in the whole province, including the ones in the target area.

Table 3-16 Current Situation of the Existing Schemes

Scheme		Location	Area (ha)	Current condition
Olifants irrigation schemes	Mooiplaats	Right bank of Olifants river	102.94	Cultivation is widely practiced in several gardens. WUA is not established. Only 10% of the feeding pipes for sprinklers remaining; others lost.
	Strydkraal A & B	Right bank of Olifants river	237.89	Maize cultivated in 58 ha by 39 farmers in 2003. Supplemental pump, installed on Olifants river bank, was broken by a flood, but is now reinstalled. Only 10% of the feeding pipes for sprinklers remaining, others lost. WUA is not established.
	Haakdoorndraai, Vlakplaats A & B	Right bank of Olifants river	186.00	Not cultivated due to non-registration of electricity. WUA is not established.
Lepellane		Right bank of lower reach of Lepellane river	342.10	Insufficient water due to unavailability of Lepellane dam water. Furrow irrigation practised because of breakage of centre pivot. The long-distance irrigation canal is not well-maintained, with reduced capacity due to soil sedimentation. WUA is not established.

Note: The area shown is the planned irrigable area, not the actually cultivated area.

3.3 Farming Area

Farming area of the target area can roughly be divided into three, the area under the irrigation schemes, the dry land farming area and small-scale irrigation farming area. Each farming area is shown on the following figure.

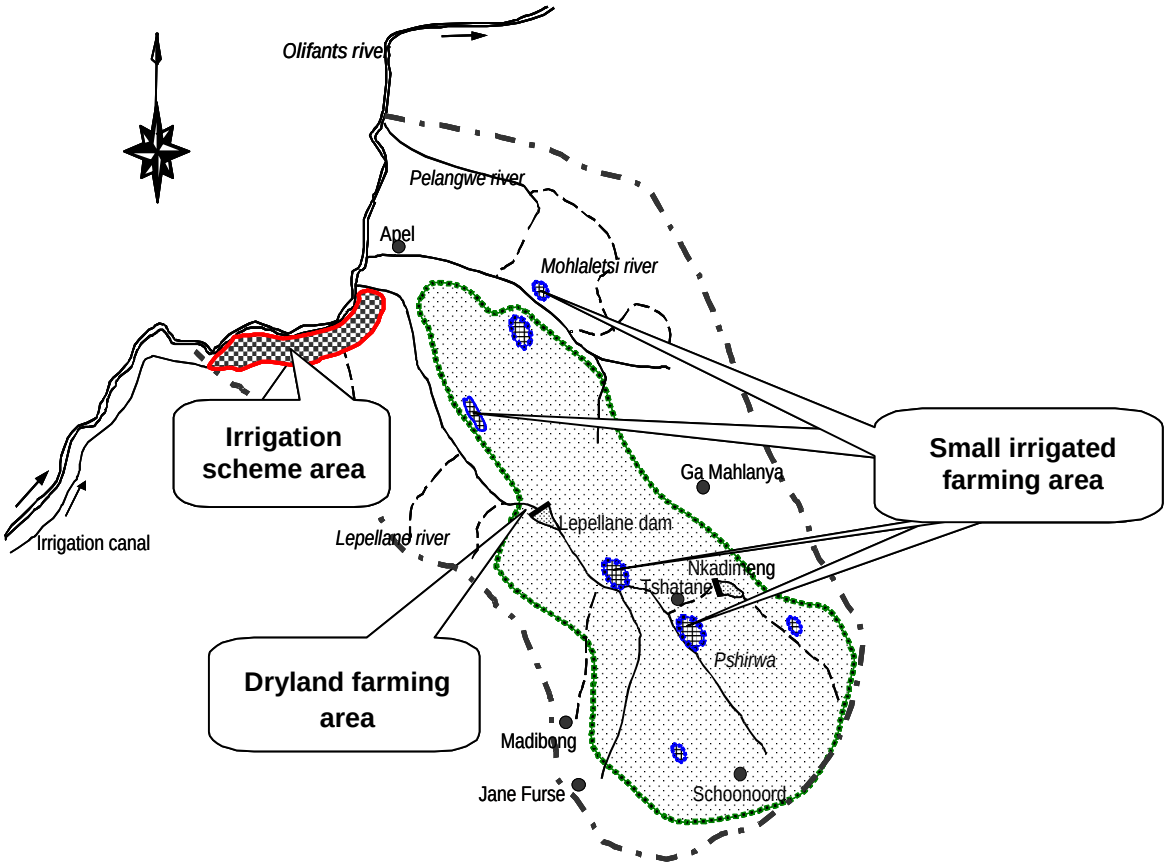


Figure 3-10 Farming Area

3.3.3 Irrigation Schemes Areas

The Arabie-Olifants River Irrigation Scheme is situated on the bank of the Olifants river, extending from Arabia Dam in the south to the confluence of the Lupulin and Olifants Rivers in the north, a distance of approximately 70 km. The target area is located at the lower part of this irrigation scheme. (See Table 3-17 and Figure 3-11)

Table 3-17 Irrigated Land at the Initial Stage

	Total land	Number of farmers (women)	Average size of plot
Wonderboom	115.00ha	80(--)	1.44ha
Vlakplaats	75.00ha	80(--)	0.94ha
Haakdoringdraai	111.00ha	87(--)	1.27ha
Strydkraal A&B	237.89ha	189(175)	1.26ha
Mooiplaats	100.94ha	84 (75)	1.20ha
Lepellane	342.10ha	340(306)	1.00ha

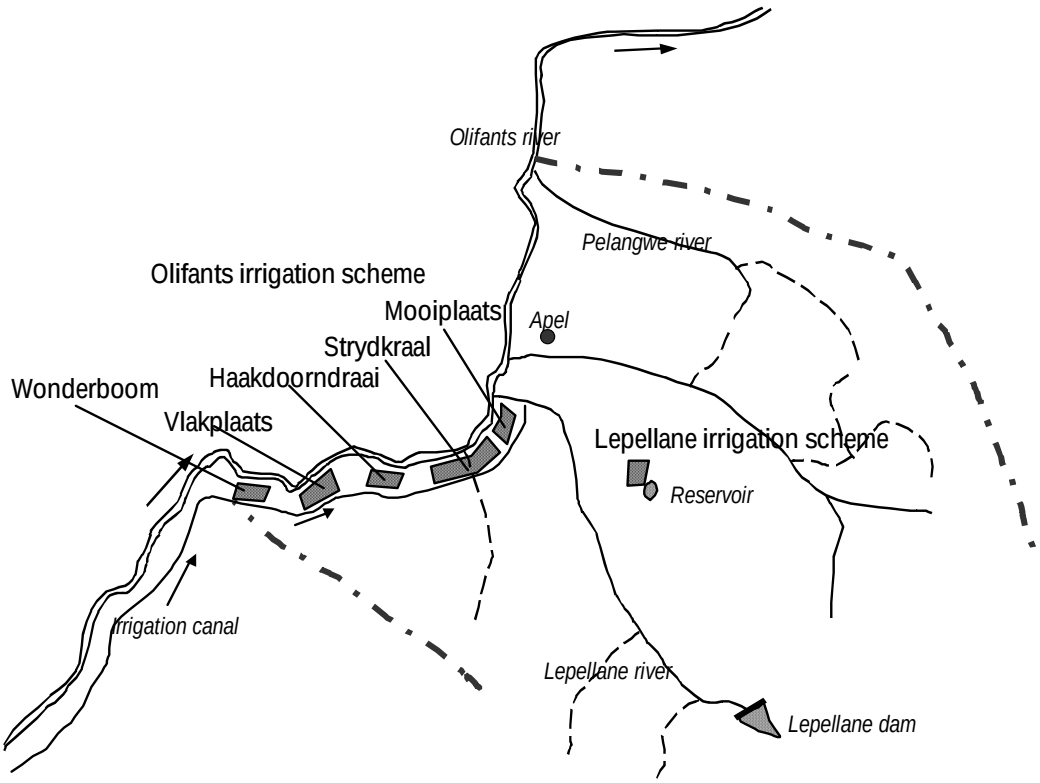


Figure 3-11 Irrigation Schemes in the Target Area

The scheme was established in 1946/47 with the aim to provide employment and generate income in the area. It focused on the production of staple food with the objective of achieving local food self-sufficiency.

Because of a perceived lack of entrepreneurial and managerial abilities amongst farmers and a philosophy of "optimal resource use", an approach was taken to the establishment of large-scale, externally managed projects, with little or no community participation. In a later adaptation process to encourage farmers' participation, projects were adjusted to settle selected laborers as project farmers under the central management.

Initially, furrow irrigation was used in the scheme. During 1983/84, the irrigation system was upgraded to sprinkler irrigation and center pivot. The Agriculture Management Service (AMS) had managed the scheme directly, supervised by the government.

The scheme was handed over to the Agriculture and Rural Development Corporation (ARDC) in 1993. ARDC acted as a facilitator assisting in the provision of loans, mechanization, training,

marketing, technical advice and extension. The total irrigated area is about 900 ha with about 800 farmers with about 1ha plots each. The scheme faces tremendous problems since the government support in terms of credit and service provision supplied through ARDC has been reduced substantially. Most farmers dropped out of production.

The present irrigated land situation is in Table 3-18, and the main occurrences at irrigation schemes, collected by interview survey, are in Table 3-19.

Table 3-18 Present Irrigated Land Situation

	Present cultivated land under irrigation	
Wonderboom	0 ha	It was destroyed so that restructuring is required.
Vlakplaats	0 ha	It was destroyed so that restructuring is required.
Haakdoringdraai	0 ha	It was destroyed so that restructuring is required.
Strydkraal A&B	58 ha	Use is possible with a little rehabilitation.
Mooiplaats	0 ha	Use is possible with a little rehabilitation.
Lepellane	5 ha	It was destroyed completely including the dam

Table 3-19 Main Occurrences at Irrigation Scheme

	Strydkraal A, B & Mooiplass	**Lepellane**
1946/47	The scheme was established. Irrigation by furrow system	
1952	Floods	
1953	Floods	
1954	Floods	
1960	The earth furrows were changed to the cement furrows	
1964	Heavy rain, floods, hail	
1966		Furrow irrigation was established.
1979-86	The fields, fences etc. were destroyed several times by tribal clashes.	
1981	Cholera infections	
1982	Famine. Large herds of livestock were killed	
1984	Furrow irrigation was changed to sprinkler irrigation.	Introduction of center pivot.
1986	Serious drought	
1988		Problems of arrears arose with AMS
1989		Stop irrigation by center pivot.
1992	Dispute arose between farmers and AMS.	
1993	AMS withdrew the management. Farmer's association formed	
1994	Some of pumps and tractors were broken	
1996	Flood destroyed irrigation equipment	
1997	Cultivation abandonment except 58ha	

Notes:

1946-83: Department of Agriculture managed the farm directly.

1984-92: AMS managed the farm directly, supervised by Department of Agriculture.

1993: ARDC handed over the management of farm, cooperated with the community farmers.

Now, the rehabilitation plan is going on in these areas. However, it seems that many farmers are not motivated to grow crops in the irrigated area. If the rehabilitation plan proceeds or is promoted to hastily, these is a high possibility of repeating the same errors of the past.

3.3.4 Dryland Farming Area

Although the dry land farming area is spread in all over the whole target area, as shown in the figure 3-12, it can be divided into three areas by the difference in rainfall.

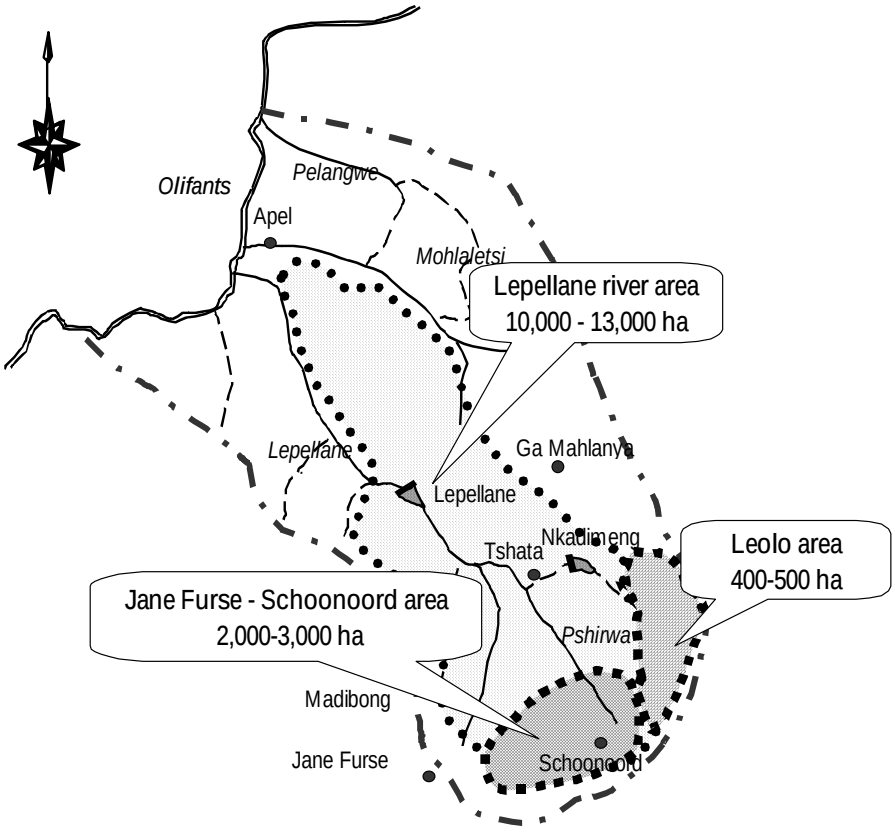


Figure 3-12 Dryland Farming Area

(1) Lepellane River Area: (Available Arable Land 10,000-13,000ha)

This is the area with the largest available arable land (10,000-13,000ha). It, however has very low rainfall and is highly susceptible to drought. During the drought of 2002/2003 hardly any lands were cultivated. The area has very low agricultural potential.

Few types of crops are cultivated; sorghum and millet comprise more than 95%. Rough cultivation is practiced using, home grown seed, no-fertilizer and direct mixed sowing. Although this method can be said as rational for avoiding the risk of a drought, there seem to be possibilities of adopting new crops and new varieties.

(2) Jane Furse - Schoonoord Area: (Available Arable Land 2,000-3,000ha)
In this area sorghum is cultivated as well. However, the area has a higher rainfall, and cultivation could be performed in a drought year. Although the agricultural technique does not change much with the above-mentioned area, there are a few farmers who purchase seed and fertilizer.

(3) Leolo Area: (Available Arable Land 400-500ha)
Generally, maize can be cultivated in this area, as the altitude exceeds 1,000m with increased rainfall more. Peach trees also can be seen, as the temperature is relatively low. The area has a high agricultural potential.

However, there is a limited suitable land for cultivation because of the rocky and steep geographical features. Road condition is the worst in the target area.

3.3.5 Small-Scale Irrigation Farming Area

For sustainable cropping in the study area, irrigation is essential and is required in most part of the year except a few months in the rainy season. It is observed that farmers watered crops during almost all the growing period. These farmers irrigate their own small plots by portable engine pump. Present irrigated fields are generally located within close distance to some water sources due to the convenience of watering. Water sources for the watering are borehole and stream flow.

These farmers mainly produce vegetables, aimed for commercial purpose. Although the area is small, various crops are seen. There are a few farmers who are performing good vegetable cultivation with strong entrepreneurship. But they still face some difficulties such as shortage of credit, lack of technical support and limited market. Farmers who perform this kind of agriculture in the target area are very limited in number. It may be less than 50 framers with the total area of 200 ha.

In addition, the vegetable cultivation using small-scale irrigation is seen also in the community gardens supported by LDA or NGO. Women take the lead and grow vegetables in these community gardens in small plots. The lists of active community gardens are shown in Table 3-20.

Table 3-20 Community Gardens (Total area 2-3ha)

Name of group	Place	No. of male	No. of female
Maila	Ga-Mailamapitsane	5	19
Maute	Strydkraal		21
Mapuwe	Mphenama	1	17
Phashe Paradys	Mohlaletse	3	9
Mpepu	Radingrane		32
Arethusaneng	Strydkraal		21
Dithstwanery	Mphenama		46

3.3.6 Others

(1) Backyard Garden

Backyard garden is very common in the target area, most household grow sorghum, millet and watermelon for home consumption. Although the backyard garden plays an important role of food security, not many vegetables are produced due to lack of water resources.

(2) Commercial Farm

There is a commercial farmer in the area. The farmer grows maize on about 100 ha, leased from the chief of Strydkraal B.

3.4 Agricultural Potential and Grain Supply-Demand Balance

3.4.3 Agricultural Potential of Target Area

The agricultural potential of each farming area was assessed from the current land use and physiographic map (soil types, climate, vegetation, landform and elevation). Details of the assessment are in Table 3-21.

Table 3-21 Potential of Each Area

Area classification		Used land of 2003*	Potential of arable land	Condition
1	Irrigation scheme area	58ha	1,000ha	Irrigation rehabilitation plans would be carried out.
2	Small irrigation farming area	<200ha	300 - 400ha	It is assumed that water would be used effectively.
3	Dry land farming area	<1,000ha	10,000 - 16,000ha	It is assumed that is obtained sufficient rainfall.

* 2003 was drought year. Sorghums were not planted in the most of dry land area.

3.4.4 Estimate of Grain Supply-Demand Balance of the Target Area

In this study the current situation of the grain supply-demand balance (for maize, sorghum and millet) in the target area was analyzed.

The population in the area was estimated at about 200,000. The amount of consumption of cereals is assured to be 160kg per person per year. The total amount of cereal demand in the area is 32,000ton per year.

On the other hand, the current production of maize is less than 600 ton including that of the commercial farm. Sorghum and millet together makes 3,000-5,000 ton in ordinary year. Total production of grain is this 3,600-5,600 ton only, around 1/9-1/6 of the required quantity in the area. It means that most of required food grain depend on from outside.

Assuming that the potential of target area is to be exploited to the maximum, and all irrigation and dry land fields are to be applied to cereals production, it is estimated that production capacities will be 24,000 ton; the irrigated field 1,300 ha x 4 ton x 2 season, and the dry land field 14,000 ha x 1 ton x 1 season. It makes 3/4 of the amounts of the total demand.

3.5 Constraints to Agricultural Development

Agriculture is a minor sector in the target area, and has been stagnant in the past decades. The main reasons lie in: (i) limited size of land holding in the extensive agriculture; (ii) limited resources including water and capital in the intensive agriculture. Especially, lack of rainfall and variable rains discourage people's farming. Each farming area faces a number of constraints for development, which are outlined below.

3.5.3 The Irrigation Schemes: Along the Olifants

The irrigation schemes in the project area face serious difficulties. Many schemes are run down, have low production due to conflict and low motivation among the farmers. This situation has much to do with the way schemes were designed for top-down management and past failure in recognizing the real needs of users. Much of the investment in the past will be wasted unless appropriate measures are taken to convert these schemes to sustainability.

【Constraints for development】

- Lack of strong enthusiasm for agriculture among farmers
- Excessive social support negatively affecting farmers

- Aging of work force and shortage of adult male
- The lack of measures against flood
- Undeveloped water users' association
- Ill-functioning of facilities

3.5.4 Dry Land Farming: All over the Target Area

Farmers cultivate few kinds of crops, with sorghum and millet occupying more than 95% of the arable land. Farming practice such as home seed-raising (native seed), no-fertilizer, and direct mixed sowing are primordial. Although this method can be regarded as reasonable to avoid the risk of drought, there is room of improvement including introduction of new crops and the new varieties. Although agricultural potential in this area is very low, increase in productivity is an important issue for food security and poverty alleviation.

【Constraints for development】

- Low and unreliable rainfall
- Limited choice of cropping patterns
- Low yield and long growth period of commonly used variety of crops
- Aging of work force and shortage of adult male
- Spoiling people by excessive social support of the government

3.5.5 Small Irrigated Farming: Scattered in the Target Area

Farmers produce mainly vegetables for cash. Although the area is limited, various agricultural forms are observed. There are a few farmers who show good performance in vegetable cultivation and have strong entrepreneurship. However, they still face some difficulties such as shortage of financial support and lack of suitable agricultural technical instructions.

【Constraints for development】

- Limited water resources
- Lack of suitable agricultural technical support
- Shortage of financial support

3.6 Factors Constraining Soil Conservation

The factors constraining soil conservation—in other words, those factors that must be addressed to promote soil conservation activities and improve production in agriculture and livestock—can be summarized as shown below.

3.6.3 Constraining factors related to natural conditions

(1) Little rainfall and limited water resources

The average annual rainfall is 400-600mm (average of 500mm). There is little vegetation and the soil has little water retention capacity, so the majority of the rainfall is not stored but instead runs off without being used. Only a small proportion of the rainfall permeates the ground, so the groundwater is not adequately recharged. Accordingly, only a limited amount of surface water and groundwater can be used.

(2) Little vegetation

Trees are cut down for firewood and for use in building fences, and land is over-grazed. In combination with the prolonged decline in rainfall, these factors decrease vegetation, in turn reducing the soil's water retention capacity.

(3) Amplification of soil erosion and flood damage

Since there is little vegetation, even a little rainfall can cause severe outflows, and there is widespread damage from soil erosion and flooding throughout the target area. Also, as a result of soil erosion and flooding, the topsoil runs off, the moist soil runs off and the soil's water retention capacity is reduced even further. This lowers the land's agricultural productivity.

3.6.4 Constraining factors related to infrastructure

(1) Loss of existing dam's functionality due to sediment

Lepellane Dam, which is located in the central part of the target area (for irrigation purposes, with effective storage capacity of 10 million m^3), is currently almost completely silted up and it has completely lost all functionality as a dam. Small-scale dams to supply drinking water for domestic animals have been built in all around the area, but many no longer function because of sand deposits. The large outflow of sediment in the target area speeds up the process by which sand builds up in existing dams.

3.6.5 Constraining factors related to people and information

(1) Lack of opportunities to use past experience (constraining factors related to administration and residents)

There are few opportunities for activities from past projects and this study's pilot projects as well as their output to be passed on to many people, including the department of agriculture and community residents.

(2) Insufficient personnel (constraining factors related to administration)

There are not enough personnel at the LDA Head Office and the Sekhukhune district office to expand the soil conservation activities and projects through a broad area of the target area.

(3) Residents' lack of environmental awareness (constraining factors related to residents)
Ensuring that they can obtain their daily food is more important to residents than environmental problems. Also, since it takes time and effort before one can see the results of environmental conservation and soil conservation, it is difficult to give residents any incentive.

3.7 Lessons from the Past and Present Soil Conservation Projects

"3.1.4 Soil and soil erosion" provided an overview of soil conservation measures and projects both inside and outside the target area and explained the current status of these measures and projects. The issues and achievements of these soil conservation projects are summarized below. The problems with these soil conservation projects are summarized in the three points below; there is room for improvement in terms of maintenance, input and design. On the other hand, some projects have been successful in restoring vegetation in some extent, and it is therefore important that project activities and components that will generate this kind of good result are integrated in future activities (refer to Table 3-22).

(1) Issues

Inappropriate maintenance that is not sustained

Structures that have been damaged are left as is and neither the administration nor residents make any move to repair the damaged structure, and there is no sustained communication between residents and the administration regarding maintenance after the project is completed. These are just a few of the many examples that call into question the project's sustainability.

Input of large amounts of money and time

As shown in Geen Einde and Sekgopo, when soil erosion is advanced and the dongas are large, the structures to prevent erosion from worsening must also be large, which requires large amounts of money and time until the project is completed. A target site must be chosen correctly to achieve the best conservation results with the optimum input. This means avoiding areas where soil erosion is too advanced and dongas are extremely large, there is a steep incline, or the catchment area is large and a large flow of sediment and flood water can be expected.

Inappropriate design seen in some cases

As seen in Geen Einde, there are cases in which structures such as the wire basket retaining walls built on the donga and planting of vetiver actually cuts off the flow of sediment, which worsened the erosion in the surrounding area. This problem can be resolved by adjusting the design.

(2) Good results

Restoration of vegetation

The fence built in Koringkoppies and the structure built using tires in Geen Einde helped to restore vegetation in the target sites. These successful examples must be incorporated into future soil conservation activities.

Table 5-22 Problems and good output in past and present soil conservation projects

Project / Problems/output	Geen Einde	Koring-koppies	Sekgopo	Makgoba	Boehout-laagte
(1). Problems					
① Inappropriate maintenance that is not sustained	○			○	○
② Input of large amounts of money and time	○		○		
③ Inappropriate design seen in some cases	○				
(2). Good results					
① Restoration of vegetation	○	○			

Chapter4 Rural Society and Gender

4.1 Present Conditions of Rural Society and Gender

4.1.1 General overview of socioeconomic aspect of the target area

Limpopo Province, in the northeast of the Republic of South Africa (RSA), represents 10% of the nation's land area. According to the national census of 2001, Limpopo province's population in 2001 was 5.27 million, or 11.8% of RSA's total. Economic performance is generally low: for example, the province's contribution to RSA's GDP is just 6.7% in 2005 and 63.8% of its people living under the poverty line, much higher than the national ratio of 47.8% (2001). Social indicators are low: adult literacy rate is 77.7% compared to 85.9% for the whole country (1996); the fertility rate is 4.0%, compared with the national 2.9% (1996-2001). Limpopo province is one of the most economically and socially underdeveloped areas in RSA. The target area appears to have the same socio economic problems as Limpopo as a whole. The target area has the characteristics as described in the following sections.

According to the national census of 2001, Fetakgomo has the population of 92,000, and Makhuduthamaga 262,000, respectively.

(1) Black Society

Black Africans are 96.5% for the province and 76.7% nationally. Both Fetakgomo and Makhuduthamaga Local Municipalities, in which the target area is located, have more than 99% of Black Africans, who suffered from discriminatory national policies for a long time until 1994. General tendency that people do not have strong motivation toward self-reliant development has considerable relation with the historical background.

(2) Female Society

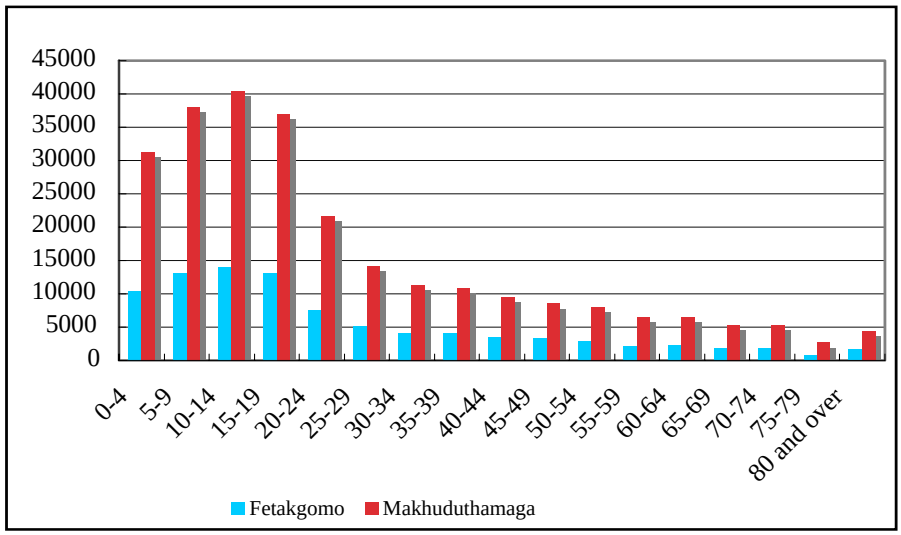
Females make up 52% of the national population. The female proportion in Limpopo province is higher at 54%; and in Fetakgomo, and in Makhuduthamaga, it goes up to 56%. The female proportion of the 574 persons interviewed in the village profile survey carried out for this study in the target area was 55%. Leaders of 40 communities in the target area, in group interviews, put the average proportion of females in the entire population at 67%. This estimate, although in the nature of perception rather than statistics, reflects their being a large majority of females in the target area.

(3) Unemployment

According to the 2001 census, the age distributions in the population of Fetakgomo and

Makhuduthamaga Local Municipalities are exceptionally unbalanced, with many children and less adult males. The population distribution of the two municipalities for 2001 by broad age group is shown in Figure 4-1.

Figure 4-1 Population Distribution by Age Group



Government statistics divide people aged between 15 to 65 into "Those who are employable" and "Those who are not employable"[1], and categorize "Those who are employable" into the employed and the unemployed. According to the 2001 census, unemployment rate of Sekhukhune is worst in the province of 68.3%. The situations in the two local municipalities of the target area are even worse. Only 25.1% of Fetakgomo's population is employed while 56.1% is unemployed. In Makhuduthamaga, 19.9% of the population is employed while 61.7% is unemployed. In short, very few people are employed to earn income. Traditional leaders in 36 of 37 communities in the village profile survey answered that "unemployment" was the most frequent "occupation" in the area.

Table 4-1 District unemployment rates in Limpopo Province

Sekhukhune	68.3
Mopani	42.8
Vhembe	47.5
Eastern	54.6
Waterberg	36.4
Capricorn	44.9

[1] "Those who are not employable" include students, housewives, the disabled, the sick, and those who do not seek employment. (http://www.statssa.gov.za/census2001/digiAtlas/metadata.html)

Followings are other findings of the village profile survey.

(4) Household

In the absence of reliable data, the team has made estimates of the target area population from the 1996 census and the sampling survey conducted in the target area.

Table 4-2 Household and Family

	Fetakgomo	Makhuduthamaga
Total number of household	17,334	49,957
Number of family per household	5.3	5.4
Children (0 –19)	3.2	3.2
Adult (20-59) (female)	1.7 (1.0)	1.7 (1.0)
Old (60-)	0.4	0.4

Household size varies from 1 to 18, with an average of 6.5 and a mode of 7 and an average number of children of 4.6. Elderly (over 60 years), middle aged (from 20 to 60 years) and young (under 20 years) proportions respectively are 6%, 53% and 42%. The sections below describe household economy and income levels.

(5) Food

Maize is the main staple (84% of the people) and sorghum the next (16%). Sorghum is preferred more for cropping because it requires less water than maize. The village profile survey found the self-supply of staples to be low, with 91% of households purchasing "all" staple and 4% "most" staple. However, the respondents may have answered reflecting their more recent experiences, in which low rainfall had prevented them farming.

"Less than once a month" was the most frequent answer on meat consumption (49%), followed by "a couple of times a month" (18%). For fish consumption, "none" accounts for 43% and "less than once a month" for 27%. However, with regard to consumption of poultry, the household expenditure survey conducted three years after the village profiling survey found that 9.4% of the total monthly income of each household is spent on meat (chicken), eggs, and milk. Thus it is reasonable to conclude that the consumption of poultry has increased since the start of the village profile surveys. This 9.4% means SAR 59 per month, and it is worth two chickens. In sum, the latest information indicates that the average household in the target area is a family of 5 to 7 people consuming meat equivalent to 2 chickens a month. In addition, the same

household expenditure survey found that the average household spends 6.3% of its income on vegetables and fruits.

(6) Education

Most adults attended primary school but dropped out before graduation. The average education of children is more than junior secondary graduation. There seems to be no correlation between the educational levels of adults in a household and their income. Social stratification may not have so proceeded and/or their absolute income may be lower than the level in which general correlation between the two appears.

(7) Illiteracy

Illiteracy can be estimated from the proportion with no education which, for adult males, is 47% whose average age is 61 and, for adult females, 50%, whose average age is 54. Literacy of children is apparently greater than 99% as children with no education numbered 1 of 116 males and 1 of 140 females.

(8) Crime

Most communities are annoyed by crimes, of which the village profile found livestock theft the most frequent, at 40%. The second most frequent answer was house-breaking (22%). Rape accounted for 7% of the answers. Some interviewees pointed to unemployment of youth after graduation and serious poverty as causes of crimes.

(9) Domestic Water

The main pipeline, the water source of which is Olifants River, runs beside the main road from Apel to Schoonoord and along the Mohlaletsi River, distributing domestic water to surrounding communities. Several boreholes have been independently constructed, with the assistance of NGOs and the government or by community members themselves, to distribute water for domestic use, livestock and gardening. Distribution pipelines and water taps have been installed inside community areas. However, quite a few of the boreholes are not well maintained and managed. Lack of community capability to maintain the installed facilities has led to many boreholes yielding no water and being now unused. The most frequent answer on the source of domestic water was rivers (47% of respondents), followed by public piped water or communal tap (27%) and boreholes (15%). Individual piped water is very rare. The average time for a water fetcher to reach a river is 40 minutes and the maximum is 2.5 hours. Some boreholes used electric pumps but there are many claims that the pumps had been broken and are not functioning or had been stolen, forcing people to go to a river to fetch water, as they had done in the past.

DWAF is responsible for development of domestic water supply facilities and municipalities and/ or community associations for their maintenance and management. However, water management, including maintenance of facilities and collection of fees, is not necessarily well done by those organizations.

(10) Electricity

The proportion of households with electricity was 64%. The study team observed main electric lines along roads almost everywhere in the target area and further electrification is proceeding. However, people seemed to use electricity mostly for limited basic purposes such as lights and radios, while few households used it for cooking and economic activities.

(11) Energy

The overwhelming domestic energy source for daily cooking is firewood (91% of households), while less than 5% use paraffin. Some respondents commented that paraffin is too expensive for daily use. Meanwhile, some people know that cutting trees is not good for the environment, especially in causing soil erosion. Indeed 78% answered that they were "very" concerned and 16% "some" about soil erosion.

(12) Rural Roads

The main roads north and south from Apel to Schoonoord and east and west from Schoonoord to Jane Furse are paved. Those are used for transportation inside the target area and between the area and outside, connecting to the regional road going from Polokwane to Jane Furse. The pavement work on the roads has made considerable progress in three years during the study period. A prime example of a road paved is the road running in the east-to-west direction from Apel to Apel Cross in the northern part of the target area. In Apel Cross, the road crosses a major road going south from Lebowagkomo to Jane Furse. In addition to major roads such as these, parts of sub-main roads running in the middle of the target area have also been paved. The rest of the roads are unpaved and are not necessarily in good conditions.

(13) Information

More than 60% of the interviewed households have a radio. Average listening time is 5.8 hours a day. TV-holding households are 27% and the average watching time is 3 hours. The high price of sets and the extent of electrification might cause the low TV holding ratio. Radio is the primary media in the target area. Of women's leaders, 52% answered that the information source about HIV/AIDS was radio. The national TV station, SABC, owns a Sotho language radio station named “Tobela FM” and this is the primary information source for the majority of the people. Frequent newspaper readers numbered 30% of all the interviewed households; the low rate may be caused by availability, illiteracy and poverty.

Community Radio Stations

The Department of Communication promotes establishment of "community radio stations" as one of the RSA's communication policies. There are 7 community radio stations in Limpopo Province, one of which is the "Sekhukhune Radio Station," located in the target area near Jane Furse. It was established in 1997 with a mission of "radio station which provides necessary information for good health and rural development in the area." Although it has stopped its operation, one of its most famous programs was the introduction of local entrepreneurship. During the program, local entrepreneurs, self-employed business people and other local people who can be a model of self-development were invited to the studio and introduced their experience such as how they overcame difficulties in starting businesses. There was a huge reaction from listeners to this program. Although there is no official survey record on audience rating, Sekhukhune Radio Station might have more regular audience than Tobela FM.

Multi-purpose Communication Center

The Office of the Premier of Limpopo province has established 10 Multi-Purpose Communication Centers (MPCC） in the province. These centers are equipped with computers which can connect to the internet and communication officers from every government department. These are pilot centers, which will demonstrate "a one-stop station for public service information."

(14) Communication

No phones of any type were available in 10% of communities. Many (70%) of the communities replied that no or very limited ordinary phones were available but that a few people had a cell phone; 20% of communities answered that around half of the residents had cell phones. The team has also confirmed that cellular phones have become quite common in the last three years.

(15) Agriculture

Of 93 interviewed households, 45% answered they do no farming at all. The remainder holds field for farming but irrigation systems are rare and most could not farm this and last year because of drought. When farm normally, sorghum is the most preferred primary crop (59%, multiple answers), followed by maize follows (41%). However, through observation during the study period, the only places where maize cultivation was confirmed to be taking place were just a few locations along Olifants River where the ground water level is high, and Leolo plateau in the south with relatively plentiful rainfall. The most widespread farming method in the target area is mixed farming of sorghum or millet with other crops such as watermelons and beans. Although this method uses the tractor to cultivate soil, it uses neither fertilizer nor pesticide. This farming method may reduce risks of waste investment due to shortage of rain, but the yield per area is lower than that of single-crop farming. With regard to vegetables, some groups with outside assistance cultivate

them as projects, and some individual farmers also grow them. But their work is relatively minor in the target area as a whole.

(16) People's Interests in Development

Respondents were asked to select two interesting areas to improve their lives from: (i) mining, (ii) agriculture, (iii) tourism, (iv) small-scale trading and (v) others. Of 89 interviewees, 47 made agriculture as the first choice (53%) and 16 as their second choice. There were many comments of much interest in agriculture but the lack of water, capital, skills and markets prevent people from starting farming. These constraints make people afraid of taking any risks including challenging new production technologies and introducing new crops. The cultivation methods remain very simple and not intensive. The people sometimes even do not try to farm in irrigation schemes or use boreholes.

Another assessment of information needs in the study found that nearly 90% of respondents indicating they needed more information on agriculture. Given that only about 40% of the respondents answered agriculture as their primary occupation, this figure is higher than might be expected. This assessment also asked which specific items of information were needed. The answers include: vegetable cultivation skill, poultry skill, general information on agriculture, and business management skill for agriculture. Among these items, only vegetable cultivation skill and poultry skill are concrete opinions, while the others are more general statements. This may be caused by that the ordinary people in the target area do not have a clear image of "agriculture" (only 40% of respondents engage in farming).

4.1.2 Current socio economic development issues

(1) Poverty

Many people in the target area are poor, and the levels and structures of poverty need to be examined. The poverty line determined by the national government means a monthly cash income of SAR 353 and an annual cash income of SAR 4,236. Meanwhile, the village profile survey by the study team found that the average annual cash income of interviewed households was SAR 8,111. Average incomes of male-headed households and female-headed households were respectively SAR 8,353 and SAR 7,590. Distribution of several categories of annual household incomes for the whole of Fetakgomo and Makhuduthamaga are shown in Figure 4-2[2].

[2] Data about the target area are from the Village Profile Survey. Data about whole Fetakgomo and Makhuduthamaga income levels are from Municipal Demarcation Board (http://www.demarcation.org.za).

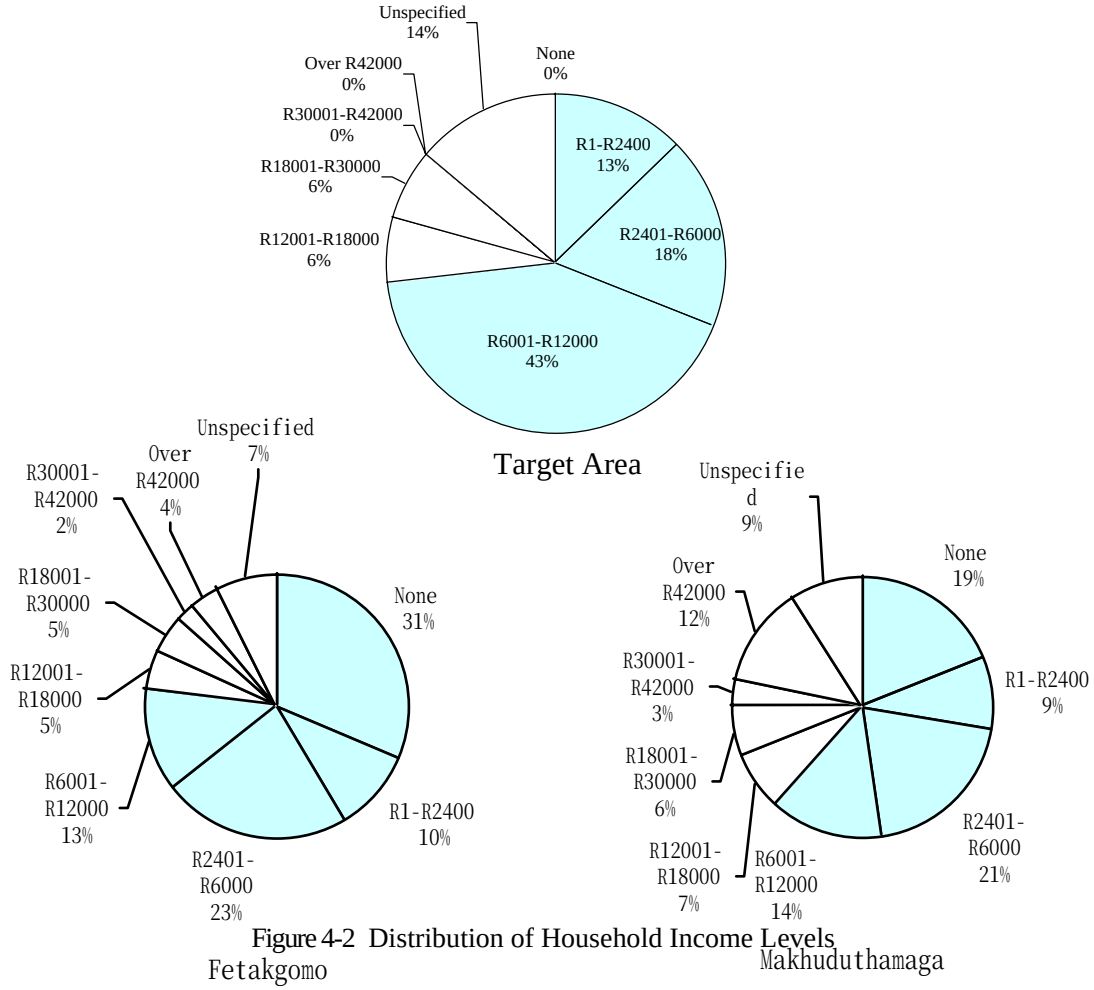


Figure 4-2 Distribution of Household Income Levels

Incomes of households in the target area also vary greatly. For example, female-headed households with ordinary economic activities and female-headed households with a pensioner earn respectively averages of SAR 9,557 and SAR 9,601 per year but the average income of female-headed households without breadwinners is just SAR 3,770.

The staple food is the target area is maize porridge. Staple food prices illustrate the reality of poverty. If a person consumes 0.5 kg of maize meal a day, primarily through maize porridge, he/she needs 183kg per annum. The average household, with 6 members, requires 1,095 kg of maize meal a year. At the standard price of maize meal in the target area, that average household needs at least SAR 3,942 a year just for the maize staple. The average income of female-headed households of SAR 3,770 is even less than that.

Income sources in the target area are in two categories: ordinary economic activities and public grants. Ordinary economic activities include wages and salaries, small-scale trading, occasional jobs such as cleaning of others' houses, baby sitting and house building support, selling of items such as clothes, crop and livestock products and processed foods like marula beer. The old age pension is the largest public grant, followed by the child support grant.

The village profile survey found the shares of cash income to be:

Wage/salaries	38%
Pension	37%
Child support grant	11%
Small-scale trading	6%
Others	8%

The total of wages/salaries earned by all sample households is 38% of total income of all sample households. However, “wages/salaries” includes not only those from employment within the target area but also those from outside. Some breadwinners stay near workplaces in big cities and go back home sometimes. In short, more than half of cash income including pensions, some wages/salaries and child support grant seems to flow from outside the target area. Non-cash income such as self-supplied grains and vegetables and hunted wildlife is added to the cash economy of the area. Mutual-supporting mechanisms such as food donation and celebration food are used to adjust for income gaps among households.

Some people are in extreme poverty. For example, the average income of survey respondents with neither a breadwinner nor a pensioner was SAR 2,993 in male-headed household and SAR 3,770 in female-headed households. Several interviews with those households they showed ways for survival to be:

1) Asking relatives and neighbors for food, mainly maize meal
2) Getting credit from a grocery shop for maize meal
3) Picking up maize rubbish following a harvester in a commercial farm
4) Hunting wild animals and picking wild plants
5) Getting food in celebrations of others.

Asking someone for food, case 1), seems to be widespread. Many who assist poor people are pensioners. Some people rely on remittances from outside.

If poor people cannot afford to pay for food, it is common that grocery shop owners credit them,

case 2). When such people get some income, they pay a little but normally cannot clear all the debt. Shop owners pass on the losses to prices of commodities, resulting in those who can afford goods subsidizing those who can not.

An example of case 3) was a woman in Makhuduthamaga who said that 50 to 150 kg of maize can be picked up on a commercial farm. If she gets 150 kg of maize, it is substantial because this is almost the amount required for one person annually. Although it is not clear how many people are doing this, survey respondents and agricultural extension officers spoke of it as one of the typical “free of charge” survival ways for poor people.

An example of case 4) was a young man in Fetakgomo who explained that he usually hunted 4 hares and 4 to 5 guinea fowls a month. It is unknown that his case is typical or exceptional. Many people pick up Marula fruits. They eat not only the fruit pulp but dry and crush nuts, giving a fat- and protein- rich seasoning for maize porridge.

A woman in Makhuduthamaga was an example of case 5), showing a full pot of beef that she got in a wedding party nearby. She said that she got meat about once a month in others’ celebrations. Though poor people themselves cannot have a big party that costs much, some people with stable income and those from the target area and living outside can have a big celebration in the community.

Figure 4-3 shows flows of resources in/out of communities, estimated from interviews of people in the target area. Implications of the figure are:

- Pensions, some wages/salaries, and remittances are major cash flows from outside.
- There are very few items other than labor to sell out of the target area.
- Pensioners and stable income earners are supporting neighboring poor people. Supporters are physical neighbors as well as families and relatives.
- Goods from nature are limited but seem to contribute to maintain minimum nutritional levels of poor people.

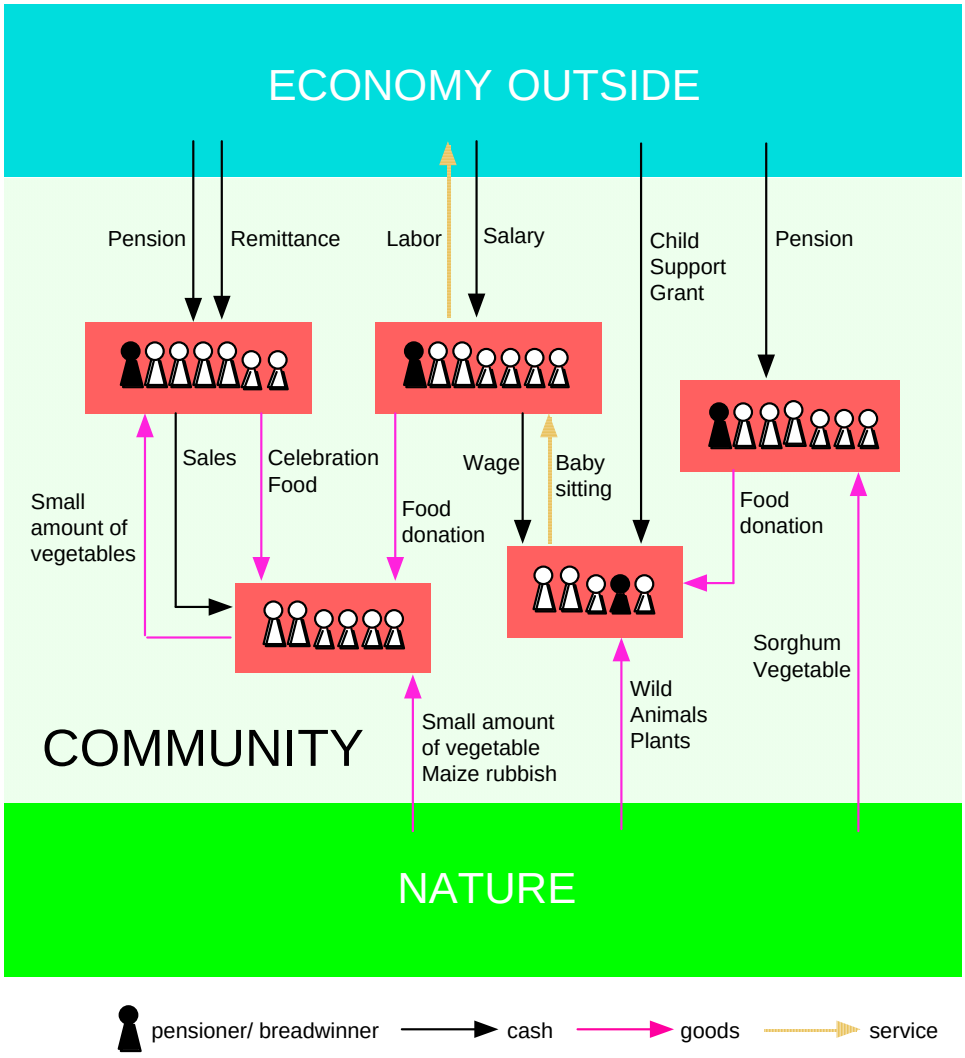


Figure 4-3 Economic Structure Image in the Target Area

The economy of the target area is thus vulnerable and depends heavily on the outside. Major incoming cash is income transfer from outside. The incoming cash seems to, at best, cover the minimum requirement of life for most recipients. Non-cash income helps sustain people but is limited and unstable. People spend their precious little cash income on daily basic goods such as maize meal produced outside the area.

(2) Group management

Many group projects in the target area are reported to have failed. Some NGO staff claimed that people could not work in groups and development projects should be designed to support

individuals. However, it must be asked whether socio economic development through only individual activities is realistic in this area?

The findings of this study dispute the opinions of the NGO staff as people showed that they can manage an organization well under certain conditions. The examples of several existing organizations in the target area give some valuable lessons.

Mogodishano

Mogodishano is an indigenous saving/credit group. Usually, about 10 members get together monthly and collect money SAR 20-200 from each member and all this money is paid to one of the members. The order in which each participant gets money monthly is discussed at the first meeting and listed in writing. No interest is paid and received by any members in Mogodishano. Though it deals with money, which is an extremely serious issue for people and often causes conflict among them, people usually manage a group of this scale with a clear objective on their own successfully. Mogodishano is a small group with a clear shared objective, and a typical successful case of self-help group management by people.

Funeral Society

Almost all people in the target area are members of indigenous funeral societies which have savings funds to be used strictly for funerals. The scale varies from 50 to more than 300 people. Members usually meet once a month and pay SAR 10-150 each. When a funeral of a person who is a family of a member is held, all its cost is paid from the fund. For instance, if a person from Fetakgomo dies in Cape Town, a funeral society member goes to Cape Town to bring the body back to his/her community and all the expenses are paid from the fund. Each society has a constitution and several management positions; funds are kept in bank accounts. The social value of a good funeral in the area's culture is very high and objective and managerial aspects of funeral societies are rather simple and clear. Corruption seems to be controlled primarily by communal and cultural pressures. This is another case of successful management of self-help groups.

Community Water Service Providers

People successfully run community water service providers (CWSP) for domestic water in a number of communities. Although a CWSP usually has to handle more than 300 people, successful organizations are strongly supported through training provided by specialized NGOs and consultants. Similar to the previous case, the basic need for domestic water is obviously very high. CWSP shows that even non-traditional groups can be managed successfully by people, given certain conditions.

Farmer Group

Some farmers' groups are successfully managed and some are not. There are many "failed" cases, in which activities have stopped completely. The number of members of most farmers' groups is 15-50. Successful group management seemed to be attributed to (i) less difficult problems in production and marketing; (ii) continuous technical and institutional support by extension officers and NGOs; and (iii) strong leadership of groups.

Irrigation Schemes

Irrigation schemes typify failure of group management. The steering committee of an irrigation scheme handles more than 300 farmers; this requires substantial organizational management methods and skills. Unfortunately, most irrigation schemes did not get support needed to build those methods and skills. In addition, steering committees often faced very difficult problems such as destruction of facilities by floods. These problems, which are emergency in nature and require a lot of money and complex decision making, seem to have overwhelmed the management capacity.

From these examples, we learn that:

1. If people work in a small group (less than 15 members) and the organizational objective is clear, they can manage without special assistance.

2. If people work in a medium scale group (15-50 members), some groups are managed well and some are not. The causes of the difference could be:
   - **Outside:** When the problems are too difficult and complex for members to solve, a group cannot be run well. Difficulties may lie in the necessity of large funding, marketing and severe natural conditions such as drought.
   - **Inside:** Combination of internal weaknesses such as insufficient management skills and lack of strong leadership as well as lack of external assistance to overcome these weaknesses makes group management very difficult. In general, as almost all groups have certain internal weaknesses, external support for institution strengthening is indispensable.

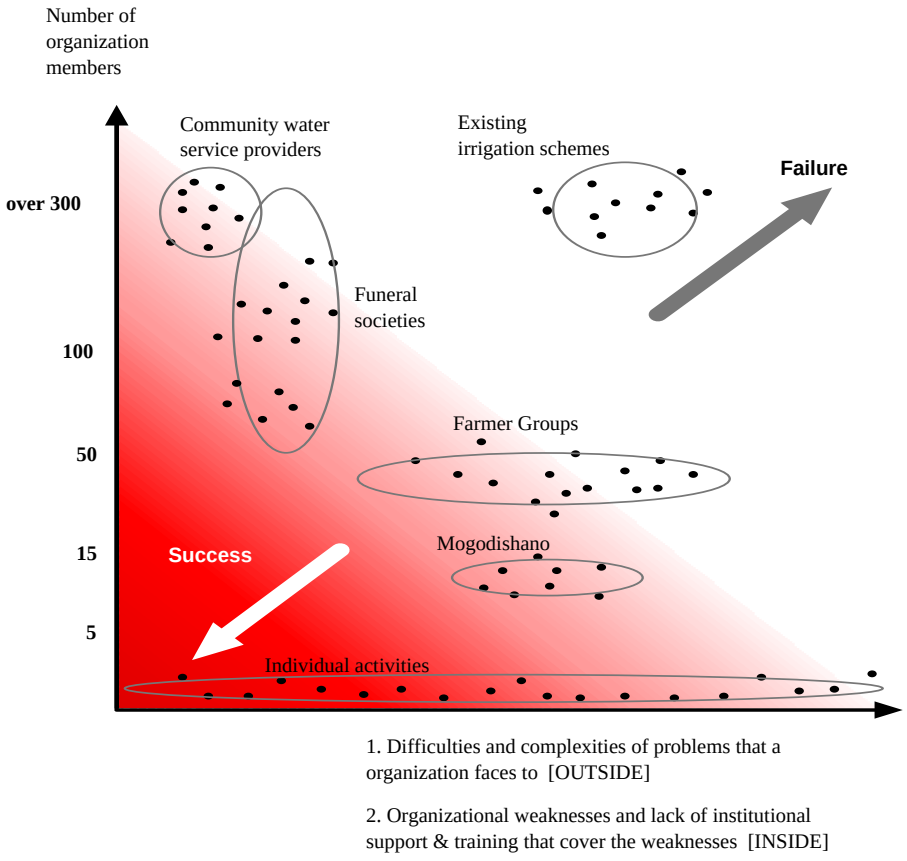
3. If people have to work in a large-scale group (more than 50 members), a group that has high organizational management skill supported by continuous interventions from outside may be able to survive.

Existing irrigation schemes in the province have nearly or more than 300 farmers in each, which automatically means that managing these organizations is by no means easy. In addition, the organizations have to rehabilitate facilities because of flood. Rehabilitation is too hard for these groups as it was not expected to occur in their daily water use activities.

In contrast, some community water service providers, which also cover more than 300 households, are running their organizations well. Normally, NGOs and private consultants support the community water service providers, at least in the initial stage. As most problems including facility maintenance can be foreseen beforehand, supporting experts can advise solutions at the start of the project, such as the community raising an emergency fund.

Figure 4-4 shows the organizational management possibility. There are three parameters. The vertical axis represents the organization's membership. The horizontal axis represents (i) difficulties and complexities of problems that an organization faces; and (ii) organizational weaknesses and lack of institutional support and training that cover the weaknesses. The origin shows the most successful management possibility. The more upper right an organization is located in the figure, the less successful its management could be. For example, if an organization has more than 100 members and faces very difficult problems, the management might be less successful. If there are 30 members in an organization and the internal weaknesses are covered by relevant institutional support by a consultant, the management could be successful.

Figure 4-4 Organizational Management Possibility



(3) Traditional Authority

People in the target area live not only in democratically elected local administrative systems but also in traditional systems. Legally, a ward is the minimum local administrative unit but a village, or a community, is a natural and customary local unit, which primarily belongs to a tribal authority. As the government recognizes the substantial function of traditional authority, it supports tribal offices by contributing minimum funds, such as salaries of secretaries.

Ordinary people who have a problem that requires consultation with community leaders go to a tribal office, rather than a municipal office. Traditional authority, which has been the sole local authority for a long time, knows needs on the ground. Some traditional authorities are eager to plan and implement development projects based on their daily contact with people, but do not have government budget. Traditional authorities who are keen on development are seeking ways such as:

1. Some chiefs try to work with local government on development issues. They have regular meetings with municipal governments. Some persons from royal kraals are working with democratic government, or even become ward councilors, ward committee members or municipal councilors.

2. They raise their own funds for development projects. The council for Sekhukhune King is now planning to develop a fund involving mining companies.

Although some traditional leaders are conservative, many in the target area now tend to become, gradually, part of the democratic governing system, adjusting their traditional values and roles to fit into contemporary trends towards democracy in RSA.

According to some traditional leaders, the bill called "Traditional Leadership and Governance Framework Bill, 2003", which defines their roles legally will be accepted by the majority of traditional authorities, other than those in Kwazulu-Natal. According to this bill, their roles will be limited as supportive of and supplemental to local municipalities and in separately established district traditional houses, similar to national and provincial traditional houses.

Although the official roles of traditional leaders in the democratic political process will be limited in the future, they are still popular among people. At the same time, royal kraals, many of which had economic power in the past, produced highly educated and relatively experienced personnel, some of whom are working with democratically elected governments, from ward to the central government in Pretoria.

(4) Land Tenure

Lands belonged to nobody in traditional African societies; it was communal and traditional local authorities managed its allocation of the use. When a land dispute occurred, resolution came by discussion in the community, with traditional leaders approving the conclusion. Traditional leaders could not defy the conclusions of the community.

The Government of South Africa in 1913 started several residential reserves for black people and prohibited selling, buying and leasing land outside of the reserves. The Government expanded the reserves in 1936, which became the basis of the former homelands. Although the homeland was legally owned by the government, the government entrusted the local traditional authorities for administration of land use in order to incorporate them into the government system.

Though traditional leaders were in charge of the management of communal land for a long time, they were merely trustees holding land on behalf of the people, who were its real owners. In contrast, the Government after 1913 gave substantial power to traditional leaders to make decisions on land issues. As a result, some traditional chiefs virtually owned land, trying to activate exclusive authority. In some land disputes, military force was mobilized to remove land from people in accordance with traditional leaders' requests.

People in ex-homelands occupied and used lands for a long time without any legal recognition. Some got a “Permission To Occupy (PTO)” from the local traditional authority. The PTO was given to an applicant indefinitely and could be inherited over generations. Legally, however, PTO was not a right. Land tenure was always kept unsecured, which led to troubles such as overlapping and competing tenure as well as the absence of protection of the user from removal from their land.

The abolishment of apartheid policies in 1994 and the subsequent reform in RSA have brought much attention to land tenure systems. The Government has prepared many land reform related bills and some of them have already become acts.

The most influential reform to land tenure systems in former homelands is the Communal Land Right Act of 2004, which enabled the government to comply with the constitutional injunction to provide security of tenure to 13 million black people living under customary or communal tenure systems. The Communal Land Right Act starts from legal recognition of land tenure rights held by communities and their members or households or families or individuals on communal land. These systems and rights are to be openly and legally recognized and secured. Second, the Act confers security of tenure to any occupant or user of land. People previously

had no legal protection against removal from their land, even though they had lived on it for a long time. Development projects had been undertaken on land with such a weak tenure right, often leading to problems during and after their implementations.

Based on the Communal Land Right Act, the Department of Land Affairs is currently undertaking land tenure reform in cooperation with the provincial governments. But it will take many administrative procedures until the land tenure issue is finally settled and lands belong to individuals or other entities. Disputes are also expected. Thus it will take much time until the work to settle legal rights on communal lands is completed.

(5) Mining Sector

There are no mines within the target area, but several mines nearby could provide substantial employment for its now jobless. For example, a human resources officer of Lebowa Platinum Mine in Atok in Fetakgomo, one of the biggest mines near the target area, observed that 3,500 people work there. Out of the 3,500, about 1,400 are the mining company's employees and 2,100 are contractors and their employees. Of the 1,400 employees, 30% are skilled labor and the remainder unskilled. The officer estimated that, out of 3,500 workers, those from outside Sekhukhune district comprise 70%. But no accurate data on employees were obtained.

Many people in the target area expect little positive socio-economic impact, especially employment, from the mining sector. A grocery shop owner near a mine, for instance, said that almost nobody from her community is working in that area. She pointed out that the contractors, such as for construction, catering and laundry, usually take their employees from outside. Although people from various area of Sekhukhune District may be working in that mine, the number from the target area is small. Another local woman who is familiar with mining towns said that a mining company sometimes advertises publicly for workers and many local people apply, but they are rarely hired.

Mining companies are under political pressure to employ more people from areas near their sites. For the time being, however, mining towns will remain isolated with little interaction with the local economy. The impact of the mining sector on local society will be small.

4.1.3 Gender Situation Analysis

(1) Gender mainstreaming at provincial and district level

There are both a policy framework and an audit system for gender mainstreaming at the provincial and district level. However, in spite of efforts to institutionalize systems such as gender focal points, gender programs are generally still event-oriented. This section examines gender policy before going into detailed gender analysis in the target area.

Gender Focal Points in LDA

There is one gender focal point (GFP) at provincial level and two gender focal representatives at each district in LDA. GFPs assist the formulation and implementation of action plans for promoting women's empowerment and gender equity in the work of LDA. GFPs also monitor and evaluate the department's projects and programs.

Gender Audit and Monitoring System

The Gender Audit, which was designed in 1998 to examine gender in the context of social transformation, is conducted in ten provincial departments and five national departments. The Audit is undertaken through a questionnaire prepared by OSW to assess the degree of compliance with international commitments such as the Convention on the Elimination of All Forms of Discrimination against Women and the Beijing Platform of Action.

Gender Action Plan in LDA

The activities for gender mainstreaming in LDA are shown in Table 4-3. Training of LDA staff and managerial personnel for gender awareness is the first major activity. Second, strengthening women's economic capacity is to be promoted in linkage with promoting indigenous foods to meet the market standard. The gender programs also focus on youth development in promoting agricultural projects targeted at school leavers and encouraging them to take part in the national competition.

Table 4-3 LDA Gender Action Plan for 2002/2003

Activity	Objective	Time	Budget	Future Plans
Gender Training	-Enhancement of Gender Awareness	April-November 2002	-Province -Donors	・Training of staff by the GFP ・Training of managers by gender consultant
Promoting Indigenous Food	-Strengthening Women's Economic Capacity -Facilitating Women's Equal Resources	April-November 2002	-Province	・Training of SMME's ・Promoting indigenous food to meet the market standard ・Building of market stalls
Promoting Women in Agriculture	-Farmers Day -Women's Day -Female Farmer Competition	May-October 2002	-Province -National Sponsors	・Job creation ・Poverty alleviation

Source: LDA Gender Focal Point, February 2003

Gender Mainstreaming and Traditional Authority

For uplifting gender awareness of rural women, regional workshops called "Women in

Agriculture Regional Workshop and Provincial Conference" were held, with the involvement of traditional authority, in 1998. The traditional leaders, traditional local councils and male members of the communities were also invited, along with representatives from concerned government departments. The purpose of the workshop was to identify issues and problems in the field of women in agriculture and to strengthen the image of women as key role players for food security.

(2) Gender Analysis in the Target Area

General Situation of Men and Women

The situations of men and women in the target area are closely related to their economic conditions and social welfare programs. The household economies in rural communities rely more on pensions and other support grants as income sources than on wages and salaries, as unemployment rates are high throughout the generations and alternative incomes sources are not stable. Men have to migrate to urban cities to look for a job. On the other hand, men staying behind in rural areas can hardly find jobs and tend to lose their role as the economically active and socially positive partner within the family. Women, remaining in the rural area, often engage in subsistence farming.

1. Female-Headed Households

Female-headed households account for about 80% of the total in the target area. During Apartheid period, the women's social status has substantially fallen with limited access to lands, and the Acts and Customary Law has compelled. Due to economic difficulties, female–headed households and older households were considered as the poorest of the poor in the late 1990s. Now, financial support for the elder, the handicapped and female-headed households is secured by the social welfare system. Unmarried women are given land and are able to get title of usage in their own names. Females heading households are permitted to occupy and use land. As heads of households, they can attend community meetings along with men.

2. Family Entity

It is difficult for men to identity their role in female-headed households. Even where they head households, some men are unable to provide for the welfare of his family. Some men choose to spend their life without marriage, partly because men to have to pay customary "Lobora (betrothal gift)" to their brides' families at marriage. Due to the obligation to pay "Lobora," it is difficult for men who don't earn much to get married. High male unemployment has another impact on the household. Many women have to manage heavy daily work to sustain livelihood without help from their partner.

3. Gender Preference

Even though men's role as breadwinner is weak, males are still favored over females, according to interviews by the study team. Thus baby boys are preferred to baby girls when it comes to newborns. Customary inheritance still remains in the rural areas and men are regarded as the representative of households and successors of inheritance in traditional and customary culture and society.

4. Men and Youth Issues

With the high rate of unemployment affecting them especially, young men do not fully use their energy in positive directions. They hardly participate in farm activities and have little, if any, role in community development because decision-making authority depends on seniority. Development programs by the government and NGOs have few components to foster young entrepreneurs.

Gender Roles

Table 4-4 shows the gender activity profile in Sekhukhune district, from information obtained by interviews of this study. Gender roles vary from household to household, largely according to the families' occupation and income structures.

1. Productive Activities

According to the LDA Sekhukhune district office, there is no female commercial farmer in Fetakgomo Municipality; in Makhuduthamaga, there are four, one of whom was a winner of the national "female-of-the-year" prize in 1999. She produced baby tomato, sugar snaps and other products on 5 ha, for export to France. Some of the commercial farmers on dry land are growing sorghum under contract to a brewing firm. Workers on commercial farms are generally men. Most of the women work at small scale farms, both individual and communal. Incomes are limited and farming is basically aimed for their own household's consumption.

2. Reproductive Activities

Household activities are done mostly by women. Interviews revealed that women have to walk as long as one day to collect firewood. Fetching water is another hard job for women. Most women in their 20s and 30s are very busy taking care of babies and infants.

Table 4-4 Gender Activity Profile[3] in Sekhukhune District

Sekhukhune District, Limpopo Province

	Activities	Women	Men		Activities	Women	Men
	Ⅰ PLANTATION				Ⅲ FISHING		
1	Preparation of Tools	−	+*	1	Fish Breeding	−	+
2	Selection of Seed	+	−	2	Catching Fish	−	+
3	Ploughing	+	++	3	Selling Fish	+	+
4	Harrowing	+	−				
5	Sowing	+	−		Ⅳ LABOUR WORK		
6	Uprooting Seedling	++	+				
7	Transplanting	++	+	1	Migration	−	+
8	Weeding	++	+	2	Carpenter	−	+
9	Harvesting	++	+	3	Mason	+	++
10	Threshing by Hand	+	++	4	Mining Labor	−	+
11	Transporting to Storage	++	+				
12	Selling	++	+		Ⅴ OTHER INCOME GENERATING		
	Ⅱ LIVESTOCK						
				1	Selling Firewood	−	+
1	Cattle/Buffaloes	+	++	2	Collecting Marula	+	−
2	Release/Get Back Home	+	++	3	Making Marula Beer	+	−
3	Feeding Pigs	++	+	4	Making Bread	++	+
4	Feeding Poultry	+	+				
5	Watching Goats	+	++				
	Ⅵ COMMUNITY GARDEN				Ⅶ HOUSEHOLD WORKS		
				1	Cutting Tree for Fire Wood	+	−
1	Land Preparation	++	+	2	Going to Collect Fire Wood	+	−
2	Ploughing or Digging	++	+	3	Fetching Water	+	−
3	Fencing	++	+	4	Cleaning House	+	−
4	Planting	++	+	5	Making Order	+	−
5	Watering	++	+	6	Cooking	+	−
6	Weeding /Taking Care	++	+	7	Carrying Food to the Field	+	−
7	Harvesting	++	+	8	Washing Clothes	+	−
8	Selling	++	+	9	Taking Care of Children	+	−
	Ⅷ TRANSPORTATION				Ⅸ HANDICRAFTS		
1	Driving Tractor	−	+	1	Carving Wood	−	+
2	Driving Minibus	+	++	2	Making Beads	+	−
3	Collecting Fees	−	+	3	Sewing	+	−
				4	Making Pottery	+	−
				5	Making Zink Container	−	+

Note:*+indicates actual involvement, ++indicates the extent of involvement in labor larger than the extent of involvement of +. −indicates no involvement

[3] These roles are changeable according to the situation and needs.

Access and Control to Resources

1. Land

The RSA government tried to change women's subordinate position under customary law. The land reform program has promoted women's registration. Although women's access to land is now legal, it is actually limited by lack of funds, low purchasing power, and customary male line inheritance. However, females heading households have more control of their land than males heading households.

2. Credit and Finance

Females in the male-headed households are required by commercial banks to provide their certificate of marriage and agreement of their husband. Females heading households have more direct access to credit.

3. Decision Making

Since women in their 20s and 30s normally take care of their children at home, those in their 40s and 50s have more free time to attend village meeting and participate in community development activities. The male has more decision-making opportunities than the female, even though females work in agriculture and in household chores. However, in making decisions, women are openly involved in discussions and even make arguments.

Factors Influencing Gender Situation

1. Social Welfare Policy

The social welfare has both negative and positive impacts on gender. The child support grant gives SAR 190 per month for children up to 14 years of age and without a father. Elderly people (women from 60 years, men from 65 years) get old age pension of SAR 820 per month per person. The social welfare helps ease economic difficulties, but also results in deepening psychological dependency on government aid.

2. Tradition and Social Transformation

The "new generation" chiefs are highly educated and well understand the new philosophy of development. They are commonly married to professional women as one form of social status. About one third of chiefs in Fetakgomo and Makhuduthamaga are female. The traditional customs persist, and male-oriented ways of thinking and tribal customs remain among older chiefs and their patrilineal system. However, social transformation and new development concepts have already begun to generate opportunities for gender equity.

(3) Women's Community Group Activities and Their Potential

The community profile survey found that in more than a half of the communities surveyed, women's groups participate in activities for income generation in the target area. They include bakeries, poultry (broiler and layer), vegetable farming, brick-making, fence-making, sewing, mat-making, and pottery-making. The survey found that 58% of these projects were unsuccessful due to insufficient funds and lack of skills and knowledge. Sewing projects using electrical sewing machines faced slow electrification to the area and had to depend on generators. Vegetable garden projects for income generation have various difficulties such as lack of means of transportation for products, low selling price and large start-up costs.

Table 4-5 Women's Group Activity for Income Generation in the Target Area

	Number	%
Is there any women's group activity for income generation ?		
(1) Yes	24	53.3
(2) No	20	44.4
(na)	(1)	(0.02)
Total	45	100

Source: JICA Subcontracted Community Profile Survey in February 2003
Questioner for women ver.5
Note: *Fetakgomo and Makhuduthamaga Municipalities

(4) Health and HIV/AIDS

Health Status

Although it is difficult to get accurate indicators due to the underdeveloped health information system in the district, the major diseases are diarrhea, colds, coughing and pneumonia. The medical officer of the Nchabeleng clinic said that tuberculosis is fairly common and typhoid sometimes occurs. Some people have parasite infestation and worms. Serious non-communicable diseases among adults are common. They include hypertension and diabetes mainly due to unbalanced diets. The tuberculosis rate in Limpopo province is reported as high compared to other provinces.

Primary Health Care

Makhuduthamaga has 17 satellite clinics and Fetakgomo 11, and each clinic covers five to six communities. Mobile clinics provide primary health care for remote communities. Satellite clinics are normally staffed with a professional nurse and midwife and provide ante-natal care, vaccinations and treatment of common minor diseases. The October Household Survey (OHS) in 1999 found that 89% of infants under 24 months have "Road to Health Cards" which is used by the health system to check inoculations and other health details. The survey also found that

8% of the black population has access to medical aid benefits, in contrast to 67% of the white population.

Table 4-6 Comparisons of Health Indicators at Provincial Level

	Life Expectancy at Birth	Crude Death Rate	Total Fertility Rate	Ante-natal Attendance by Pregnant Women	Under 5 Mortality Rate
Unit	Age	1)	2)	%	3)
Year	1996	2000	2000	2000	2000
Ref*	S-2	S-1	S-1	S-1	S-1
Limpopo	57.9	12.5	3.9	84.4	52.3
Mpumalanga	-	11.8	3.1	60.5	63.7
KwaZulu Natal	-	10.7	2.4	66.1	74.5
Gauteng	-	9.8	2.3	50.1	45.3
National Average	58.8	11.7	2.9	65.5	59.4

Source: Ref S-1 Demographic Indicators for 2000, DHW
S-2 ABSA, BMA

1) Number of deaths /1000 people
2) Number of children a woman has by the end of her reproductive years
3) Per 1000 live births

The average age range of women bearing their first child is 16-20 years. The estimated total fertility rate in the project area is higher than the provincial average of 3.9. Interviews with women in the target area showed that the welfare program gives an incentive to women to have more children, even though mobile clinics and satellite clinics recommend family planning and birth spacing.

Food Intake and Nutrition

The stunting rate, an indicator of chronic malnutrition, is slightly higher in Limpopo province than the national average. The target area has very high levels of Vitamin A deficiency, placing people at risk of visual defects and complications and forms of infection. Iron deficiency is fairly common, although preventable by taking vegetables and other foods with high iron content. Iodine deficiency also prevails in the province.

Table 4-7 Comparison of Nutrition Intake at Provincial Level

	Stunting[1)] Rate	Vitamin A Deficiency	Iodine Deficiency	Iron[2)] Deficiency
Unit	%	%	%	%
Year	2000	2000	2000	2000
Ref*	S-1, S-2	S-1, S-2	S-1, S-2	S-1, S-2
Limpopo	23.1	43.5	25.0	11.0
Mpumalanga	26.4	33.0	41.7	11.5
KwaZulu Natal	18.5	38.0	4.2	13.4
Gauteng	20.4	23.5	6.3	9.2
National Average	21.6	33.3	10.6	9.8

Source: Ref S-1 Demographic Indicators for 2000, DHW
S-2: Malnutrition in Limpopo, Dr. DL Department of Community Health

Note: 1) % of children between the ages of 1 to 9 with stunting. The definition by DHW is a state of curtailed growth or development of a person to potential as a result of lack of nutrients form food intake to meet his/her nutritional status.
2) % <12mictogr/dl

Table 4-8 shows consumption of meat and fish in the target communities, as found by the community profile survey. A community meeting in Fetakgomo revealed that the people hunt hare, wild birds and other wildlife for their food.

Table 4-8 Frequency of Intake of Meet and Fish in the Target Area*

	Meat1)		Fish	
How many times do you eat meat/fish ?	(n)	(%)	(n)	(%)
(1) More than a couple of times a week	4	8.0	2	4.5
(2) Once a week	3	6.0	3	6.8
(3) A couple of times a month	10	20.0	12	27.2
(4) Less than once a month	25	50.0	20	45.5
(5) None	8	16.0	17	38.6
Total	50	-	44	-

Source: JICA Subcontracted Community Profile Survey in February 2003
Questioner for Sampled Household ver.5
Note: *Fetakgomo and Makhuduthamaga Municipalities
1) The meat in this table means chicken.

HIV Prevalence

The national HIV incidence is 11.4%, according to the Nelson Mandela/HSRS Study of HIV/AIDS in 2002. The Limpopo Province HIV prevalence rate is 9.8%.[4] The HIV positive

[4] Nelson Mandela/HSRS Study of HIV/AIDS, South African Natural HIV Prevalence Behavioral Risks and Mass Media, Household Survey, December 2002 by Nelson Mandela Foundation

rate among black population is 12.8% (Table 4-9), higher than the other racial groups. There are differences among age groups; pregnant women aged 25-29 show 38.6% (Table 4-10), the highest rate.

There are people living with HIV/AIDS in the target area. Hospitals and clinics offer voluntary HIV tests and communities are supplied with preventive goods. The Department of Health and Social Development takes initiative on traditional leaders' participation in anti-HIV/AIDS campaigns to uplift awareness and knowledge.

Table 4-9 HIV Prevalence among by Race in 2002 (National Prevalence)

Race	HIV Positive (%)
African	12.8
White	6.2
Colored	6.1
Indian	1.6
Total	11.4

Source: Nelson Mandela/HSRS Study of HIV/AIDS, South African Natural HIV Prevalence Behavioral Risks and Mass Media, Household Survey, December 2002 by Nelson Mandela Foundation

Table 4-10 HIV Prevalence Rate amongst Pregnant Women by Age Group in 2001

(National Prevalence)

Age Group	Overall Women (15-49) %	African Women (15-49) %
15-19	7.3	7.5
20-24	17.1	19.1
25-29	32.0	38.6
30-34	24.1	29.7
35-39	13.8	17.5
40-44	19.0	22.5
45-49	11.2	11.3
Total	17.7	20.7

Source: Survey completed with pregnant women Department of Health in 2001

The community profile survey found that half the women are aware of HIV/AIDS. The knowledge of community members about HIV/AIDS varies from generation to generation and younger people know better than elder people. A health officer reported that there are many funerals in villages because of an epidemic. However, there is no checking and reporting system of causes of death in the target area, thus no way of finding out exactly how many people have died of HIV/AIDS.

Table 4-11 Knowledge on HIV/AIDS in the Target Area*

	n	%
Do you know anything about AIDS?		
(1) Much	22	51.1
(2)Some	9	20.9
(3)Little	7	0.16
(4)None	5	0.11
Total	43	-

Source: JICA Subcontracted Community Profile Survey in February 2003
Questioner for women ver.5
Note: *Fetakgomo and Makhuduthamaga Municipalities

(5) Education

School Enrolment and Dropout by Gender

School enrolment rates until the sixth grade are slightly higher for males than for females. However, the secondary and tertiary education levels are slightly higher for females than for males. More males than females drop out in the lower grades. However, the teenage pregnancy and the need for household labor tend to cause more females to drop out after the ninth grade.

Table 4-12 Number of School Enrolment by Gender in Limpopo Province in 2002

	Female	Male	Gender Ratio*
Grade 1	74,176	78,411	0.946
Grade 2	67,921	71,465	0.947
Grade 3	63,834	73,643	0.867
Grade 4	77,504	86,306	0.898
Grade 5	83,281	89,989	0.925
Grade 6	75,106	76,258	0.985
Grade 7	69,425	69,021	1.003
Grade 8	74,454	72,333	1.029
Grade 9	101,442	97,478	1.040
Grade 10	68,216	58,821	1.159
Grade 11	59,625	48,820	1.221
Grade 12	39,440	33,647	1.172

Source: Provincial Department of Education, Attendance Statistics, MIS, 2003
* Gender ratio here indicates number of females per male.

Table 4-13 Number of Repeaters by Gender in Limpopo Province in 2002

	Female	Male	Gender Ratio*
Grade 1	3,017	4,579	0.658
Grade 2	2,644	4,114	0.642
Grade 3	5,852	10,121	0.578
Grade 4	7,373	12,156	0.606
Grade 5	7,627	12,123	0.629
Grade 6	5,794	7,604	0.762
Grade 7	3,170	3,907	0.811
Grade 8	8,319	8,969	0.927
Grade 9	21,680	20,694	1.047
Grade 10	20,675	17,953	1.152
Grade 11	20,936	16,508	1.252
Grade 12	11,479	8,158	1.407

Source: Provincial Department of Education, Attendance Statistics, MIS, 2003

* Gender ratio here indicates number of females per male.

Family Background of Children

A female primary school teacher in the target area described that female-headed households are sometimes found to be economically and socially better off than male-headed households. Male-headed households frequently suffer from the husband's delinquency, such as alcoholic habits and mental depression caused mostly by unemployment. Table 4-14 shows that half of black children live with only their mother, compared to only 7% of white children.

Table 4-14 Children* in Relationship to Parents (Unit: %)

Living with	African	White
Both parents	40	89
Father only	2	0
Mother only	46	7
Neither	13	4

*Under the age of 7

Source: October Household Survey in 1995

(6) Youth

There are many youths, but many of them are unemployed. They also tend not to take part in opportunities for dialogues with community inhabitants: many participants in such events are older people. In communities, it is very rare to see youths take initiative and help others as well as themselves. Young women tend to have their first child early in their lives and their motivation for further education and skill acquirement is low because they have no idea what kind of labor and skills they need. Table 4-15 shows the labor market status and income levels for those aged 15-35.

Table 4-15 Labor Market Status of Those Aged 15-35 by Province

	Total Population aged 15-35 Years	Economically Active			Non Economic Active Population	Labor Force Participation Rate	Labor Absorption Rate	Unemployment Rate
		Employed	Unemployed	Total				
Unit	Number a)	Number b)	Number c)	Number d)	Number e)	% f)	% g)	% h)
Year	1996	1996	1996	1996		1996	1996	1996
Limpopo	1,680,223	269,345	309,119	578,464	1,101,759	34.4	16.0	53.4
Mpumalanga	1,050,909	302,537	203,640	506,177	54,732	48.2	28.8	40.2
KwaZulu Natal	3,112,089	800,129	711,073	1,511,202	1,600,877	48.6	25.7	47.1
Gauteng	3,037,433	1275,633	692,656	1968,289	1,069,144	64.8	42.0	35.2
N. Average	-	-	-	-	-	51.2	30.2	40.9

Source: The Youth of South Africa, Selected Finings from Census 1996

Note:

1) f) Labor force participation rate is the sum of those who are number of employed people b) and unemployed c)expresses as a %age of the total population under a)
2) The unemployment rate h) is the number of people who are unemployed c) expressed as a %age of the total economically active

Table 4-16 Monthly Income of Youth* by Race and Sex

	African		White	
	Male	Female	Male	Female
More than R3501	5.4	6.3	50.8	30.1
R1501 – R3500	17.6	10.0	29.4	42.5
R1001- R1500	21.9	11.1	8.8	11.6
R 501-R1000	25.0	19.5	5.1	7.3
R0-R500	30.2	51.1	5.9	8.6

Source: The Youth of South Africa, 2001, Selected Findings from Census 1996

*Those aged 15-35

(7) Issues in the Gender Sector

Vicious Cycle on Gender, Population and Limited Cash Income

A vicious cycle of population and poverty occurs in the target area. Households in need of cash tend to have more children, in expectation of receiving the child support grant. Thus the number of children is higher among low income households. Meanwhile, households which count mainly on pensions face serious shortage of income if the pensioners pass away.

Since income from agriculture is declining, each household needs additional income sources to secure a stable livelihood.

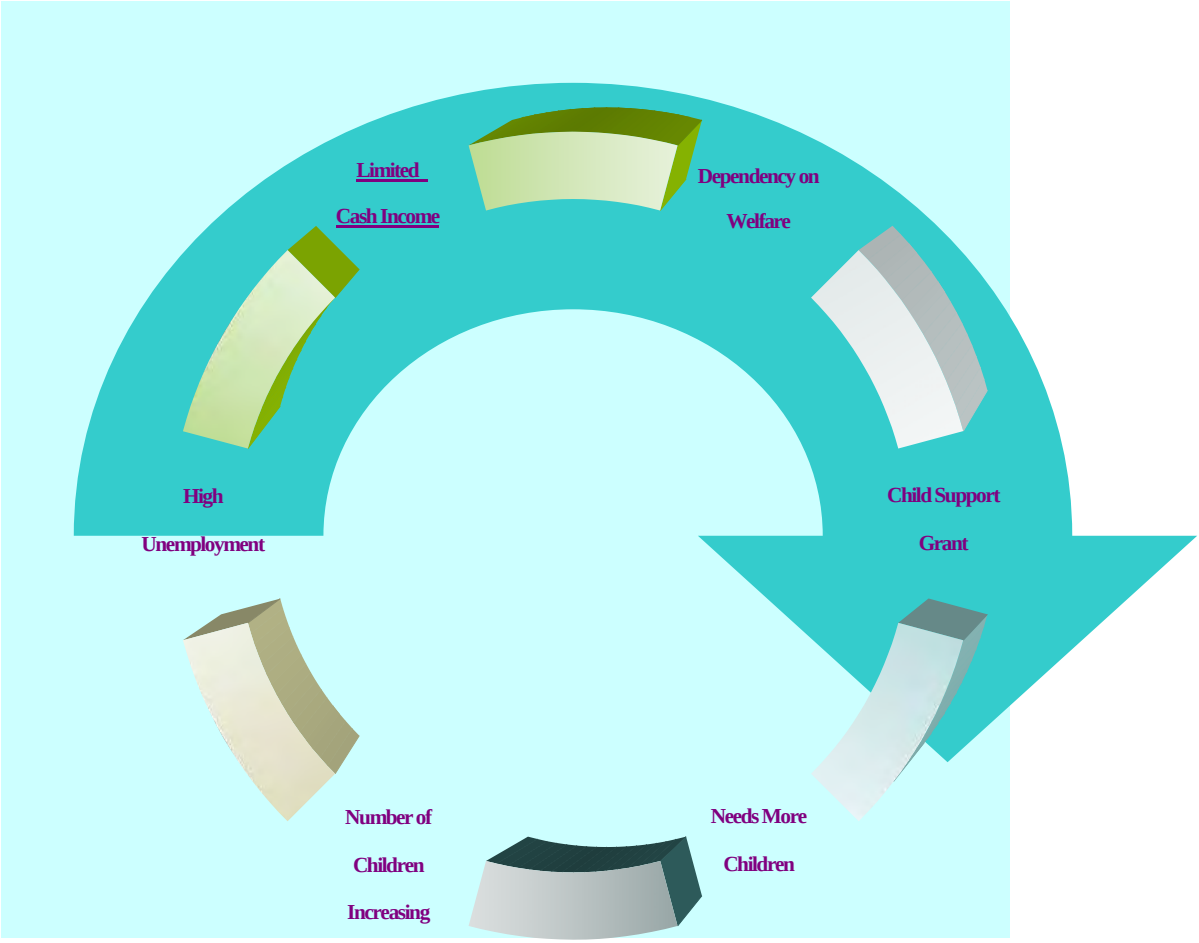


Figure 4-5 Diagram of Vicious Cycle Related with Gender, Population and Limited Income

Basic mindset

People in the target area are likely to think that they have no chance to get cash income without external help. That they had witnessed very few successful development cases so far has underlined this mentality and has considerably constrained their potential. The extreme gaps between the haves and the have-nots in ex-homeland areas necessitate that the people reverse their thinking and they have to be encouraged by successful development achieved by black neighbors.

Another issue is the tendency that people feel that if they had larger assistance, they could solve their problems. Without proper understanding that large investment requires a high maintenance cost, they tend to request the mechanized production line similar to that of large-scale producers. Therefore the creative and inventive ideas supported by realistic market needs are necessary to

start viable businesses in the target area.

1) Marketing for Rural Women

Although they consume basic commodities such as staple food, agro-processing products that come from outside and are sold at pension provision points or from hawkers nearby, the people hardly think that they are able to produce these products and the local market is the most realistic market for them. The people should be persuaded to change such views. They should be strongly encouraged to think that they can produce at least a large part of products that they consume daily.

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Chapter5 Livestock and Forestry

5.1 Livestock Sector

5.1.1 Present Conditions in Limpopo Province and Sekhukhune District

The livestock sector makes a significant contribution to Limpopo Province's economy through livestock products, employment and exports. The Limpopo Province generates 3-4% of South Africa's economic output and is home to about 12% of its total, which implies:

- one of the lowest disposable income and expenditure per person of all provinces;
- a relatively large rural and informal trade sector;
- considerable food production for own consumption in the case of people residing on farms and in informal settlements.

The gross value of production from agriculture in Limpopo Province is about SAR 4 billion, of which livestock accounts for 51%. Most output from livestock includes beef, poultry, eggs, pigs, fresh milk and dairy products, of which slaughtered beef has the largest share (55%) followed by poultry, fresh milk and dairy products. Expenditure in agriculture is SAR 2.6 billion of which 47% is stock and poultry feed. Most, over 90%, of this livestock activity is in the commercial livestock sector. However, over 60% of the cattle and 95% of the goat populations are in the communal areas, which represent an opportunity to make a significant contribution to incomes, food security and employment.

Table 5-1 Livestock Numbers Commercial and Communal Ownership 1993 and 2001 and 2005 in Limpopo Province (,000's)

	Commercial Ownership			**Communal Ownership**			**Total**		
Livestock Type	**1993**	**2001**	**2005**	**1993**	**2001**	**2005**	**1993**	**2001**	**2005**
Cattle	665	450	358	803	725	726	1,468	1,175	1,084
Sheep	121	70	53	87	86	63	208	156	116
Goats	52	32	22	757	661	504	809	693	526
Total	838	552	433	1,637	1,472	1,293	2,485	2,024	1,726
Total LSU	694	467	370	944	849	809	1,568	1,316	1,080

Note: Livestock figures from different sources vary greatly. These figures are based on provincial data collected by LPDA Veterinary Services and Livestock Production. While the absolute figures are different, the trends indicated by the figures from different sources within LDPA, are the same

(1) Livestock Populations

The province has 8.5%, 16% and 11% of the cattle, goats and pig populations of the Republic of South Africa (RSA) respectively. Livestock populations continue to decline in the Province particularly in the commercial sector (defined as livestock enterprises conducted on privately owned land and offtake sold through formal markets). One of the major reasons proposed for the decline in commercial livestock numbers was the conversion of many commercial cattle properties to game parks.

The livestock of Sekhukhune district are significant, representing 11%, 23% and 22% respectively of the Province's cattle, sheep and goat populations. Within the target area, estimates from available livestock data suggest that there are about 24,000 cattle, 5,500 sheep, and 33,000 goats in Sekhukhune.

(2) Grazing Animals

About 5,000 of the estimated 40,000 households in the target area own grazing livestock (Table 5-2). Another 10,000 households may own poultry. The average ownership of those households with livestock is 6 cattle, 1 sheep and 8 goats. There are possibly more than 200 owners of more than 50 head of cattle. In some communities, ownership of donkeys is significant, while that of pigs is insignificant.

Table 5-2 Livestock Populations and Ownership in the Target Area

Target area	Livestock Owners		Population					
	Cattle	Small Stock	Cattle	Sheep	Goats	Equines	Pigs	Poultry
Fetakgomo	542	1,378	8,454	3,921	17,534	839	456	5,277
Makhuduthamaga	1,845	1,775	15,336	1,760	15,523	1,251	873	13,870
Total	2,387	3,153	23,790	5,681	33,057	2,090	1,329	19,147
Average ownership of Livestock (Head/household)			**5.0**	**1.2**	**7.0**	**0.4**	**0.3**	**4.0**

Ownership of animals is normally attributed to men who have traditionally been responsible for managing their grazing. However, with more than 80% of the households reported to be headed by women and more than 60% of all households headed by single mothers, an increasing number of women are expected to own grazing livestock.

For planning purposes, distinction is made between commercial livestock producers and

subsistence or communal livestock owners. The demarcation between these two categories is determined by the type of tenure of the grazing resource. In between commercial and communal ownership, a third transitional category of livestock ownership is becoming evident - emerging livestock producers. There are no commercial livestock producers and no recognized emerging farmers in the target area. Some owners of larger numbers of livestock could be potential emerging livestock producers and have the capacity to participate in some of the programmes being promoted for this group of livestock owners. The number of livestock owners who do not live in the village where their livestock are kept, is significant. Many of the owners of the larger cattle herds work and/or reside outside the village. These owners hire and pay other village members to care for their animals. The level of owner absenteeism is an important consideration for any proposed programmes to address the improvement of rangeland management.

Livestock owners keep grazing animals for a range of reasons including capital and savings, home consumption, draught, manure and for slaughter for ceremonial purposes. Cattle ownership is regarded as particularly prestigious. Status within a community has traditionally been judged by the level of cattle ownership, with the traditional leaders most likely to have the most numbers of cattle. Cattle have also been an important part in family weddings. Traditionally, a young man has to gift cattle to the father of his bride. Although many traditions of the target area communities are changing due to increased education, mobility and decreased dependence on agriculture, those with larger numbers of animals still command status, particularly among the elder people.

(3) Poultry

Ownership of indigenous village poultry, which scavenge for most of their feed requirements, has been a long tradition in the target area. Poultry production has been the major focus for government funded health and welfare support programmes in Sekhukhune district. Government sponsored programs have introduced more commercial poultry production to selected households and community groups. These programmes have promoted small scale household egg and broiler poultry production units based on commercial “breeds” of poultry. However, substantial number of beneficiaries of this programme could not continue the production after they finished initial inputs such as artificial feed provided by the government. Due to this difficulty, LDA decided to terminate this programme in 2006.

(4) Reasons for Keeping Livestock

Households in rural areas are purchasing food and meat from commercial outlets, rather that slaughter of animals for own consumption. Livestock is considered generally as an alternative

means of saving. Cattle are usually considered as a long term capital investment, with goats and sheep being a medium term investment and considered to be a more liquid asset. Poultry are the most likely livestock to be sold first in time of need and the most likely to be consumed within the household at special times such as when unexpected visitors arrive. Subsequently, few cattle are sold for cash or bartered for other goods. Very few cattle are sold at auctions. Sheep, goats and poultry are much more likely to be sold for cash or bartered for other household requirements.

Limpopo Province is fortunate to have a variety of genetically diverse indigenous breeds of farm animal that have adapted to the local environment and human needs. Breeding programs have produced animals which are highly productive under local conditions. These breeds are suited to the extensive grazing areas which are subject to periodic drought, nutritional shortages in the natural veldt and a variety of external and internal parasites and stock diseases. The natural resistance of indigenous cattle to diseases, particularly to tick and tick borne diseases means less expenditure on health treatments. The lower cost of production and the high adaptability of the indigenous breeds are now being recognized by the commercial farming sector in RSA. This interest has resulted in a high demand, and price, for Nguni cattle from the commercial livestock producers. South African breeds of cattle, sheep and goats are in demand from livestock producers in other tropical and subtropical countries due to their adaptability and high production characteristics in arid and semi arid conditions.

5.1.2 Current Development Issues in the Livestock Sector in the Target Area

From discussions with members of livestock owners groups at initial stage of this study, owners of grazing animals identify theft, low prices, deterioration and low productivity of the rangeland, high mortality of animals and their capacity to look after animals on the rangeland as the most significant issues which they would like to be addressed through any intervention in the ruminant livestock sector in the target area. With more intensive problem analyses, livestock owners have more specifically identified lack of grazing, drinking water and quality bulls as the primary constraints to improving the benefits that they can derive from cattle ownership. Interestingly, livestock owners, because of the cattle centric culture, are less able to articulate the constraints to increasing the productivity of their sheep and goat flocks.

(1) Decline of Traditional Management

The traditional village chiefs in the past controlled the use of grazing and water resources in their villages. Many of the village areas were fenced to form “livestock camps.” All the rangeland was communally owned and the chief was regarded as its custodian. With the

breakdown of traditional structures, however, the influence of the chief in deciding who or how the rangeland is used is declining.

The breakdown of traditional patterns of control of land has made the resources more public and open access, and consequently, overgrazing and erosion of rangeland have resulted in a decline in livestock ownership, numbers and production. Mortality rates have increased. Although numbers, especially of goats and sheep, fluctuate with seasons and seasonal conditions, with small grazing livestock numbers build rapidly during seasons of "good" rainfall, the overall livestock population is in decline. The decline in livestock numbers in the last two years has been attributed to a severe drought and stock theft.

(2) Overgrazing

Continuous grazing results in the more palatable and nutritious plants being defoliated with no physiological rest, which is critical for the persistence and productivity of subtropical species in the rangeland. Without the opportunity to recover through normal physiological processes, plants weaken to an extent where they die off and are replaced by less productive annuals, resulting in less productive and unstable pioneer species dominating the composition of the rangeland vegetation.

Cattle, sheep, goats and donkeys compete for limited grazing on the deteriorating rangelands. These herds and flocks are supervised during the day while grazing on the rangeland and are "kraal" (housed) at night. Within the limitations of open access by all comers to the village rangelands, livestock herders still make decisions on where to graze their animals on any particular day or season. However, continuous grazing of most of the rangeland is the norm, with no rests from grazing during any time of the year except those areas which are not accessible during dry season because of lack of water. The continuous grazing has resulted in a degradation of the ecological condition of the rangeland. Current practice does not allow for any conservation of fodder for winter feeding or for droughts. The lack of fodder and grazing during the winter is the main cause of the low productivity of grazing livestock. Livestock owners need to change their collective management of their rangelands to be able to achieve any improvement in ecological condition of these rangeland and consequently derive increased benefits from their livestock.

(3) Fodder Trees

Trees are an important component of African savannahs. Browsers like goats depend largely on trees for feed, and some trees like *Acacia tortilis* produces pods that provides a source of protein

in winter. Acacia trees, which are legumes, provide a suitable habitat, through nitrogen fixation and litter fall, to these nitrogen-loving grasses. However tree density is declining. There is a general practice that is to utilize juvenile *Acacia tortilis* trees for home fires for cooking and heating. Introduced species such as Leuceana and Moringa are grown in Sekhukhune but potential value of these species for human and livestock feed is not widely recognized.

(4) Drought

The target area has a history of severe and disastrous droughts. Severe droughts, when rainfall is so low that natural vegetation and/or farming activities are damaged or destroyed, occur regularly and rainfall is very erratic and irregular. Rangeland users believe that the impact of severe droughts is cumulative and there is a long term decline in effective rainfall. The general topography, soil type, low basal grass and lack of surface organic material (mulch) of rangeland results in excessive runoff of rainwater during thunderstorms, reducing the effectiveness of rainfall and resulting in unfavorable low soil-moisture conditions and severe erosion. Abnormally high soil temperatures during summer are also part of the system.

The Comprehensive Agricultural Support Programme (CASP) was introduced by LDA in 2004, to address the lack of infrastructure, including fencing, water supplies, handling and marketing facilities, which required to assist livestock owners move towards the commercialization of their livestock enterprises. This intervention was aimed to support development of infrastructure for communities rather than individuals.

(5) Livestock Disease

The local breeds of cattle, sheep and goats are highly adapted to local conditions and have resistance and tolerance to many of the existing diseases and parasites. In the past, government livestock inspectors conducted publicly funded vaccination, drenching and dipping programs. This type of support is no longer provided and few farmers regularly vaccinate, dip or drench their herds or flocks.

(6) Livestock Associations

Livestock owners in some communities of the target area have, on their own initiative, formed more than 20 livestock associations specifically to address the problem of stock theft. They developed strategies including registration and branding of livestock and community based surveillance programmes in cooperation with local police. These associations offer a platform to build strong capacity and commitment to address a wider range of issues concerning livestock production and productivity.

(7) Poultry Production

Within or near the target area, poultry is produced in both traditional scavenging systems and integrated commercial production units.

A large number of households maintain small flocks of mixed breeds of poultry for egg and meat production. Generally these flocks are small and unproductive. Similar to the grazing animal production, little or no inputs are made into the management of these scavenging flocks. Some household food waste may be fed when available. Newcastle disease regularly decimates village flocks. Predators such as snakes, birds, dogs, cats and indigenous animals are reported to the major cause of the high mortality within household flocks and particularly of newly hatched chicks.

Over the last four years, the commercial broiler producers has been under severe cost pressure caused by large increases in the price of inputs for preparation of formulated feeds (feed accounts for about 60% of the total cost of broiler production). The average net ex-factory price realized for broilers increased only marginally. Profit margins are quoted to be as low as 5-10c per bird after slaughtering. Since this profit margin is basically dictated by the price of the feed, broiler owners have to make difficult management decisions time to time, and a highly effective marketing and distribution channel is thus necessary.

(8) Productivity

All grazing livestock production in the target area is by communally owned systems. Investigations by LDA have shown that herd productivity (mortality, off take and calving rates) is significantly higher among private landowners in the commercial sector than among communal farmers in the ex-homelands. Investment in fencing, vaccination and de-worming is also significantly higher for commercial farmers. These evidences may be too natural, however, private ownership of land may, to some extent, mask the important effects on herd productivity. Other studies have demonstrated that the village operates as a complex system where the homestead area, communal rangelands and agricultural fields are all important resource whose combined and collective utilization is critical for sustainable operation of the existing production system. In particular, the seasonal swap between fields being de-facto private in summer and communal in winter has been critical for animal husbandry. Recent crop failure due to drought meant that very little grazing was obtained from croplands with increased pressure on the rangeland, resulting in the rangeland having no rest from grazing over a number of years. This has inevitably resulted in a long term decline in the productivity of the rangeland.

Livestock seldom receive any supplementary feeding. The time of calving, lambing and kidding is strongly influenced by seasonal conditions. Mating is uncontrolled and inbreeding is common. Herd composition, number of bulls, age structure and other important factors affecting productivity are not managed. Estimates of reproductive performance are not available.

Current off take of cattle is very low. Surveys conducted during 2006 reported that the percentage of cattle sold from herds in the communal livestock production systems was less than 7% of the cattle population. No information or estimates of off takes are available for goats or sheep.

5.1.3 Livestock Marketing

(1) Grazing livestock

Livestock are marketed through either direct sale into the local market or by auctions conducted by professional livestock auctioneers. Farmer responses to a survey commissioned by the LDA suggested most cattle are sold through the informal local market, to speculators and local buyers. The formal market channels (auctions, direct to abattoirs) were most likely to be used by the owners of larger numbers of cattle (100 cattle plus). A majority of farmers with less than 25 cattle did not sell any cattle at all. Goats and sheep owners predominantly sold their animals through the informal local markets[1]

Livestock owners have traditionally claimed that better prices are achieved for their cattle in the local community. The local market demand for ruminants is predominantly associated with the demand for animals for ceremonial purposes. The type of animal demanded for the ceremonial trade is markedly different to that demanded by the commercial sector either for slaughter or for consumption. The consumption of sheep and goat meat is very low due to the costs. Household meat consumption is very low. McNabb[2] reported that 60% of respondents in his study area in Sekhukhune did not consume meat in the previous month and another 35% had meat only on one occasion in the previous month. .

The sale of animals is seasonal. Most cattle are sold between April and July and goat sales peak in June and December. Since 2006, auctions have been held at a number of locations in

[1] NERPO (National Emergent Red Meat Producers' Organization (draft March 2006). Livestock Subsector Analysis of Limpopo Province. Limpopo Livestock Development Trust.

[2] McNabb Douglas (2005). Livelihood Enhancement in The New South Africa: Public Expectation, Environmental Dynamics and "Muddling Through". PhD Thesis, Department of Geography, The University of Sheffield, UK.

Sekhukhune District.

Efforts to stimulate the ruminant livestock market by increasing transparency, bringing in more buyers and encouraging livestock owners to offer animals has gained support among emerging livestock producers elsewhere in the province, but the communal livestock owners seldom participate in auctions. The private livestock marketing companies which conduct auctions promote sales to potential buyers and have a network of local agents who canvass local producers for sale animals. The sales are conducted for animals either as individual animals or as groups. The seller is charged commission of 8% on the final bid price.

The promotion of the auction system has been supported by an extension programme aimed at increasing awareness of livestock owners of the potential value of their livestock and the "commercial" (income) opportunities. Livestock owners have been encouraged to attend auctions to observe the selling process and learn about the important relationship between price and quality. Several constraints to increased participation by livestock owners in the auction system, have been identified: (i) lack of confidence in the system and concern about getting a fair price; (ii) the requirement of animals to be registered and branded under the national livestock identification scheme; (iii) security of livestock from thefts before and after auctions, and; (iv) requirement to have a bank account as payment is by cheque. The auctioneering company has now set 50 cattle (or equivalent) as the minimum number of animals to be offered for sale at any auction for the auction company to participate in a sale. Police attend the sales to settle any disputes about livestock ownership as livestock theft remains a major issue for livestock producers in Sekhukhune.

Buyers cite deterrents to participating in auctions in the district: the distances they must travel, low numbers of animals offered, mixed lots, poor animal condition, lack of adequate facilities and the difficulties of transporting animals out of the district.

Livestock theft is endemic in the district and movement of livestock is closely monitored by police. Despite the efforts made by the auctioneers to provide correct documentation for the movement of animals from the auctions, cattle trucks are regularly delayed for long periods while police check credentials and paper work.

Table 5-3 Numbers of livestock sold and prices received at auctions held in Sekhukhune May to July 2006

Class	Number	Total	Lowest Price	Average Price	Highest Price
Heifers <250 kg	12	30,800	1,936	2,566	3,050
Steers < 250 kg	61	154,605	1,040	2,534	3,160
Bulls	17	55,590	2,300	3,270	4,850
Oxen > 250 kg	139	398,135	1,590	2,864	3,700
Cows	60	190,220	2,250	3,170	4,050
Cows and Calves	20+20	87,150	3,150	4,357	5,250
Old Cattle	11	36,115	2,320	3,283	4,850
Sheep	4	2,400	520	600	640
Goats	47	26,020	360	554	700

Table 5-4 Total Number of animals sold and value at auctions in Sekhukhune

Location	Number of animals sold	Value Rand
Strydkraal	59	63,195
Rietfontein	70	200,100
Immerpan	116	291,555
Mecklenburg	97	300,410
Praktiseer	28	89,660
Total	**370**	**Rand 944,920**

Table 5-5 Registered sellers at recent auctions held within Sekhukhune District

Location	Date	Number of registered sellers
Strydkraal	2006/7/24	41
Rietfontein	2006/6/19	62
Immerpan	2006/6/15	76
Mecklenburg	2006/6/26	86
Praktiseer	2006/5/22	23

While the auction system is presently not frequently used by livestock owners as a means to sell their livestock, the NERPO survey respondents suggested that they considered the auction as offering potential to improve the prices received from the sale of their animals. Farmers' responses to their understanding of the important factors, which determined prices received at auction, indicated that farmers underestimate the influence of age and weight on an animal's value and potential sale price.

(2) Poultry Market

The local market is for live birds, fresh and frozen birds, fresh and frozen pieces and "value added" fresh and frozen poultry products. Local prices fluctuate considerably with currency movements and short term over supply in other parts of the country and the world. The local demand for poultry products is in the lower priced cuts, which are often on the international market at substantial discounts to local prices.

There are eight red meat abattoirs and one poultry abattoir in or near the target area. The usage of the red meat abattoirs is low; most are seldom used. The poultry abattoir near Lebowakgomo has been operational since 2005, but there are reports that the facility will cease operating due to contractual issues with the buyers of the poultry products.

The local preference is to slaughter animals at home for ceremonial purposes. Live chickens are preferred to processed chickens and traditional breeds are preferred to commercial broilers. As the income elasticity of demand for meat products for black communities is greater than one and positive so an increase in average incomes would be expected to lead to a more than proportional growth in demand in the target area. Cross elasticity of demand for livestock products shows that poultry is an important substitute for beef, mutton and pork. Some people believe that there is a definite shift in preference towards chicken meat.

(3) Egg Market

Some investment in layer poultry units for egg production has been made in the target area. These egg production units were seen to have a slight competitive advantage over the commercial sector in the local market, by being able to supply "fresh eggs." However, general stores in the target area sell eggs procured from egg wholesalers who are supplied by large integrated commercial layer farms near Polokwane.

(4) Traditional Bird Market

A variety of indigenous breeds of poultry is kept by households in the target area. While the

numbers are small, this localized low-cost production of poultry offers an opportunity for resource-poor households to produce food for themselves and some cash from sale of surplus birds and eggs. The older generation prefers meat from indigenous birds because it is tastier, darker and more textured than that of commercially produced birds. Consumers pay a premium in local markets for indigenous birds. However, development of the traditional bird market is limited by the high level of mortality due to disease and predators.

5.2 Forestry

5.2.1 Background

The majority of poor people in RSA and particularly in Limpopo Province live in rural areas under conditions of extreme hardship and livelihood insecurity, commonly with lack of access to basic social services, housing and means to support themselves and their families. Different resource users derive direct and indirect benefits from the woodland resource base. These resources supplement household incomes through petty trading and provide a source of "free" products. With the low incomes of the majority of the target area population, the woodland resources are critical for the subsistence and cash economies. The increasing scarcity of wood and non-wood resources undermines rural livelihoods, particularly those of the poorest who are most dependent on natural resources for daily survival. The underlying causes of woodland degradation include population pressure and competing resource/ land uses, unclear and uncertain tenure, limited income earning opportunities and resulting high dependence on woodland resources, weak civil society and general low levels of capacity, financial and other resources.

5.2.2 State of Forests in South Africa

DWAF categorizes natural tree vegetation in RSA into three as follows:

Categories	Definition
Forest	Tree coverage of 80% or more; average tree height of 2.5m or more.
Woodland	Tree coverage of 10% or more and less 80%; average tree height of 1m or more.
Grass land	Tree coverage of less than 10%.

DWAF's jurisdiction covers management of both natural and artificial forest. A survey conducted by DWAF shows that the majority of tree vegetation in RSA is "woodland," and about 70% of "Forest" is artificial forest, or "plantation" (Table 5-6).

Table 5-6 Tree vegetation in South Africa in 2004 (unit: ha)

	State, Public	Private	Total
Natural Forest	287,845	245,824	533,669
Woodland	6,956,152	22,346,164	29,302,316
Plantation	305,962	1,033,320	1,339,282

Source: DWAF web page (http://dwafapp4.dwaf.gov.za)

The area of "woodland" used to be about 42 million hectares of open savanna, which means that about half of them are already disappeared. Of this 42 million hectares, about 11% was converted partially, and 10% was converted completely to agricultural field. There are about 1.33 million hectares of "plantation," that has come to support a multi-billion Rand industry employing over 100,000 people and which is managed for sustainable production. The public sector owns 30% of all the industrial forest plantations, four large private companies 47% and other smaller private companies and individuals the remaining 23%, including an estimated 14,000 hectares established under outgrower and other small scale grower schemes. Most of the industrial plantations are located where climatic conditions are favorable i.e. in Mpumalanga (41%), Kwazulu-Natal (37%), the Eastern Cape (11%), the Western Cape (6%) and Limpopo (5%).

There is one issue to be cautioned. Actual conditions of the woodlands in RSA vary from 10% of tree coverage to 80% of it as mentioned earlier, which makes an estimation of total area of woodland difficult. Some estimation concluded the total area of woodland even as 46 million hectares.

All the nature reserves and primary conservation areas are important water catchment areas. These are some of the most species-rich indigenous forests and harbor many rare and endangered species. The primary management focus of these areas is maintenance of ecological processes and preservation of biodiversity. Although most forests are statutorily protected, many people from adjacent communities have traditional use rights to them. The increasing demands for various forest products have depleted these forests.

5.2.3 State of Forests in Limpopo Province

The vegetation component of Limpopo Province represents three biomes: the forest biome makes up 0.2% of the area, the grassland biome 3.2% and the Savannah biome 96% of the

province's vegetation type. Only 12 % of the total area of Limpopo Province is conserved. Tree coverage of Limpopo Province is 1.26%, which is the lowest level in the nation with Western Cape Province and others. Most dense tree vegetation is Limpopo Province can be observed in a limited areas stretches from Louis Trichardt, via Tzaneen to Drakensberg (see Figure 5-1).

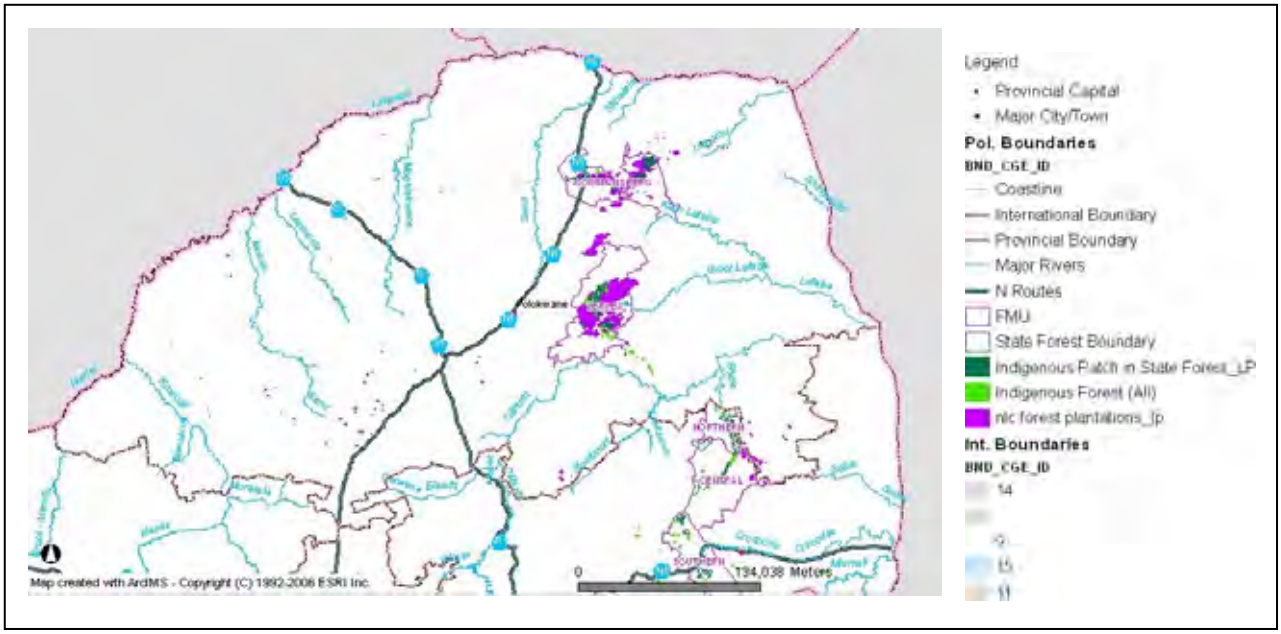

Figure 5-1 Distribution of Forest in Limpopo Province

Source: DWAF web site

Five types of "woodland" are recorded in Limpopo Province (see Figure 5-2). Mopane Woodland can be seen most widely in the province along with Limpopo river and in Kruger National Park (see map 15 of Figure 5-2). These five distribution maps give an impression that Limpopo Province has rich woodland resources, however again, "woodland" does have a very vague meaning with regard to richness or density of tree vegetation.

Only "Combretum Woodland" can be seen over the target area of this study. Combretum Woodland consists of two dominant species of *Combretum apiculatum* and *C. Collinum*. The target area of the Study has been marked by a circle of bold line in map 10. According to this map 10, the target area is identified as "degraded."

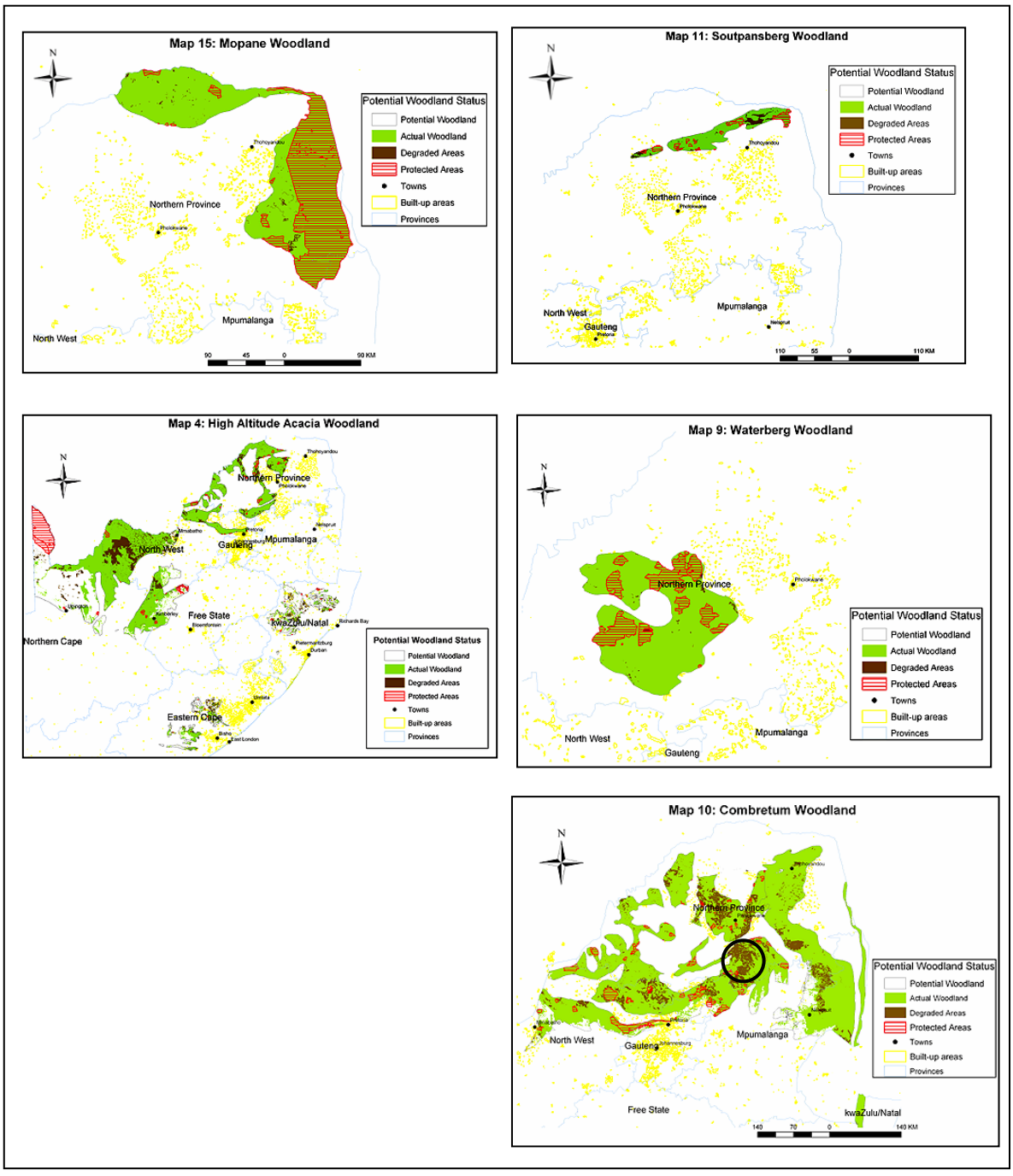

Figure 5-2 Woodland distribution in Limpopo Province

Source: DWAF web site

Latest version of Five Year Strategic Plan of DWAF (2006-2011) emphasizes importance of maximization of derived economic benefit from forests. Priority is put on industrial development of forestry as plantation in the state forests, private land and communal land. Most of the discussion in the report is on “forest,” and consideration regarding “woodland” is limited. Recognition of DWAF on role of forest resources on poverty alleviation can be seen in another report, “State of the Forest Report 2005.” It mentions that “Access to forest goods would not necessarily lead to poverty alleviation but it may prevent intensification of poverty,” and “The creation of employment and business opportunities with forestry areas is probably the most significant contribution that forestry could make towards the reduction of poverty.” This report acknowledges briefly role of forest on soil conservation and water resource management, however, the Study team could not confirm if any specific strategic plan or projects were prepared by DWAF on these issues.

Chapter6 Government Institutions and Policies

6.1 Current State of Administrative Systems

6.1.1 Government in Limpopo Province

(1) Structure

The Premier, who is elected from its legislature, heads the government of Limpopo province and appoints Members of the Executive Council (MEC) to oversee policies and administration of nine executive departments:

- Agriculture;
- Education;
- Finance, Economic Affairs and Tourism;
- Health and Social Development;
- Local Government and Housing;
- Public Works;
- Safety, Security and Liaison;
- Sport, Arts and Culture; and
- Transport.

The departments cover all fields in which the province has power, under the Constitution, to act. Notably missing from the economic development fields are water resources, forests and mining, which are responsibilities of the national government.

The Department of Finance, Economic Affairs and Tourism prepares the annual budget for years from 1 April to 31 March. The budget is presented to the Legislature each March, as the appropriation bill. Preparation of the next budget commences immediately each appropriation bill is passed. Departments complete their submissions for funds before the end of each June.

(2) District and Local Municipalities

The national policy of decentralized decision-making gives local municipality government prime responsibility for planning and resource allocation, with provincial and national departments playing supporting roles. However, the definition and delineation of powers and responsibilities remain still unclear, as the administrative system is still in a transition. The most important provincial and national institutions for the target area are Limpopo Department of Agriculture (LDA) and Department of Health and Social Development (DHSD) of the Limpopo province and Department of Water Affairs and Forests (DWAF) of the national government.

(3) Limpopo Department of Agriculture

LDA is responsible for effecting the national agriculture policy and strategy within the province. The strategic goals for agriculture in the Republic of South Africa (RSA) have been set as (i)

food security and poverty reduction; (ii) land redistribution and farmer settlement; (iii) improving access to and quality of agricultural services; (iv) human resource development; (v) trade development opportunities to support agribusiness; (vi) LandCare program and sustainable natural resource management; and (vii) restructuring of agricultural state enterprises. LDA's mission is identified as "increasing economic growth and reducing poverty by empowering people to manage natural resources in a sustainable manner to allow for sector job creation and wealth creation."

The Head of Department (HOD) of LDA is responsible to the MEC. LDA undertook a major structural change in 2006. Figure 6-1 shows LDA's latest organization chart. Under the HOD, LDA has the following five branches: Executive Branch of Agricultural Technical Services; Branches of Financial Management, Human Resource Management, and Corporate Service; and Sub-Branch of MEC Support Staff. The Executive Branch of Agricultural Technical Service, LDA's most mobile and important unit, has six General Managers under the Chief Operations Officer. The six General Managers are respectively in charge of the Branches of Technical Production Service; Land and Agrarian Reform; Agribusiness and Agricultural Economic Development Planning; Sustainable Resource Management; Agricultural Research and Training Services; and District Services. The functions of the Branches are as follows.

- Agricultural Technical Services: Provides technical backup to sub-sectors in agriculture and supports the district office from technical aspects. Has sections on veterinary, livestock breeding, cultivation, and disaster management.
- Land and Agrarian Reform: Responsible for redistribution of national lands and government-purchased private lands, and establishment of land ownership systems.
- Agribusiness and Agricultural Economic Development Planning: Responsible for agribusiness and agricultural economic development planning.
- Sustainable Resource Management: Responsible for agricultural engineering, management of large projects, soil conservation, and land use.
- Agricultural Research and Training Services: Manages two research stations and two training centers in the province.
- District Services: Responsible for supervision of district offices in the province and promotion of mutual collaboration among them.

As of November 2006, although a few important posts are not filled yet, most LDA staff members took up their posts. How effective the new organizational structure can be remains to be seen.

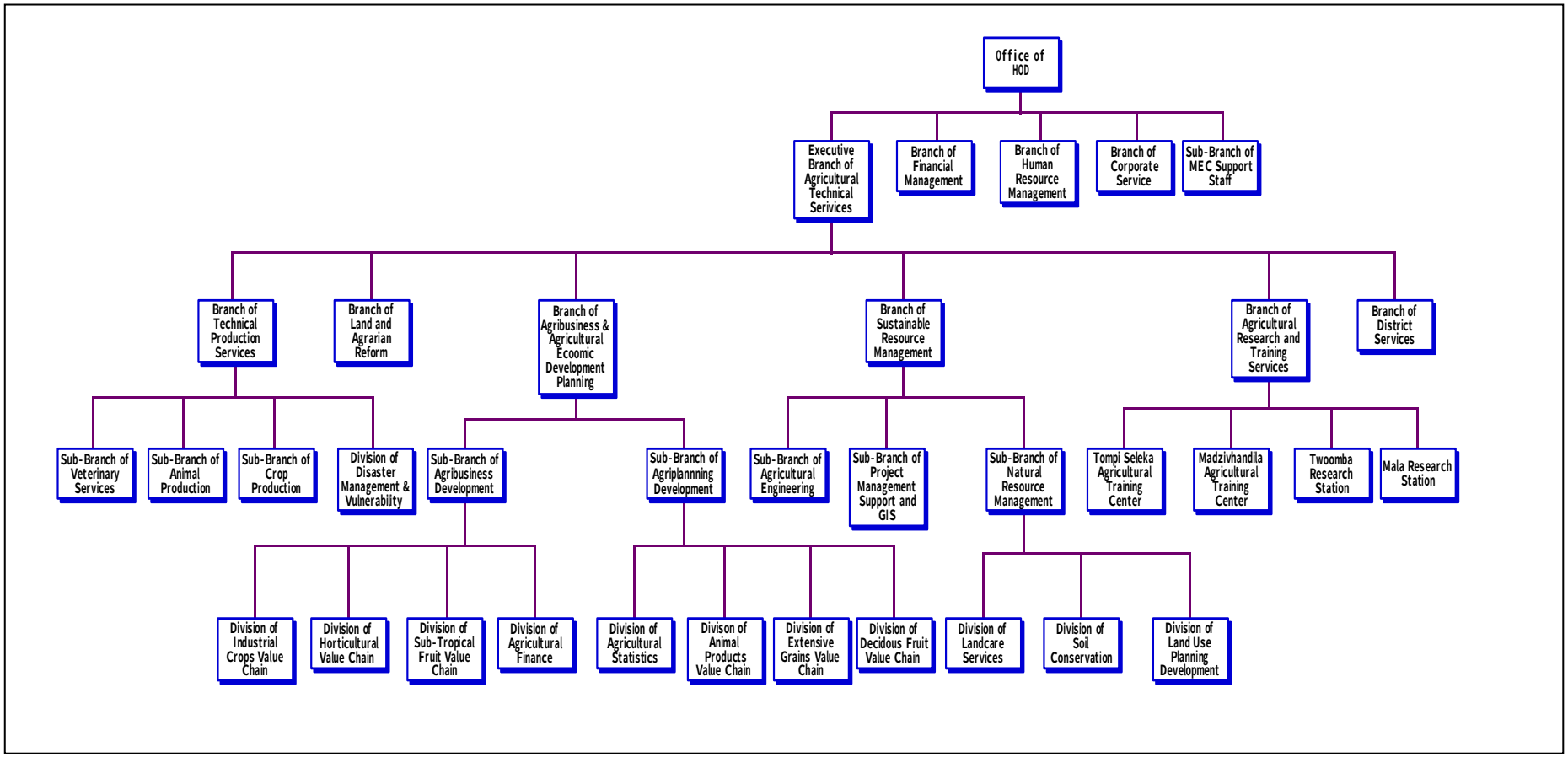

Figure 6-1 Organization Chart of LDA

Moreover, since 2005, LDA has had the basic policies of placing skilled staff in district offices, recruiting younger extension officers, and strengthening cooperation with local municipality governments. Through these policies, LDA aims at the following: (i) it will be possible to plan and implement project in cooperation with local municipalities; (ii) direct assistance to cropping and livestock farmers is strengthened.

LDA's budget allocation for FY2005-6 was about SAR 1,094 million. The actual expenditure was about SAR 980 million, or about 90% of the above figure. But the ratios of payment for capital assets such as projects were generally low: compared to the original budget, "veterinarian services" was 44%, "assistance to farmers" was 75%, and "farmer training" was 60% (all the names were those prior to restructuring).

Agricultural Information Service by LDA

LDA's Head Office has a Communication Service Section that provides various information services. Agricultural promotion materials produced by the Communication Service Section are originally developed by the Agricultural Research Council (ARC) and other research institutions in the country and printed by the National Department of Agriculture (NDA). Many of these materials are in English.

LDA also holds a variety of agricultural events, two to three times each month. Interest of local population in attending these agricultural events is generally high, probably because these events are limited opportunities for ordinary farmers to obtain agriculture-related information. Most of the events are well structured and organized. Singing, dancing and other entertainment programs and messages on HIV/AIDS prevention and other politically important issues are included.

Major issues to be addressed to improve agricultural information service can be summarized into three problems:

① Information flow from LDA is limited only to selected farmers.

The main targets of extension officers' activities are farmer groups practicing community gardening and other "projects," the "emerging farmers." As a result, agricultural information supplied by LDA reaches only a limited number of people in the target area. Given that the majority of the population or households in the target area practice subsistence farming and do not necessarily participate in any "project," their access to agricultural information is very limited. Given the limitations in number of extension

officers, their mobility and their role being field workers for priority projects directed by higher management, this is understandable. Nonetheless, the limited reach of the information service is a significant hindrance to promotion of agricultural development in the area.

② Information service is provided mainly by the Head Office, and involvement of district offices is weak.

Most information activities of LDA are conducted by the Communication Service Section of the head office, and there is no clear mechanism to pick up information needs of farmers on the ground. The staff members in charge of communication and information service at district offices are primarily extension officers and generally see information service work as of lower priority. As a result, collaboration between the head office and district offices is not well organized.

③ Various information services are conducted independently and without complementing each other.

LDA has made a great effort to improve information services such as organization of events, production of educational materials and radio programmes. These activities, considered individually, are well organized and realize good effect. However, they are not well coordinated as an integrated manner, causing inefficiency. For example, educational materials produced at NDA in Pretoria are designed to be standardized so that they can be used in any province, which means the provinces should make some adjustments according to differences in conditions of climate, geography and other factors. However, little work has been done by the Head Office and district offices in this direction.

Agricultural Extension

LDA District Office draws up activities plans on ground according to the development strategy of the LDA while municipal offices carry out extension services in the field. Under the municipal office, a local agriculture extension office is located in each ward. In the target area, Fetakgomo and Makhuduthamaga municipality offices perform under the jurisdiction of the Sekhukhune district office. The extension officers carry out the following functions:

- Ensure proper interpretation and implementation of agricultural development policies
- Conduct participatory rural appraisal
- Provide agricultural support services to farmers
- Execute adaptive research and trials
- Encourage collective agriculture

- Recommend sustainable use of national resources.

The main activities of extension officers are to visit farmers from their own houses. They do not need to go to the office every day unless there is special business at their office. Thus, it is difficult to know the performance of their providing extension services.

Agricultural Research Stations

Two research stations are under the management of LDA. Their main activities used to focus on the promotion of large-scale commercial mono-cropping agriculture, and research for small-scale farming begun only recently. At these stations, tests of varieties and adaptability of dry land crops are being undertaken. But the result of these experiments has not transferred to farmers. Moreover, the research station cannot grasp actual information of small-scale farms. A problem is that there has been little coordination of research and extension activities for small-scale farms.

Agricultural Training Center

LDA has two agricultural training centers. They used to be agricultural colleges and provided higher education on agriculture. In 2006, their primal function was reoriented to skill development of local farmers and LDA's extension officers, and re-designated as training centers.

One of the training centers is Tompi Seleka Agricultural Training Center located in Sekhukhune district. Its responsibility is skill development of farmers and extension officers in southern part of the province including Sekhukhune district, Waterberg district and Mopani district. There are demonstration fields for vegetable and livestock, and fish ponds in the campus, and practical training can be organized. It is also facilitated with dormitory in which trainees can stay, and a long term training course can also be organized. Lecturer of the center covers topics of almost all fields of agriculture, however, most of them have technical orientation of capital intensive farming. Development of training courses on appropriate technologies for small-scale farming is an untouched challenge for the center.

(4) Department of Health and Social Development (DHSD)

DHSD has three critical functions in rural areas: 1) providing comprehensive health services; 2) distributing various forms of financial assistance, including old-age and disability pensions; and 3) grants for poverty alleviation. Thus DHSD receives a very large share of the province budget compared to other departments.

DHSD in FY2003-04 received SAR 5.0 billion for its social welfare function. Exact figure of payments to the target area are not available, as the DHDS has a different definition of sub-district boundaries. For all Fetakgomo Local Municipality and about two thirds of Makhuduthamaga Local Municipality, which is the DHDS's "Sekhukhune Sub-District," the annual distribution of social security exceeds SAR 160 million. Numbers of recipients in the sub-district and monthly rates of pensions and grants are in Table 6-1. The numbers receiving child support grant will increase as the national government raised the limit of eligibility from 7 to 14 years in the FY2003-04 budget.

Table 6-1 Social Welfare Payments in FY2003-04

Category	Rate (SAR/month)	Recipients /1.		
		Limpopo Province	Sekhukhune District	Sekhukhune Sub-district /2.
Old age	640	304,865	48,620	14,665
Disability	640	74,155	9,703	3,031
War veteran	658	390	43	20
Grant in aid	130	43	16	15
Foster child grant	460	4,717	1,539	380
Care dependency grant	640	6,158	934	242
Child support grant	140	282,056	50,230	13,045
Total		672,384	111,086	31,398

/1. As for February 2003
/2. All of Fetakgomo Local Municipality and about two thirds of Makhuduthamaga Local Municipality
Source: Department of Health and Social Development

(5) Department of Water Affairs and Forestry (DWAF)

Mandate of DWAF includes water resource planning, construction and operation of dams and supply for domestic, commercial, industrial and institutional uses, while LDA is responsible for operation of irrigation schemes. DWAF is preparing a water supply development plan for Sekhukhune district by a process of identification and quantification of water sources, estimation of demand and project planning with special attention to technical factors, environment, cost and affordability. DWAF planning and implementation is increasingly linked to local governments.

(6) Local Government in the Target Area

RSA has established an elaborate structure of local government to represent communities. The

Constitution and enabling legislation are strongly committed to participatory approaches; the Local Government: Municipal Systems Act, 2000 specifies “A municipality must develop a culture of municipal governance that complements formal representative government with a system of participatory governance.”

The local municipality is the central unit in the local government administrative system, playing the key roles in planning and supervision of implementation. Sekhukhune district has five local municipalities, including Makhuduthamaga and Fetakgomo. The major functions of the local municipal councils are (i) to pass and administer laws and rules on matters within their jurisdiction; (ii) to prepare and manage development plans and their constituent projects and programs. The Councilors elect the Mayor of each local municipality and form a number of sub committees to deal with various policy areas.

Meanwhile, day-to-day management is in the hands of the Municipal Manager, supported by full-time staff members of the municipal office. The structure of the Fetakgomo Local Municipality is shown in Figures 6-2. Both Makhuduthamaga and Fetakgomo municipalities made considerable progress in recruiting personnel and now have almost full staff complements. However, given the wide range of management duties and limited experience of staff members, there are still serious barriers to the effectiveness in managing the municipalities’ development projects and programs.

According to the Integrated Development Plan (IDP, see next section) of Fetakgomo Local Municipality for 2005/06, the local municipality’s total operation budget is about SAR 160 million. But Fetakgomo Local Municipality’s own municipal budget is only SAR 4.5 million out of this, and the rest comes from contributions from other government agencies and the private sector. The largest portion of the operating budget is for repair of the irrigation scheme in the municipality, which takes up about SAR 112.5 million, or nearly 70% of the total.

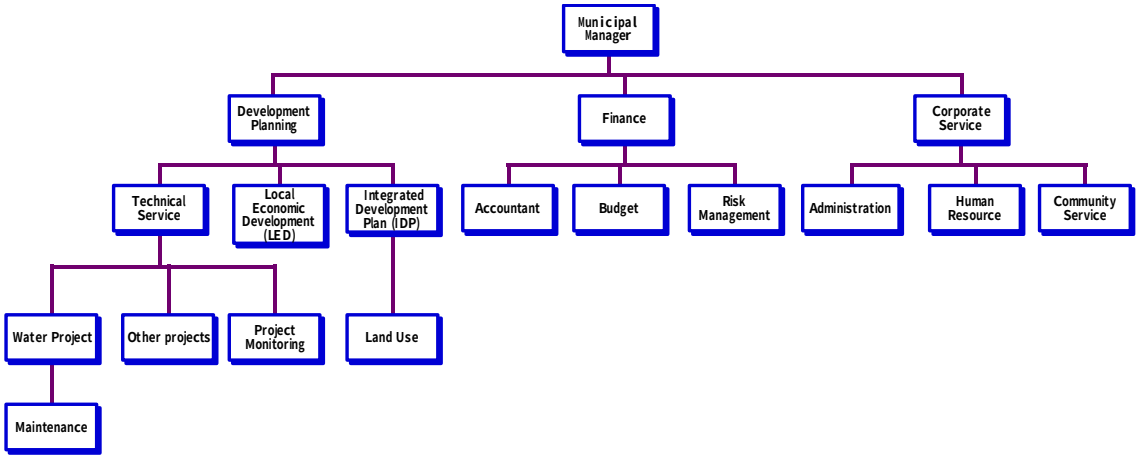

Figure 6-2: Organizational Chart of Fetakgomo Local Municipality

The highest structure in the district is the District Municipality, which is located at Grobersdal, in the south of Sekhukhune district. The main functions of the district municipality are (i) coordination of local municipality Integrated Development Plans (IDPs) into the district IDP; (ii) "alignment" of plans and projects within the district (coordination of activities of the municipalities); (iii) supervising implementation of some projects, especially those affecting more than one local municipality. The District Municipality is headed by the Executive Mayor who is elected from among the Ward Councilors of the constituent municipalities, but must not be a mayor of the local municipalities. The small secretariat includes the Financial Manager, Municipal Manager, Corporate Services Manager, Project Officer, Town Planner and two receptionist / typists. The District Municipality, with little in-house capacity, depends heavily on consultants for strategic planning, project formulation and engineering design and supervision. This solves the provision of capacity in the district in the short term. But it is not necessarily good for fostering the District Municipality's ownership of projects and programs in the future.

(7) Integrated Development Plan (IDP)

The IDP is the centre piece of investment selection, planning and implementation for all districts and municipalities in RSA. Municipalities and districts are required to prepare IDPs as a condition for eligibility for funding from the national government. Major undertakings for municipalities and districts include (i) identification of possible projects, (ii) preparation of the project plan and the IDP, (iii) obtaining approval and finance, (iv) implementation of the project based on the IDP, (v) review of progress and outcomes, and (vi) revision of the IDP for the following year.

(8) Formation of the IDP

Each local municipality undertakes a standardized process to ensure the participation of its residents in formulating the IDP. The planning process starts with extensive consultation with the communities and proceeds through committee work until the IDP is finalized. Preparation should include substantial input from provincial and national departments, which are obliged to assist the municipal authorities with technical advice, suggestions for projects and comments on proposals of committee members and the public. This technical input is vital to improve quality of projects in the municipal plan and to enable the departments to prepare appropriate plans of their own.

Key elements of the IDP are analysis of resources and development options, outline strategy, long list of candidate projects and prioritized projects. The projects are presented in five "clusters" - housing and infrastructure, socio economic, local economic development, spatial and environmental and institutional – with priorities identified for each. The plan then identifies the highest-ranked projects across the clusters, to represent the municipality's request for approval and financing.

The qualities of the IDPs vary. Because the Fetakgomo and Makhuduthamaga local municipalities had limited human resources and little finance to retain consultants, the IDPs in their early period had only superficial assembly of facts, analysis of data. Furthermore, weighing of options was not well-reasoned. But the qualities are now gradually improving.

(9) The Approval Process

IDPs prepared by local municipalities are collated by the district municipality and submitted to the MEC of the Department of Local Government and Housing (DLGH) of Limpopo province, to be scrutinized for compliance with legal requirements and for inclusion of only projects that are "realistic." The MEC forwards his written comments on each municipality's IDP to the district municipality and to the National Department of Provincial and Local Government (NDPLG), which checks if IDP's priority projects are consistent with national policies and strategies. The national budget then allocates funds for capital and recurrent items for each district and local municipality. The IDP process was intended to be introduced for the whole of RSA for budget year FY2002-03. However, the municipalities had varying planning capacity, resulting in only some IDPs being ready for that budget year. The procedures for approving and funding IDPs became fully operational for the FY2003-04.

The fiscal year for municipalities differs from that of the provinces and the national government,

running from 1 July to 30 June. The lagging of the fiscal year allows municipalities to prepare their budgets with full knowledge of their allocations from national and provincial budgets and the nature and cost of projects to be implemented under the programs of national and province departments. But in reality, this prevents municipalities from coordinating their budgets with the annual operation plans of provincial agencies such as LDA.

Mainstream funding for investment projects by local municipalities is national government allocation of equitable share and conditional grants. There is also a set of large temporary "funds" for specific purposes - including those titled Municipal Infrastructure, Project Viability, Local Economic Development, Institution/ Capacity Building and Financial Assistance and those for public works and land reform – available to local and district municipalities. Further funds are provided to 13 "nodal areas" of which two, including Sekhukhune, are in Limpopo province, to assist the poorer districts to "catch up" with more advanced parts of the nation. However, as seen in the IDP of Fetakgomo Local Municipality, most development projects within municipalities are implemented by other agencies such as LDA, DWAF and the public works department.

(10) Implementation of IDP

Municipality projects funded in the IDP framework are implemented by one or more of the provincial or national departments, LDA, or by the district or local municipality by contract with the private sector. The district municipality is supposed to oversee a process of "alignment" to ensure complementarity of the projects of local municipalities. The province government applies a process of alignment to ensure coordination among its implementing departments. However, procedures for coordination and management of projects within local municipalities are not fully developed, at least for the two subject local municipalities.

(11) Review and Revision

Municipalities are required by law to review annually the priority project lists, including taking note of the comments of the MEC for Local Government and Housing on the previous year's list of proposed projects. The revised list of priorities is to be submitted to DLGH as part of each year's planning and budget framing exercises.

6.1.2 Civil Society in the Municipalities

(1) NGOs

As of 2003, the Limpopo Province NGO Coalition lists 117 members, with their major specialization fields being:

- Rural development (31 members);
- Health (17);
- Training (8);
- Youth (6); and
- Women (4).

The 26 NGOs with bases in Sekhukhune District specialize in:

- Rural development (8);
- Youth and rural development (1);
- Environment (1);
- Health (5);
- Small, micro and medium enterprises (SMME) (2);
- Human rights (2)
- Early childhood development (2);
- Education (2);
- Women and youth (1);
- Community development (1); and
- Culture (1).

While many NGOs have appreciable capability, their sources of funds are severely limited. Generally, these NGOs are able to obtain operation funds only from donors or the government for specific programmes or projects.

(2) Community-based Organizations

The main occurrence of the numerous CBOs in RSA is at the "grass roots". There are discussion forums in most communities and many single-purpose groups are formed – such as for improving security in towns and villages and promoting women's affairs.

6.2 LDA's Agricultural Policy

6.2.1 Background

The LDA's priority issues after apartheid era can be roughly divided into the privatization of the former Agricultural and Rural Development Corporation (ARDC), the rehabilitation of the large scale irrigation schemes and transferring control of them to local residents, the reallocation of agricultural land, and ensuring food security and raising incomes for the impoverished black population. The rehabilitation of the large scale irrigation schemes and ensuring food security and raising incomes for the impoverished black population were particularly related to this study. Given the ambitiousness of these goals, the government has invested large amounts of money into rehabilitating the irrigation schemes and distributing packages for small-scale chicken farming (including leghorn chickens, cages and feed) and a vegetable production package (including fences, pumps, seeds and fertilizer). However, these aid policies were unable to achieve the initial goals. The main factor behind this was that the schemes failed to consider

the need to improve the farmers' skills, as they had had no experience with family farming under the previous administration. As a result, management of the water use associations for the irrigation schemes collapsed and the facilities could no longer be operated. The chicken farming and vegetable production packages repeatedly encountered the problem whereby activities ceased as soon as the supplies initially distributed had been used up. On the other hand, LDA suffered a serious lack of knowledge on the techniques needed to improve small-scale farming and ways to popularize such techniques because in the past they had built up techniques more suited to larger commercial farming. Therefore, most of the techniques that LDA introduced to poor farmers were merely miniaturized versions of techniques used on large farms. The trust between farmers and LDA was lost as the aid for small-scale farmers that were so inappropriate both technically and in the approach to its dissemination resulted in a series of failures.

LDA used aid from donors to try and remedy this situation. This will be discussed below, but the main attempts among them were BASED, which aimed to expand a participatory extension method with aid from GTZ, and PRIDE, which was started with this study. Apart from the donor supported activities, LDA has been operating LRAD to promote land redistribution among the smallholders.

6.2.2 Most recent strategy

(1) Strategic Plan of FY2006/07

The LDA's 2006 strategic plan highlighted the catchphrase "from farming to agricultural industrial development." This likely originated from the LDA's past and recent experiences described below.

One is based on the sense of crisis arising from the decline in the contribution that Limpopo province's agriculture is making to the province's economy, as land reforms, land redistribution and ARDC's privatization not only fail to yield full results, but the agricultural products from these farming lands used to generate have been lost. Another is based on the belief that, instead of a welfare-like method which diffuse small scale support to large number of farmers and farming groups, small farmers should be organized to produce products that are then marketed so that farmers receive more direct economic benefits. Finally the third is based on the concept that farmers should be organized and access points from the LDA integrated, in light of the LDA's own recognition that their extension system is still weak and that expansive business development is difficult.

Currently, the key phrases behind LDA's agricultural development are "commodity-based

approach," "value chain" and "massification." The organizational reforms described above in particular adopted the commodity-based approach and value chain. Previously one section was in charge of the food security program, but this was divided up and staff members were reassigned according to product, such as livestock, cultivation and garden crops. Also, in the agri-business sub-branch, all the divisions have "value chain" appended to their names.

(2) ASGISA, JIPSA and LDA's Strategic Plan

The government of RSA in 2004, under the initiative of the vice president, showed the basic framework of country's economic development for the following ten years in "Accelerated and Shared Growth Initiative for South Africa: ASGISA." All the provincial government agencies, including the department of agriculture, must follow this basic framework for their respective development strategies. After 1994, RSA has enjoyed about 3% of annual economic growth. It looks comfortable, however, there are significant numbers of poor population, who are not embraced as a part of the beneficiaries of the economic growth. ASGISA admits the duality of the nation's economy, which consists of the "first economy" i.e. the economy driven by large scale global companies, and of the "second economy" i.e. informal, under-developed and mostly black economy. Based on this understanding, ASGISA indicates possibility of development of the "second economy" by using dragging power of the "first economy." Followings are the six main categories listed in ASGISA for mainstreaming of the "second economy."

- Infrastructure programmes
- Sector investment (or industrial) strategies
- Skills and education initiatives
- Second Economy interventions
- Macro-economic issues
- Public administration issues.

One example described for the "Sector investment strategies" was business outsourcing such as "call centers." Tourism is another, and among agricultural sector, promotion of biofuel production is picked up. These priority sub-sectors are to be the puller for development of small scale black business. For the "Skill and education initiative," professional skills such as engineers and scientists; managers such as financial, personnel and project managers; and skilled technical employees such as artisans and IT technicians are listed as immediate needs.

In order to form an uniformed manner of response to ASGISA in the agricultural sector, "National Intergovernmental Forum for Agriculture and Land" was held. In this forum, following five priorities were set as pillars of the agricultural development strategy.

- Broad based AgriBEE (Agricultural Black Economy Empowerment) and integrated food security
- Sector investment in labor absorbing and competitive value chain
- Bio-security and disaster management
- Research, extension, education and training
- Cooperative government and building of partnership

These priority areas are basically a reflection of ASGISA, and essence of strategic framework is also shared with ASGISA that mainstreaming of black farmers into major agricultural economy of the country will be achieved by using strength of "commercial agricultural sector" as the pulling force. For this purpose, organization of black farmers, promotion of high value products, and linking them to the main agricultural market of the country are the selected challenges as the most urgent issues. LDA's latest strategy mentioned in the previous section is also set along with ASGISA.

LDA's strategic plan has been formulated within the framework of ASGISA. LDA has also developed a list of ASGISA programmes as shown in Table 6-2

Table 6-2 ASGISA programmes of LDA

CLUSTER PRIORITIES	KEY DRIVERS/PROGRAMMES	KEY ACTIVITIES
INVESTMENT IN PUBLIC INFRASTRUCTURE	1.1. Implement sector specific infrastructure investment plans within the PGDS framework.	1.1.1. Restructuring of Smallholder Irrigation Schemes (RESIS) & ARDC Projects (Facilitation & Planning)
		1.1.2. Construction and repair of bulk water infrastructure (Pipeline, canals and storage dams) to 24 + 37 Irrigation schemes 5500Ha + 2800Ha
		1.1.3. Installation of infield irrigation systems to 24 + 37 schemes in 2006/07 FY for 5500Ha +2800Ha
	1.2. AgriSMME's development.	1.2.1. Development of agricultural micro enterprises.
		1.2.2. Develop 8 Poultry Houses
		1.2.3. Development of vegetable irrigation infrastructure.
		1.2.4. Sixty (60) Borehole drilling and equipping
	1.3. Agribusiness development and market access development.	1.3.1. Establishment of two (2) Fresh Produce Pack-House Facilities
		1.3.2. Aquire 12 Agroprocessing Facilities
	1.4. Comprehensive Agricultural Support programme.	1.4.1. Animal Health Infrastructure repair & development: 30 Dipping Tanks, 52 Crush pens/Handling facilities & 100KM Fencing

CLUSTER PRIORITIES	KEY DRIVERS/PROGRAMMES	KEY ACTIVITIES
KEY SECTOR DEVELOPMENT STRATEGIES	5.1. Provincial Growth and Development Strategy.	5.1.1. Limpopo Agricultural Development Stratgey Document
	5.2. Provincial Growth and development Strategy.	5.1.2. Establish Horticultural Clusters: Phalaborwa Corridor & Sekhukhune District
	5.3. Introduction of commercial aquaculture production amongst emerging farmers.	5.1.3. Aquaculture Strategy Development
	5.4. Drought Relief Programme.	5.1.4. Drought Management & Mitigation Strategy Document
		5.1.5. Establishment of Fodder Banks. Tšwelopele Scheme Lead Project
	5.5. Disease control/ Bio-Security Issues.	5.1.6. Disease Control & Management Strategies and Protocols
ENHANCE ECONOMIC INCLUSION	6.1. Agribusiness Development Academy In Sekhukhune with Flemmish Financial Support.	6.1.1. Establish & co-fund Agribusiness Development Acedemy In Sekhukhune: Farmer capacitation, Institutional development & Market Information
COORDINATED SECOND ECONOMY INTERVENTIOS	7.1. Restructuring of SLAG projects located across 13 local municipalities.	7.1.1. Launch the de-registration campaign, restructuring and business re-modeling
	7.2. Blouberg Integrated Livestock Enterprise Cooperative.	7.2.1. Feasibility Study Report: Cattle+Goat Abattoir; Milk & Hides markets
	7.3. MAFISA* (Demand-led Access via DoA).	7.3.1. Promote project/ cooperatives/commodity financing approach
Increased R&D Spending and diffusion of new technology	8.1. Bio diesel Incubator at Tompi Seleka Farmers Training Center.	8.1.1. Establishment of bio diesel incubator in collaboration with ARC, CSIR, UNIVEN, TIL & UNILIMPOPO
	8.2. Agave Development And Research Programme.	8.2.1. Quality and productivity research for Limpopo agava Americana and sisal

There is another national initiative, also led by the vice president, called "JIPSA (Joint Initiative for Priority Skills Acquisition)." This initiative is a materialized mechanism for the "Skills and education initiative" of ASGISA. JIPSA also recognizes RSA's duality in education and human resource, and follow the same strategy that the advanced educational institutes and training centers should strengthen the linkage among them for a purpose of skill and educational development of black people in the country. This is an initiative of specified period for one and a held year from March 2003. Priority skills and educational fields are:

- High level, world class engineering and planning skills for the "network industries," transport, communications and energy all at the core of our infrastructure programme;
- City, urban and regional planning and engineering skills desperately needed by our municipalities;
- Artisan and technical skills, with priority attention to those needs for infrastructure development;
- Management and planning skills in education, health and in municipalities;

- Teacher training for mathematics, science, ICT and language competence in public education;
- Specific skills needed by the Priority AsgiSA, sectors starting with tourism and BPO and cross cutting skills needed by all sectors especially finance; project managers and managers in general;
- Skills relevant to local economic development needs of municipalities, especially developmental economists.

Change of the agricultural colleges of LDA to the training centers was probably decided with a concern of JIPSA.

6.2.3 Major programmes of LDA

(1) Broadening Agricultural Services and Extension Delivery (BASED)

This programme is supported by GTZ, in LDA's Chief Directorate of Support Services. The programme aims to improve extension and research support to poor farmers in ex-homelands through participatory approaches. The programme's first two phases (1995 to 1997 and 1997 to 2002) were piloting and introducing phases and mostly conducted within two districts. In the phase three, scheduled for 2002 to 2005, operated throughout the province, and LDA took over activities from GTZ.

The program's three-pronged strategy is to: (i) train extension officers in participatory approaches; (ii) link farmers' organizations with researchers and other experts; (iii) assist provincial service delivery units to adapt their organization to participatory approaches. A distinguishing feature of the program is that it has no resources to fund projects implementation by the trained communities. GTZ provides only technical assistance to LDA. The program is designed in the belief that the major impediment to rural development is delivery of public service to rural people, rather than any shortage of material or financial resources.

(2) Limpopo Agricultural Development Program (LADEP)

This is a Finland-supported programme and the first phase started in 1997. Originally, it was attached to DWAF and set out to promote woodlots and agro-forestry. Participatory approaches were applied to select and design 11 projects, including two in the Sekhukhune district. However, the rural communities showed little interest in forestry and all but one of the 11 projects were redirected to crop, livestock and environment management projects. In the second phase lasting from 2002 to 2006, 28 sites (irrigation scheme or upland farming project relying on wells for its water source) were selected with the objective of "ensuring a stable revenue source for small farmers with the introduction of multiple techniques for managing natural

resources." Comprehensive aid such as maintenance of irrigation facilities, chicken farming and pig farming, introduction of commercial crops, provision of agricultural equipment, and implementation of necessary training is provided through the participatory approach. According to the report at the completion of the second phase of LADEP, less than half of the target groups had actual production experience. The third phase of LADEP began in October 2006.

The concept on agricultural development behind this programme is that small agriculture can expand into an agri-business by providing five forms of aid—building infrastructure, improving production techniques, organizational management capacity, marketing capacity and capital accumulation—in a comprehensive and phased manner. An important precondition of this concept is that the main target of this programme should have enough water sources for vegetable and horticulture. Based on this concept, potential products are not limited to vegetables, but could also include high value-added products such as fruit, broiler chickens, pigs and macadamia nuts. Some groups grew to the point that they were shipping their products to Johannesburg. Technology training and consultation to strengthen the organizations will play an important role in achieving this goal, but almost all of this is entrusted to external providers.

(3) LandCare Programme

This programme was supported by the Australian Agency for International Development (AusAID) and functioned through LDA, aimed to promote crop and livestock production in a framework of conservation farming techniques. The program focused initially on Limpopo province but expanded its activities around the country in 2000. There are no LandCare projects within the target area. The program has been successful in institutionalizing its operations and there is now at least one LandCare officer in each province. The program is now effectively ended in Limpopo province as a donor-funded programme, where its activities have been incorporated into the regular activities of LDA. AusAID support now concentrates on institution-building from the national government.

(4) CASP and MAFISA

Comprehensive Agricultural Support Programme (CASP) and MAFISA (Micro-Agricultural Finance Institution of South Africa) are programmes that both provide financial aid to black farmers. CASP is grant aid exclusively for agricultural infrastructure, with LDA taking responsibility for providing materials for fences, water supply facilities and other necessary agricultural infrastructures.

MAFISA is a micro-credit programme for agriculture established by the national government. It is funded by money that the NDA gives to the Land Bank, and the Land Bank in turn screens

applications and manages the fund. Responsibilities are divided, however, so that the LDA publicizes MAFISA and attaches requests from farmers. Only farmers' groups are eligible for funding, not individual farmers. The program began in FY2005/06, but has not been adequately publicized. As a result, it did not provide any financing in FY2005/06. It has a commitment line of approximately SAR 20 million in FY2006/07, and as of November 2006 approximately 170 applications amounting to SAR 18 million had been approved. The interest rate is a simple annualized rate of 8%, which is much better than the Land Bank's usual rate of 11%. MAFISA has just started and it is too soon to determine what kind of results it will achieve and what kind of difficulties it will run into.

(5) Land Redistribution for Agricultural Development (LRAD)

The South African government started its effort to redistribute its productive land among the "previously disadvantaged" black population with a programme named "Settlement and Land Acquisition Grant (SLAG)." This programme supplied RSA16,000 to each household of landless and/or poor population in the country. However, since RSA 16,000 was not enough to acquire enough land for any productive activities, many groups were formed to raise the amount of money. This movement resulted in a whole variety of difficulties and complications of group management among the beneficiaries, including conflict between resident and non-resident members, difference of interest in farming among the members. Due to confusion caused by these group management problems, the government ceased SLAG, and altered by another programme of LRAD in 2001. Based on the experience of SLAG, LARD expanded the government support to better off black farmers or emerging farmers, who would be able to better use the opportunities of the land redistribution.

Part 3 PRIDE in SEKHUKHUNE

The Study team conducted 8 different pilot projects through the third year to the fifth year (April 2004 till November 2006) of the Study. Implementation of these pilot projects was named as "PRIDE in Sekhukhune (PRIDE)," by LDA. This Part 3 is a record of the implementation and achievement of 7 pilot projects of PRIDE, excluding Local Capacity Development Project.

Chapter7 Achievements of PRIDE and its Evaluation

7.1 0.1 ha Integrated Farming Project

7.1.1 Purpose of the project

The target area was constrained in terms of water resources, the amount of capital available to the farmers and the farming experience of the farmers. This made it difficult to introduce the normally recommended farming models. The pilot project for the 0.1 ha integrated farming scheme aimed for the development and demonstration of a farming model which could just about work under such difficult conditions.

(1) Water

The target area's annual rainfall is only 400 – 500 mm and so the production of maize, which is the main staple grain, is extremely difficult. Therefore, maize is hardly ever produced other than in exceptional places such as in the highland areas which have relatively high amounts of rainfall. Sorghum, which is the second most important grain after maize, is planted on a third of the target area in the southern part, which has a relatively high amount of rainfall. Sorghum needs less water than maize to grow successfully. However, a sufficient crop of sorghum cannot be expected when drought strikes the area. It is difficult to develop projects for producing staple crops in such an environment accordingly.

The irrigated lands which are medium- or large-size in the target area are situated along the Olifants river. There are also irrigation facilities where the water is channeled from the Lepellane dam. However, most of them cannot be used or have not been used due to the reasons mentioned in the Chapter 3 of this report. Even if it becomes possible to use these irrigation facilities in the future, it would be difficult to use them for the production of staple crops which need relatively large areas of land. If the facilities are used for staple crop production, only a small portion of the total population in the target area would be able to get benefit from such irrigation. Therefore, it is more suitable to use the irrigation for the

cultivation of vegetables which needs a smaller area of land and will benefit more people in the target area.

Other water resources include boreholes and reservoirs which are scattered around the area. Many can be found along the Lepellane river and the Olifants river, although others can also be found elsewhere. Only a limited amount of water is available for irrigation from boreholes and reservoirs, and so it is difficult to use them for the production of staple grains which require large areas of land. Therefore, it is more reasonable to use these water resources specifically for the cultivation of high-added value products which need smaller areas of land, such as horticultural crops like vegetables.

(2) Capital resources of the farmers

The village profile survey which was conducted by the Study team in 2003 found that the average annual income per household in the target area was 8,111 Rand. It is estimated that the average annual income per household as of October 2006 is about SAR 10,000, after the economic growth and the inflation since 2003 are taken into account. This is the minimum level of income needed to sustain basic living and farmers barely have any spare money to invest in agriculture. Therefore, it is inappropriate to consider adopting farming models which are based on production technologies which require a lot of purchased materials with large cash expenditures. An opposite technical system is needed such as the type which utilizes local resources or the type which makes use of waste and by-products and so would not require large cash expenditures.

The fact that the farmers' incomes are at the minimum level also means that they cannot take a big risks. Any project scheme has some risk of failure. Farmers in the target area and in similar areas can rely only on individual savings or "mutual help in the community" and the "harvests from the rich natural environment" in the case of failure. However, getting a sufficient amount of savings is difficult given the income levels of the farmers in the target area. Therefore, it is necessary to minimize the risks in new projects by reducing the size of the project as much as possible.

(3) Farming experience

There are people who have worked on large-scale commercial farms as farm labors during the apartheid period in the target area, but only a few people have experience of independent farming on their own farms. Even if they were peasants, they would have been proper farm managers if they had been independent farmers in the past. However, farm laborers did not have a chance to learn the sense of management or management skills. They have not been trained to overcome difficulties by themselves when problems arise by using their own ingenuity. What is even worse is that the donation-type projects implemented by the government and NGOs are prevailing in the target area, and this is encouraging the

dependency of farmers on external support. It is not possible to go straight to introducing large-scale farming in such a situation and so gradually starting with small-scale farming is the only sensible way forward.

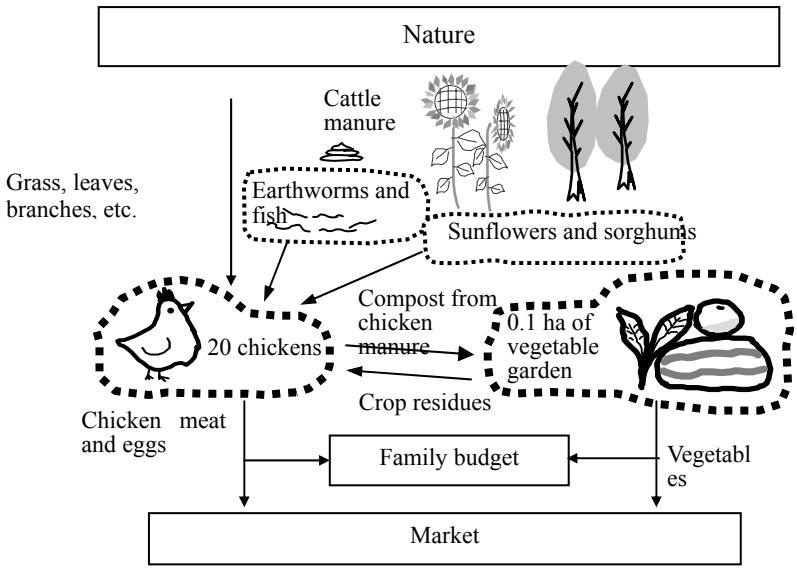

Figure 7-1-1 0.1 ha Integrated farming

In light of the situation seen above, the type of farming which could work in such conditions is "intensive vegetable cultivation which utilizes untapped resources and the locally available by-products on a small-area of land." This project set the appropriate size of the vegetable garden at 0.1 ha given the income level in the target area. How could this project achieve a soil fertility level which is sufficient for vegetable cultivation? The soil in the target area is generally infertile with small amounts of organic matter. Continuously applying only chemical fertilizers will harden the soil and reduce the productivity of the soil in the long run. Organic matter should be applied to improve the soil. Therefore, small-scale poultry unit was integrated into the farming system in order to gain both the short-term fertility which is needed for intensive vegetable cultivation and the long-term soil improvement through applying organic matter. Chicken manure is mixed with crop residues, etc., and composted, in order for it to be applied to the vegetable garden. The number of chickens which would be needed to provide the necessary nutrients for a 0.1 ha vegetable garden was calculated to be about 20 based on the manure production volume, etc. Composting the manure mixed with plenty of crop residues and grass would increase the water retaining capacity of soil as well as increasing the organic matter in the soil. Improving water retaining capacity of soil is extremely important in areas with scarce water resources.

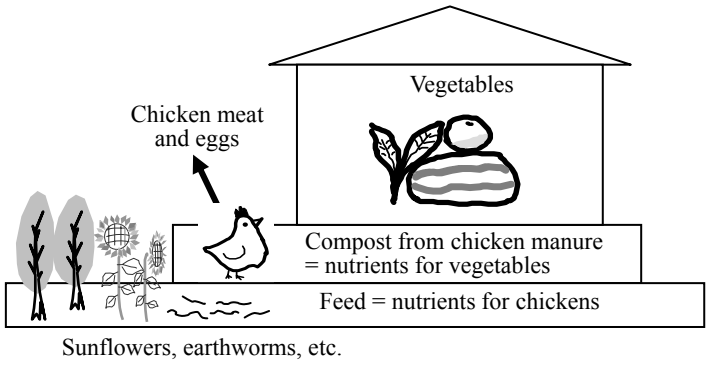

Figure 7-1-2 Nutrient supply system in 0.1 ha Integrated farming

The most difficult problem for chicken farming is the feed for the chickens. In order to reduce

the cash cost for purchasing all the feed, this project aims to self-supply the feed as much as possible. Sources of proteins are especially important. Protein for livestock feed often conflicts with the food needed by humans in poor areas. Earthworm and fish cultivation were introduced, as well as sunflower cultivation in this farming system. Of course, this project also encouraged people to produce sorghums and millet as sources of calories in feed production. The standard area of land for producing feed crops for about 20 chickens was set to be 0.1 ha for sunflowers and 0.1 ha for grains. Therefore, 0.3 ha of land is needed all together when 0.1 ha of vegetable garden is added.

The following are the characteristics of the model for 0.1 ha integrated farming.

1) Even the inexperienced farmers can operate it because the model made it easier by starting on a small-scale.
2) Production using a small amount of water is possible due to the small-scale intensive horticultural farming.
3) Risks can be minimized due to the small-scale of the farming.
4) Cash expenditure can be suppressed by proactively utilizing natural resources and by-products.
5) Soil fertility and water holding capacity can be improved over the long term by soil building using compost from chicken manure and plant-derived organic matter.
6) Farmers can get about double the amount of profit as they earn now by selling the products mainly in their community.

7.1.2 Input

The team provided materials to build fences and chicken sheds, vegetable seeds, farm tools, supplementary feed for the chickens, etc. to the farmers. The team also held various training sessions to improve the abilities of the participating farmers. Farmers on the other hand provided land, labor and water.

7.1.3 Process of implementation

(1) Selection of three farmers' groups

Three groups were selected as the target farmers' groups for the first year of the project. The groups are from Mphanama, Radingwana in Fetakgomo municipality, and Marulaneng in Makhuduthamaga municipality. All the groups have already been conducting group farming. Original idea of expected target was individual farmers, but all the selected target population was in groups as a result of an examination of the target candidates based on the nominations by the LDA, with the condition that they had water resources for irrigation. This project conducted an on-site investigation to confirm the current farming conditions of the farmers and also confirmed the intentions of the group members. The following explains the situations of the three groups at the time of the launch of the project.

Mapue project in Mphanama

The farmers were producing vegetables including tomato, beetroot and spinach, on about 5 ha land area. They were using the same farming method as the large-scale commercial farms in the country but did it on a smaller scale. They were applying chemical fertilizers after plowing the land hiring a tractor, purchasing vegetable seedlings made by commercial nurseries, planting them and spraying them with pesticides. Irrigation water was pumped up with an electric pump to a tank installed at a height of 5 m and discharged by gravity. Many of the input materials were provided by the Department of Health and Social Development as subsidies or provision of goods. Although the type of farming using local resources was a completely new method for the farmers, they showed their interest in our proposal. The group had about 20 members. Most of them were women including the group leader, and she appeared to be a reliable person.

Mpepu Self-help project in Radingwana

The farmers were mainly producing vegetables such as tomato and green pepper on about 1.5 ha sloped land area near to the river. Irrigation water was ground water which was pumped up using an engine pump (the ground water level is high due to the location by the river) to a tank installed at the height of 5 m and discharged by gravity. The group was using almost the same farming method as the group in Mphanama, which was a high-input farming method. The soil had more organic matter than the land in Mphanama because the farmland was located along the river and so it was more advantageous for vegetable cultivation. However, they seemed to have a disadvantage in selling their products because the farmland was a long way from the center of the village. The group had about 20 members. The group was mainly composed of women along with some men. The man who seemed to be the leader figure looked highly reliable. They showed a very strong interest in our proposal.

Mohlaka Motala project in Marulaneng

This group has carried on with traditional rain-fed farming, mainly growing mixed crops of sorghums, bambara nuts and water melons on about 7 ha flat land area. They met the team when they were considering expanding their farming into vegetable cultivation after completing a borehole with the donation by the Department of Health and Social Development. However, electricity was not yet available and they could not operate the pump. According to the farmers, ESKOM told them that they would immediately carry out the construction work. Most of the group members were women. They seemed to be earnest and hardworking. There did not seem to be many members who could take the initiative to get through difficulties when external conditions become difficult, but there were collaborators who could help the group in such a situation from within the community.

As mentioned above, 0.1 ha Integrated farming is the farming model for individual farmers. Therefore, the team suggested that each group would pick three model farmers and make three

units of 0.1 ha model farms in each group. However, all the three farming groups insisted that they would rather employ a style in which everybody would participate in the model farms by dividing each farming group into three sub-groups instead of picking three individuals, which was finally accepted. As the result, farming field in each group was divided into three parts with 0.1 ha of area each, and introduced three sets of chicken sheds and three fish ponds.

(2) Launch of the project starting with the chicken rearing

The project was started with establishing poultry unit, which would be the foundation for the improvement of the soil fertility in the vegetable garden. First work was construction of tilapia fish ponds. The members used a power shovel by themselves to dig the ponds in Mphanama, and the participating farmers manually dug the ponds in Radingwana and Marulaneng. The three groups completed digging three ponds of 5m square and 1.5m deep. The activity manifested the farmers' strong enthusiasm.

Construction of chicken sheds was launched in May 2004. Local chickens are free-range and picked food by themselves, but we needed to confine the chickens because the main purpose of this poultry unit was to collect their manure. The structure was based on a simple design for the chicken shed with a floor area of 2.5m × 5m, five pillars joined by squared timbers and it had a corrugated iron roof on top. It would be better to utilize poles and thatch which can be collected and used in the local area to save the cost, however, there were only a few trees which were suitable for construction because of the dry climate. This project also needed to ensure that the roofs were completely waterproof in order to avoid the possibility of degradation of chicken manure which was the main purpose for doing all this. Therefore, the above materials were provided for the farmers. The farmers themselves, following the study team's instructions, engaged in the construction.

The inside of the chicken shed was bedded with about 10 cm deep of dried grasses and leaves of sorghum. Chicken manure would be dropped onto the bed, be discomposed and become compost. The most important point here is not to house too many chickens. This is to ensure that the amount of chicken manure dropping on the bedding does not exceed the decomposing capacity of the bedding. Adding new bedding materials and controlling water content are also important. The composting process progresses on its own and the materials do not cause a bad odor if the system is managed well. Training sessions were held to explain the mechanism of composting to the farmers, giving information such as the C/N ratio, oxygen and moisture content. It was emphasized that the bedding in the chicken shed should be managed to always meet these conditions. As a result, all

Photo 7-1-1 Preparing bedding material with sorgham stem.

farmers learnt more or less adequately how to manage the bedding.

We introduced 4-week old chicks of the Pochefstroom Koekoek variety, which is one of the pure bred, from the Poultry Department of the Agricultural Research Council (ARC) in August 2004. The productivity for eggs and meat of the pure bred is in between the varieties which are used in large-scale commercial chicken farms (such as broiler and layer) and the indigenous chickens. They have the property similar to the local varieties, and so they are tough enough to grow in a harsh environment. The Pochefstroom Koekoek variety can also be used when egg production is the main purpose of the farming because they produce about 220 eggs per year. It is said that the indigenous chickens only produce 100 – 150 eggs per year.

The participant farmers had no experience in housed chicken farming although they were familiar with free-range chickens in backyards. The largest difference between free-range and confined chicken farming is that the latter requires feeding. However, it takes more than six months to harvest the feed crops. It also needs some time for tilapia to be a protein source to increase to enough number in the ponds. Therefore, the project selected and distributed feedstuff until the farms started producing enough feed. The distributed feedstuff included maize bran, sunflower seeds, fish meal, and soybean cake. Especially emphasizing the importance of proteins, training sessions on nutrients for the chickens were held.

Silage also was selected to produce as chicken feed. Silage, which is produced through anaerobic lactic fermentation of green grasses is normally used as cattle feed for use in the winter. This was given to the chickens in this project. Silage made of ordinary green grasses is not high in calorific value or protein content, but it enables the supply of green grasses which have high vitamin content during dry seasons. Lactic acid bacteria in the silage maintain bacterial flora in the intestines of the chickens in a suitable condition.

The chickens of all three groups gradually started producing eggs from November 2004. Eggs should be collected appropriately to avoid other chickens eating the eggs or eggs getting covered in chicken manure. Therefore, simple egg-laying boxes were produced and distributed. The inside of the box is separated into a front part and a back part by a floating partition. The egg is laid in the front part of the box and rolls on the sloped box floor through a slit under the partition to the back part of the box. Chickens cannot touch the egg once it has rolled to the back part of the box. The farmers can pick up the accumulated eggs by opening a door in the back of the box.

Photo 7-1-2 Chiken shed. Box at the corner is a egg-layig box.

(3) Vegetable production and application of chicken manure

When the chicken manure compost gradually started accumulating in October 2004, training sessions were held, focusing on soil building, seedlings growing and transplanting. First filial generation (F1) varieties were avoided not to pay for the seeds every year. Instead non-F1 varieties were recommended, so that the seeds can be collected from the mother plants every year.

The reactions of the farmers to the project varied. The group in Mphanama village did not initially try applying chicken manure onto the garden because the NGO which was funded by the Department of Health and Social Development kept giving those chemical fertilizers and vegetable seedlings, which the farmers kept using. In the case of the group in Radingwana village, the leader understood well the meaning of the technology system of the project. They started applying chicken manure straight away and cultivated beetroots and tomatoes, which produced steadily growing results. Introducing electricity was a sticky problem for a while for the group in Marulaneng village when they launched the project. It took a long time for the electric power company to install the drop wires after the installation of a transformer was completed. The negotiations with the power company and the electricians proved to be a problem because they were beyond the farmers' abilities. Therefore, in the period between the end of 2004 and the beginning of 2005, the group in Radingwana village started showing some results for vegetable cultivation with the combined farming method, but on the other hand, the other two groups were at a standstill just before the launch of the main activities although their chicken farming was on track.

Photo 7-1-3 Shining leaves of beat root in Radingwana

Photo 7-1-4 Shipping of harvested tomatoes (Radingwana)

(4) Cultivation of fish, earthworms and feed crops

The fingerings of tilapia was introduced at the end of May 2004 from the cultivation unit at the Tompi Seleka Agricultural Training Center under the LDA, but many fish died of unknown causes in July and August. Therefore, earthworm cultivation, as an alternative source of protein, was launched in February 2005 with support from experts in earthworm cultivation. Earthworms double in number about every three months, although the breeding speed varies depending on the variety. Earthworms were cultivated in a bed of organic matter mixed with soil, which was 10 cm in height, 50 cm in width and 1m in length. The bed was covered with a black shading net because their breeding speed slows down in high temperature. Earthworms

feed on any organic matter and so their food does not conflict with food for other livestock or humans. They propagated well by adding unmarketable small tomatoes and water melons which were left in the garden, as well as cattle manure, goat manure, etc. The tilapia fingerlings, which were re-introduced in April 2005, have propagated without trouble since then.

Photo 7-1-5 Cultivation bed for earthworms (individual farmer)

We suggested to the farmers' groups that they plant sunflowers, sorghums, etc., as feed crops from January 2005. As a result, they succeeded in growing sunflowers, but they were hardly able to gain a harvest from the other crops because of problems such as insufficient rainwater and the ripened grains being eaten by birds.

(5) Participation of 10 new individual farmers

The new fiscal year May 2005 saw new applications from individual farmers and 10 farmers were selected based on certain criteria, in addition to the existing three farmers' groups. Four people in them were participants on a different project "RESIS" under LDA, and they had water tanks which were 5-m square and 2 m in depth that can store surface water from rainfall. The other six people were chosen from the first graduates of the "Project for the Practical Training of Farmers" which was another pilot project in PRIDE. Many of them were young members in their twenties and thirties. The 10 new members were trained on the farmland in Radingwana village, whose progress was ahead of the other two.

The necessary materials were delivered to the individual farmers in July and they started building fences and chicken sheds using their own labor and that of their families. They launched earthworm cultivation in September and then introduced chickens. In December, they attended the training for composting techniques, which included collecting cattle manure which was readily available in the *kraal*, as well as the basics of vegetable cultivation. This was because the launch of the vegetable cultivation would be delayed if they waited until the chicken manure could be used. Therefore, the plan was changed so that they could gain at least some cash income by growing vegetables from an early stage while temporarily using the compost from cattle manure. The individual farmers started cultivating vegetables such as

Photo 7-1-6 Leader of Radingwana group (left) Explaining to the newly starting farmers from 2005 who came to participate to the farmer-to-farmer training

tomatoes and beetroots from the beginning of 2006.

The vegetable cultivation of the individual farmers generally progressed without trouble during the period from January to March which is the rainy season. The possession of water resources became the critical factor which decided the outcomes after that. The four members who had the water tanks had trouble harvesting sufficient water or had used up the collected water. Some people who relied on public water faucets were able to use the water with no problem but other people had to stop using the water due to complaints from neighbors. This project also taught the farmers further soil building and mulching[1] techniques to reduce water usage as part of the training, but it could not gain the sufficient results within the pilot project period.

The end of fiscal year 2005 saw the introduction of a new variety of chicken. It started to be clear that the Pochefstroom Koekoek variety previously introduced could not incubate eggs by themselves because of a lack of broodiness. This meant that the farmers had to keep purchasing chicks from ARC. It would be extremely difficult for the farmers to contact the faraway institute and send for a small number of chicks by themselves after the project ended. The variety which emerged from a sustainable point of view was the Ovambo variety. According to ARC, the Ovambo variety could hatch eggs by themselves because they possess high levels of broodiness. The variety was introduced to the group at Radingwana village which had good farming results and to one individual farmer on a trial basis. The results are yet to be seen as of October 2006.

7.1.4 Achievements

(1) Sales performance

Among the three farmers' groups which were selected in fiscal year 2004, only the group of Radingwana village was able to achieve a good performance in sales more or less continuously. The group in Mphanama village insisted on the mixed method by using chemical fertilizers donated from other organizations. They did not seem to understand the difference between our approach and the high-input approach, despite the training and guidance sessions. The group in Marulaneng village was very successful at cultivation during the period between November 2004 and around March 2005, but then they faced the electricity problem again and so could not continue to achieve successful results. With regard to individual farmers, the amount of water available made a difference to the results, as mentioned above. Table 7-1-1 summarizes the outcomes.

[1] Mulching is a method to prevent water from evaporating, suppress weeds, prevent erosion of topsoil, etc. by covering the surface of the soil with grasses, etc.

Table 7-1-1 Outcomes of the 0.1 ha Integrated Farming by types of farmers

	General results	Vegetables	Chicken farming	Marketing	Performance
Mphanama village	Materials donated by the Department of Health and Social Development continued to be provided during the project period, and so the group missed the opportunity to learn the meaning of the introduced technique (which was different from the high-input farming method) by conducting hands-on practice.	Compost from chicken manure became available to the group but they could not give up using chemical fertilizers, and so they cultivated vegetables by applying both the manure and the fertilizers until the end. They carried on purchasing vegetable seedlings produced by manufacturers instead of producing them by themselves.	The chicken farming progressed smoothly during the first one and half years but egg production was less than expected. Then, there was an outbreak of Newcastle disease and some of the chicken population was hit by the disease. Sunflowers were produced to be used as the feed crop.	The products were sold to people in the community. Merchants from outside the community also came to purchase products using cars because the community was close to the village center.	It is difficult to determine their performance because they did not follow the technical instructions.
Radingwana village	The group achieved satisfactory results while understanding the new technique by accumulating knowledge from every training session which lead to good results in the field through experiencing small successes.	The soil was gradually improved after using the quality compost made of chicken manure and the group continued to successfully cultivate vegetables. However, the yield for tomatoes stayed at 1.8 tons per 0.1 ha. This can be further increased if they improve their management techniques.	The chicken farming progressed smoothly but the egg production was less than expected. Compost from chicken manure was constantly produced and it contributed to the improvement of the soil. Feed crops failed because of drought. Production of earth worms and fish were put on track after going through some twists and turns.	The products were sold to people inside and outside the community. There were occasions where merchants came to purchase the products and the farmers transported the products with the help of neighbors' cars.	Good (About R6500 of profit)
Marulaneng village	The group suffered from long periods in which they could not pump up water and so they could not cultivate vegetables, because of prolonged and complicated negotiations with the power company which largely exceeded the problem-solving capacities of the farmers.	Although the group could not cultivate vegetables for a long period of time because of the electricity problem, they had very successful yields for tomatoes, green peppers, etc., when the water was available. The group therefore realized the merits of compost made from chicken manure.	The chicken farming progressed smoothly during the first one and half years but the egg production was less than expected. Then, there was the outbreak of Newcastle disease and some of the chicken population was hit by the disease. Sorghums were produced to be used as the feed crop.	The products were sold inside the community. The community is next to Jane Furse, the largest town in the target area, and so the farmers are expecting that they could sell the products there if they produce enough products.	Bad
Individual farmers	The farmers who secured water resources progressed with vegetable cultivation without trouble and gained confidence in their production techniques. On the other hand, the production by those who lacked adequate water resources stagnated.	Most farmers had steady successes in the cultivation of tomatoes, etc., when irrigation was possible. The focus for the foreseeable future is to work out how to progress with full-scale vegetable cultivation using compost from chicken manure during the rainy season starting from the end of 2006.	Their chickens were more seriously hit by diseases than the chickens of the above farmers' groups and many of them died. Only about a half of the original number survived. The farmers who had larger areas of gardens harvested sunflowers. A half of the farmers managed to get the earthworm cultivation on track.	The products were sold in the community.	Good for those who were able to use water and bad for those who were lacking in water resources

Table 7-1-2 is the sales performance of Radingwana. Firstly, two periods were excluded – 1) the initial period of the project when they were focusing on launching the chicken farming and waiting for the chicken manure to become ready, and 2) the period when the production and sales stopped for five months due to the circumstances. The average sales of the rest of the months were SAR 537 per month. The conversion value for the annual sales calculated from this monthly value was SAR 6,449 per year. Adding the sales from eggs to this value made average total sales of SAR 7,179 per year. More than 70% of the vegetable production was tomatoes and a little less than 20% was beetroots. The group also produced small amounts of spinach, green peppers, onions, carrots, etc.

Table 7-1-2 Conversion values for the annual sales of produce from the farmland in Radingwana village (Unit: SAR)

	Team A	Team B	Team C	Average
Annual sales	9155	6680	5701	7179
Vegetables (incl. in above)	8511	5910	4926	6449
Eggs (incl. in above)	664	770	755	736

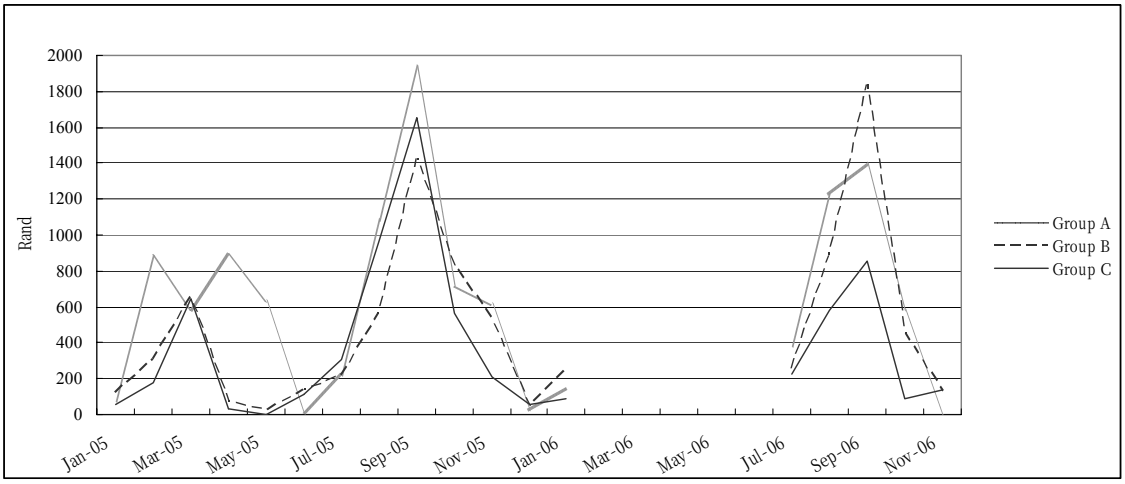

Figure 7-1-3 Changes in the sales of produce from the farmland in Radingwana village

The graph above shows the changes in monthly sales. The production peak of a year is from August to October which is the winter cropping season. The second largest yields come during the summer cropping season, from February to May[2]. The performance shown in the graph backs up what farmers said which was that winter cropping was easier if water was available

[2] However, as mentioned above, the production and sales stopped from February to July 2006 due to circumstances.

because the sunlight was too strong and pest outbreaks disturbed the summer cropping although the season has more rain.

On the other hand, this project has not gained enough accumulated data from the individual farmers who started the project from fiscal year 2005 because they started harvesting vegetables in 2006. Therefore, this project examined the sales of four farmers who had relatively steady yields during a period of six months starting from April 2006. Most individual farmers had less than 0.1 ha of land area for the project. Therefore, this project converted the values to the values which were equivalent to 0.1 ha using specific factors and calculated the estimated sales in a case where they produced the products all the year around.[3] As a result, the estimated average annual sales were calculated at about SAR 9,700.

Table 7-1-3 Estimated annual sales for the individual farmers (Unit: Rand)

	A	B	C	D	Average
Periods of vegetable cultivation	Mid April – early July	Late April – late May	Early May – late September	Early April – late June	
Land areas for vegetable cultivation (m^2)	142	53	50	220	
Vegetable sales for the above-mentioned periods and land area	1,010	410	1,525	1,616	
Estimated sales for the year-round cultivation on 0.1 ha of land area	6,939	8,926	11,159	11,809	9,708

[3] Firstly, each amount of sales was converted into the equivalent amount of sales for cultivation area of 0.1 ha (1,000 m^2). However, it is expected that the smaller the actual area when it is started the more difficult it is to expand the scale later. Therefore, the factors were multiplied to convert the amount of sales for different size ranges of farmlands as follows: less than 50 m^2 would not be subject to the conversion; multiply by 30% for the farmlands within the size range of 50 – 100 m^2; 40% for 100 – 200 m^2; 50% for 200 – 300 m^2; 60% for 300 – 400 m^2; 70% for 400 – 500 m^2; 80% for 500 – 700 m^2; and 100% for 700 m^2 or more. For example, the individual farmer A has 142 m^2 of land. We simply converted the values to the values equivalent to 1,000 m^2 of land and then multiplied the resulting values by 40%. With regard to the conversion for the length of period, it was assumed that the cultivation system is almost the same in all the target areas and calculated the values for certain periods based on the monthly sales for the first fiscal year of the group in Radingwana village which had a record of year-round cultivation─first looking up during which period of time the individual farmer had sales, adding one month each before and after this period, then calculating the component ratio of the sales of the Radingwana group during this period out of the total annual sales, finally assuming that this component ratio was the same as the component ratio of the individual farmer's sales during the period that he/she actually had the sales, when it is presumed that the individual farmer had the year-round production. For example, the individual farmer A had sales from late April to early July. The converted sales value for 0.1 ha during this period was SAR 2,845. The component ratio of the sales of the Radingwana group from March to August was 41% of the annual production. It was assumed that this ratio was the same as the component ratio of the sales of the individual farmer A from April to July. Therefore, the estimated value for the annual sales of the individual farmer A was calculated as follows: R2,845/41% x 100% = R6,939. The reason for adding a month each before and after the period when the individual farmer had sales was because there was a month or so difference in the cultivation system between the area of the individual farmers and the area of the Radingwana group although it was assumed they were almost the same, and so it was needed to adjust this difference, as well as in order to make the evaluation a little stricter.

(2) Costs and profit

As for the costs, many of the purchased materials were provided by the study team during the project period and so it is difficult to know what the farmers' costs would have been if they had been providing these materials for themselves. Therefore, it is preferred to consider how much cash expenditure would be needed if the farmers have to bear the costs of materials after the project ends. The labor of the farmers or that of the families is excluded from the cost calculations. This is because other opportunities for work in the target area are unlikely and there is an excess of labor available. Therefore, it is considered that there is a hardly need to take into account the opportunity cost[4] for the labor of the farmers or for their families.[5]

With regard to vegetable cultivation, the cash expenditure was small because the farmers manually plowed the land with hoes[6], the only used fertilizer was chicken manure compost which was harvested from the chicken unit and the seeds were collected by the farmers from the mother plants. However, every time the farmers cultivate tomatoes they have to purchase insecticide in order to suppress red spider mites which attack tomatoes. This costs about SAR 125 per year and it is the only variable cost. With regard to the depreciation cost for the fixed costs, the total cost for farming implements including poles for tomatoes is about SAR 600. The farming implements can be used for 6 to 7 years in the arid target area and so the simple depreciation cost for 6 years is SAR 100 per year. It is considered that the total cost for the vegetable cultivation will only be about SAR 250 per year even when other miscellaneous costs are included.

With regard to the cost of the feed for the chickens, we assume that the farmers do not need to buy sunflowers which they can grow by themselves but they will purchase other sources of calories and additional proteins. This is estimated at SAR 650 per year. The chicken shed cost SAR 2,700 when the project funded it, but the farmers can make one for SAR 2,000 when the roof materials, pillars, etc., are the only purchased materials. The depreciation cost for 10 years is therefore calculated at SAR 200 per year. Adding the cost of feed to this will make a total cost of SAR 850 per year.[7] The annual sales performance for eggs was about 730 and so the chicken farming sector is calculated to have a SAR 120 deficit. However, the chicken produce

[4] The opportunity cost is the estimated cost of how much a person could have earned if he/she had another opportunity for work.

[5] In business accounting, the labor cost needed for the production of goods is included in the production cost. Categories other than the production cost are the distribution cost, general administration cost and the company profit. However, in the initial stages of small-scale farming, the focus is whether they could gain enough pay to compensate for labor of the farmers and their families. The pay for the labor of farmers and their families is the combined value of the labor fee for production, labor fee for management and the company profit. In reality however, labor fees for production and management take an overwhelmingly large part of the pay in small-scale farming and so there is no point in discussing only the company profit. The company profit will become important when farmers expand the farming scale in the future.

[6] All the farmers were mainly plowing their land manually except the Mphanama group who always employed tractors for plowing.

[7] As mentioned below, the cost for chicks was excluded because we are planning to breed the chicks in-house by introducing varieties which have a high broodiness such as the locally produced varieties.

manure which contain nutrients that are normally contained in SAR 424 worth of chemical fertilizers[8]. When this value is included, the chicken unit gives about a SAR 300 surplus. The low profit from the chicken farming is derived from the fact that the egg production from the Koekoek variety was less than initially expected, and that the earthworms, fish, etc., had not propagated sufficiently to become an amount large enough to be used as feed.

To summarize, the following are the results of an examination of profit and loss based on the performance of the farmers' group in the Radingwana village. The profit from vegetables is calculated at about SAR 6,200, by subtracting the cost of SAR 250 from about SAR 6,450 of sales. The profit from chickens is SAR 300. Therefore, the total estimated profit is about SAR 6,500.

The yield will increase in the future if the productivity of the soil increases further as the soil improvement progresses, and if the farmers' crop management techniques improve including in pest control. We can predict this because it is said that the standard yield for tomatoes on 0.1 ha is 6 tons to 10 tons although the present unit yield in Radingwana village is only about 1.8 tons per 0.1 ha[9]. There is still significant room to increase the unit yield if the farmers make progress in improving the soil and improve their cultivation techniques. They should pursue increasing the amount of production per unit of land area before expanding the land area which would be accompanied by an increase in water usage and the need for finance.

7.1.5 Evaluation results and the challenges for future activities

(1) Evaluation results

The project goal which was set at the time of the projects launch was for "the selected farmers to be able to adequately manage the 0.1 ha Integrated farming system," and the indicator for the achievement of the goal was "70% or more of the participating farmers turning a profit at the time of the projects completion." Out of the three areas of farmland that were selected as farmers' groups in fiscal year 2004, the group in Mphanama village was excluded from the evaluation because it did not implement the proposed farming method. The group in Radingwana village succeeded in turning a profit as mentioned above. The group in Marulaneng village only has about six months of vegetable cultivation due to the electricity problem, but the vegetable sales during this period and the sales of eggs which were shipped year-round when added together were about the same amount as the annual cost. If this is a 50% achievement rate, the total achievement will be roughly 75%. It is difficult to determine the success of the individual farmers selected in fiscal year 2005 because insufficient data has

[8] We estimated this value based on the nitrogen content in the compound chemical fertilizer "2-3-2" which is popular in South Africa. Compost from chicken manure also contains large amounts of important nutrients and constituents that contribute to the improvements in the physical properties and biological properties of the soil, but these values are not included in this calculation.

[9] The value is taken from the vegetable cultivation manual table of Hygrotech which is a major manufacture of agricultural materials.

been accumulated. However, individual farmers C and D in the above-mentioned table have already achieved more than SAR 1,500 in sales, and they seem to be gaining some profit.

On the other hand, the indicators for mid-term achievement for each sector were "the medium value of the 2 years of average annual egg production exceeds 2,600 eggs while 70% or more of the feed is covered by using in-house produced feed," "50% or more of the sources of protein for chickens is covered by fish harvested from the aquaculture pond," etc. These goals were not achieved as has been explained above. With regard to vegetable cultivation, intensive farming was aimed for, and so the indicator for achievement in this sector was that "the average yields of major vegetables will exceed the average yields of the same crops grown by small-scale farmers who did not participate in the project by 20% or more." It seemed that the result was about the same level of yields as the other farmers. Even the group in Radingwana village, which was the most successful, has been also fully engaged in learning the techniques at a beginners' level for the past two years, and so they have not started making use of the techniques to achieve more intensive cultivation.

(2) Challenges for future activities

Almost all the target farmers including the 10 individual farmers selected in 2005, other than the farmers who suffered from external conditions such as irrigation, were able to successfully produce and sell vegetables. In light of this result, it can be concluded that the 0.1 ha integrated farming model with a core element being "vegetable cultivation using compost from chicken manure" can function well. Specifically, it was demonstrated that even soil in the target area which contained a small amount of organic matter can produce significant yields if the soil quality is improved by applying compost made from chicken manure and plant-derived materials, and that the products can be sold mainly within the community.

However, some of the individual farmers selected in fiscal year 2005 are struggling to cultivate the vegetables because of insufficient available water. This project gave them advice on the following countermeasures to the water shortage: (1) dig a reservoir and increase the number of reservoirs if they already have one for water harvesting; (2) prevent water evaporation using mulching, etc.; (3) increase the amount of organic matter applied in order to accelerate soil improvement and therefore accelerate the water holding capacity of the soil; (4) give up full-scale vegetable production during the dry seasons and switch over to enterprises which can be done using a smaller amount of water such as the production and sale of vegetable seedlings; (5) reduce the number of chickens in order to cut down on the cost of the chicken farming sector; and (6) introduce water-saving technologies such as the drip irrigation tube.

Rain-fed cultivation in the target area was as difficult as expected, and much of the feed crops production for chickens failed except the sunflowers. Therefore, it was found that they need to rely on purchased feedstuff as part of the feed for the chicken. However, they should consider

utilizing commercial food waste from the urban districts as another source of self-made feed. The first superstore was opened in Apel in Fetakgomo city in October 2006. One of the possibilities that emerged was utilizing food waste such as expired bread, etc., which is discarded by the superstore. This project gave advice on finding a transport method for the project participating farmers who live near the superstore.

Even if the amount of purchased feedstuff is reduced using various methods, they will still need to increase the profit from the chicken farming sector in order to cover the cost of purchasing the feedstuff. Therefore, this project introduced the Ovambo variety as an alternative to the Koekoek variety in the final stage of the project. The following are the reasons for the introduction of the Ovambo variety: (1) there will be no need to purchase chicks because the Ovambo variety and the indigenous varieties can be bred on farm; (2) farmers can produce meat chickens because the variety can produce chicks by themselves; and (3) there could be more profitability in meat chicken production than in the production of eggs.

7.2 Livestock Owners Group Support Project

7.2.1 Purpose of the project

The livestock sub-sector makes a significant contribution to the economy of Limpopo Province and accounts for half of the gross income from agriculture sector within the province. Over 90% of this economic activity associated with livestock production is in the commercial sector. However, while making a minor contribution to the output, the communal sector has over 60% and 90% of the cattle and goat populations of the province.

In Sekhukhune district and other areas with similar semi-arid and ex-homeland conditions, livestock play an important role in the social and cultural activities of the society and ownership of livestock affords the owners status within the community. Livestock are consumed or infrequently traded in times of need and are considered to be an important part of the household savings, wealth and prestige. Livestock and the rangelands are also a major food supply and an economic resource which have further potential to significantly contribute to the wellbeing of the people.

However, apart from labor, in most circumstances, no inputs are made for livestock production. To realize the potential of the livestock sector presents a number of challenges. Many effective and traditional practices have been discontinued particularly in the control, access and use of the commonly owned rangelands and water resources. LDA has initiated a number of programmes aimed at increasing the contribution of livestock to household food supply and incomes. These programmes have not achieved their objectives due to disregard of market forces and competition, inadequate organizational and management design concepts, lack of appropriate participatory approach, and lack of extension backup.

To test the hypothesis that “benefits derived by livestock owners from their livestock could be improved and increased,” this pilot project was planned and implemented. In essence, the Livestock Owners Group Support Project is a consultative process of community facilitation. The role of the intervention by this project was to facilitate a consultative process with the community, starting with the existing knowledge, experiences and resources of the community to identify and test opportunities for improving benefits from the ownership and management of livestock. The main assumptions behind this are that livestock owners have considerable knowledge of their local conditions and circumstances, which are the basis for livestock owners to identify constraints and opportunities to improve the benefits from their livestock, and that the existing dependency syndrome in the communal sector could be reversed by structured facilitation of external supporters. For this purpose, this project drew on the principles of the participatory extension approach / participatory development approach (PEA/PDA), of The Broadening of Agricultural Service Delivery Programme (BASED).

Along with the continuous facilitation to the livestock owners, appropriate technologies to improve or replace existing practices were demonstrated as a participatory action research. This project explored opportunities within the communities' low input livestock systems through a number of strategic approaches:

Utilization of Local Resources and Organizational Capacity

- intensification of local production of local breeds mainly through introduction of innovations in husbandry practices (vaccination, fodder production)
- integration of modern and traditional veterinary practices
- supplementary feeding to improve nutrition using local materials
- adaptation of local livestock management systems for improved animal husbandry
- focus on livestock keeping at the household level
- use local materials for shelters/handling facilities

Integration in the Livelihood System

- ensure food security and cash through sale of produce in local markets
- respect of local value system and knowledge
- consideration of labor/capital/socio-economic constraints in the introduction of innovations

Integration of livestock into the cropping systems

- forage production in field crops (agro forestry, legumes as cover crops etc)
- use of arable areas for winter feeding (resources sharing), and nutrient recycling – crop residues such as feeds and use of manure in local fields

This project consists of five components:

1. Capacity building of livestock owners' associations and special interest groups.

Livestock owners are assisted to organize themselves and form effective livestock interest groups and associations. These groups provide the forum through which the livestock owners will interact with the project livestock extension team to develop and implement self help programmes for improving benefits from their livestock.

2. Capacity building of government livestock extension services.

The skills and knowledge of animal health and extension officers are improved so that these officers can support the process of forming and strengthening of livestock owners' associations and interest groups and to improve service delivery through more appropriate technical information to the target people.

3. Improvement of rangeland management.

The basic principles of rangeland management are introduced in a participatory way. Concepts of fodder flow planning are emphasized. A small area that served as a rangeland study area was to be fenced off in every participating village. The principles of rangeland management are demonstrated with an aim of developing appropriate management strategies for communal areas and of creation of fundamental awareness on rangeland management among communities.

4. Improvement of fodder production in household patches.

The evaluation and introduction of adapted, versatile legume species are promoted to facilitate household patch production for own consumption, animal feed and soil fertility build up. Rainwater harvesting and soil moisture management practices are developed and promoted to supplement the erratic rainfall. Principles of fodder conservation and strategic feeding are introduced.

5. Improvement of production of village chickens.

Self help, appropriate feeding strategies and innovative strategies to construct chicken houses are promoted with the aim of improving management and care of village chickens. Control of Newcastle disease is also considered an important strategy to increase survival rates of the birds.

7.2.2 Input

The team provided the participants materials for fencing, seeds of fodder crops, and plastic sheets for construction of water-harvesting structures. All the works necessary to install these materials were done by the participated livestock owners. Another important input, or intervention, of the team was provision of "opportunities to improve their capacities," including seminar, training, field visits and workshops, which was main character of this pilot project.

7.2.3 Process of implementation

This project was implemented in the villages of Manganeng, Mphanama and Strydkraal from December 2003 to March 2006.

(1) Capacity building of livestock interest groups

The farmer capacity building component followed a process shown in Table 7-2-1.

Table 7.2-1Phases of capacity building of livestock associations and livestock interest groups

Phase	**Activities**
Phase 1 Initiating change	● build trust with individual livestock keepers ● identification of existing livestock organizations and analysis of strengths and weaknesses ● looking for innovators ● feedback to the identified groups to motivate them to act on their own.
Phase 2 Searching for new ways	● creation of vision and awareness on SWOT with individual interest groups ● creation of local ownership of problems ● group organization with linkages with service providers (identify and learn bout service providers), possible solutions ● Internal and external innovation (exposure visits) ● sharing and feedback ● Identification of concrete technical options to try out by the group
Phase 3 Strengthening local organization capacity	● developing community plans ● develop strategies for local organization transformation ● linking with identified sources of innovation ● linking organization with local service providers ● committee group formation/strengthening/leadership for effective organization and inclusively ● linkages with other farmer groups and organizations
Phase 4 Experimenting implementing actions and monitoring progress	● implementing and testing new ideas ● sharing experiences with the broader community ● monitoring of innovation process ● building networks
Phase 5 Reflection on lessons learnt and planning	● reviewing progress in organization capacities and innovations ● planning for next cycle

(2) Improving productivity of village livestock

This includes improvement of rangeland management, fodder production and productivity of village chicken. These activities aimed at improvement of productivity, as well as strengthening of capacity of farmers through their own try and error. They followed common process of intervention mentioned below. The activities started in 2005.

Situation Analysis

Interviews with key informants, LDA staff, livestock owners, municipal officers, and community meetings to seek collaborators were taken place. Technical interventions based on

chickens, fodder production and rangeland considerations were selected as priority area for further development of project activities.

Selection of communities

The team made preliminary selection of target communities based on the criteria set by the team, through discussions with livestock owners, LDA and municipal officers. Five potential villages were identified for further investigation. Selection criteria for target communities were:

- Interest of livestock owners are visible
- There is livestock owners associations
- BASED trained extension officers are available in the area
- Active Animal Health Officer is available in the area

Identification and formation of interest groups

Awareness meetings with broad community were conducted in the 5 potential villages and key people identified. Based on the meetings, special interest groups among the communities were formed according to the priority issues of the range land management, fodder production and village chicken. Respective committee was formed for each interest group. As a result, 17 interest groups were formed in 3 communities of Manganen, Mphanama and Strydkraal.

Problems and potentials identification and listing of possible activities of projects were discussed with interest groups, and lists of possible activities (training, exposure visits, and demonstrations) agreed with the groups with a commitment from the members to co-contribute to the cost and physical inputs of implementation of the activities.

Training and workshops

According to the plan prepared by the respective interest group, a number of activities including training, capacity building, exposure visits and establishment of demonstrations were implemented. Review sessions were conducted after every seminars and workshops for better understanding of gained knowledge and skills, as well as for information sharing with other farmers who could not participate in those events. Linkages to potential backup personal and groups – veterinary staff, technical specialists from LDA and ARC and other relevant support providers were also established.

Implementation of activities

Intervention of the team was rather frequent during the initial phase of the implementation, while as they became more experienced, the team tried to be more as a facilitator so that the interest groups will be able to find solutions by themselves. The team observed changes of the interest groups toward more independent and capable of organizing themselves.

Table 7.2-2Criteria used to monitor stages of livestock interest group development.

Stages	Interaction Pattern	Process and Focus	Communication
1	Randomness or leader-centered ;pairing and sub-grouping	Confusion; searching; protective and seeking allies	Guarded; constricted; topic and situation-centered
2	Erratic, tentative; usually leader-centered or leader-directed	Testing limits; seeking answers; trial balloon; leadership	Security-oriented; situation-centered; little self-disclosure
3	Erratic; centers on one person and/or pair, depending on issue; or random	Confrontation; hostile; anxious; conflict	One-way; distorted; labeling; some self-disclosure, usually in anger or retaliation
4	Less erratic; patterns develop; less centered on leader	Vacillate between task and group concerns; focus on new norms and personal feelings	Self-disclosure and feedback – more open and less labeling
5	Based on task at hand; usually work-dictated	Cooperation; group leadership; group is a *group*; **we** identify	Open, within limits of disclosure, feedback and intimacy norms
6	Group-centered but moving to individual in focus	I-Thou interaction often; intimacy norms changed to more intimacy	More self-disclosure and risk; positive feedback
7	Pattern appropriate to task; usually group-centered	Flexible; moves from task to person to group as appropriate	Open, constructive, accurate-based on *being* rather than needs

Monitoring of the activities

Monitoring of the activities was done in collaboration with the beneficiaries. Participatory monitoring and evaluation of all activities was achieved through regular reflection sessions whether issues being considered were organization or the potential benefits and risks associated with technical demonstrations. Within the time frame of the project, monitoring of group development was done according to criteria that reflected the stage of development of each livestock interest group. These criteria, applied subjectively, were used to assist the project managers to monitor progress and adjust activities according to the stage of development of the group (Table 7.2-2 above).

7.2.4 Achievements

(1) Component 1: Building capacity of livestock owner group

During the period of the project 17 interest groups with a total membership of over 200 livestock owners were formed. By the end of the period, these groups were all active although the groups were at various stages of "development". Some groups have formed a cohesive team that were able to meet independently, make decisions and diagnose and solve problems.

(2) Component 2: Building capacity of Extension and Animal Health officers

Capacity building focused on involving field staff meetings, workshops, field study, exposure visits and training during implementation. Particular effort was made to link extension staff to various stakeholders and potential resource people within the district, province and at a national level with specialists in ARC. Links were also established with the University of Limpopo and with other relevant livestock development projects in the region. Most relevant field staff did participate in some pilot activities. Once engaged, the field staffs were willing and capable, ready to learn and contribute their knowledge and experiences. Some staff members were afforded the opportunity to visit Japan and/or Mozambique.

However, overall, the pilot design expected that a greater response, commitment and involvement from the LDA field staff would be forthcoming, than was achieved. In general, field staffs were poorly managed, and their roles not clearly defined. For example, Municipal Animal Health Officers had limited involvement in the implementation of the pilot project since these officers perceive their job focus as disease control and surveillance with little or no responsibility for community development. The extension officers have a predominantly crop focus so beyond district office based livestock production staff, no municipal staff had a clear responsibility for working directly with livestock owners on livestock management issues. As a result, irregular participation meant that no field staff was able to full advantage of the opportunity to gain hands-on experience of the community mobilization processes.

(3) Component 3: Improvement of rangeland management

The demonstration site established by this component revealed that perennial palatable productive species still exist in the plant community in the degraded rangeland, although it dose not mean this project achieved any tangible improvement of productivity in the protected site.

Table 7.2-3 Species composition in the range land protection site

Ecological classification	Species	% of Composition	Total
Bare patches	None	27 %	**27 %**
Pioneer	Sedge	2 %	**47 %**
	Forbes	5 %	
	Aristida	37 %	
	Tragus	3 %	
Intermediate	*Eragrostis*	9 %	**11 %**
	Stipagrostis	2 %	
Climax	*Digitaria*	0,3 %	**14.3 %**
	Schmitia	14 %	

A vegetation survey conducted with the participated farmers during the project revealed that plan biomass of the site increased drastically to 850kg/ha from 100kg/ha. These species have survived and persisted where there has been some protection from grazing (usually under

hardy non palatable prickly bushes) by livestock. Summer resting of the rangeland from grazing will have a significant impact on the productivity of the rangeland plant species. Detail result of the vegetation survey is shown in Table 7.2-3 above.

(4) Component 4: Improvement of fodder production in the household patch.

The household fodder production demonstration showed that by using a systems approach involving appropriate water harvesting techniques, short season annuals and drought resistance perennials, a significant contribution can be made to household food security and livestock productivity, under the constraints of variable and low annual rainfall. For example, in 2004/5, despite a recorded annual rainfall at Mphanama was 170mm, farmers were able to harvest fresh plant material and seed for household consumption from short season annual crops such as cowpea and establish perennial plant and tress species such as Napier grass and Moringa. Water harvesting techniques used by the farmers were able to increase the effectiveness of rainfall through improving soil moisture levels and strategic watering to bridge periods of inadequate soil moisture during the growing season for about 4 weeks, and to extend the period of adequate soil moisture for plant growth.

The team investigated economic implication of this household patch fodder production, and found that it makes about net benefit of SAR 400 per year for a household (see Table 7.2-5). Absolute figure of SAR 400 seems not to be significant, however, given that only SAR 260 input is necessary to realize this benefit, and most of the input cost come from labor which actually not paid by the farmers, and also that this fodder production will enable to solve one of the most important problem of shortage of winter fodder for animals, it can be regarded as a remarkable result.

Table 7.2-4 Total input for production of cowpea

Input items	Unit and amount	Cost/crop
Seed	150 grams @ R7.50/kg	SAR 2.00
Compost	20 kg @ R 25	SAR 25.00
Labour - planting crop		
Dig and plant	2 hours @ R6/hour	SAR 12.00
Maintenance/weeding	1 hour per week @ R6/hour – 12 wks	SAR 72.00
Watering	1 hour per week @ R6/hour – 10 wks	SAR 60.00
Labour - water harvesting		
Dig hole	3 hours @ R6/hour - annual	SAR 18.00
Maintenance	0.5 hour/week @ R6/hour – 10 weeks	SAR 30.00
Cost of plastic sheeting	6 square metres – R90 –lasts two seasons	SAR 45.00
TOTAL		**SAR 264.00**

Table 7.2-5 Economic benefit of cowpea production

Output	Unit and amount	Income
Green leaves	30 litres @ R5/litre	SAR 150.00
Dried leaves	35 litres @ R 12.50/litre	SAR 438.00
Grain	10 kg @ R 7/kg	SAR 70.00
Stubble	10 kg @ R 2/kg	SAR 20.00
Total		SAR 678.00
Input		SAR 264.00
Net margin		**SAR 414.00**

(5) Component 5: Improvement of production of village chickens

This project verified that village poultry flocks with appropriate management can make a significant contribution to household food security, if mortalities due to disease and predators can be decreased. Detail result of production and economy of this project are shown in Table 7.2-6 and 7.2-7. The village chicken is productive and could contribute under low management systems SAR 4,000/annum for a flock of 10 hens and a cockerel. Input cost necessary to achieve this benefit was about SAR 4,000 per year. Among this cost, the largest portion is for labor (SAR 1,040) and for sunflower seed (SAR 3,878). Both can be self-supplied to reduce the actual expenditure, and increase the cash income.

Table 7.2-6 Improvement of production in village chicken component

Production character	Before the intervention	After the intervention
Clutches set/year	2	4
Egg production per year	1,000	1,300
Fertilised eggs	240	480
Unfertilised eggs	760	820
Chicks hatched	240	480
Survival 0 to 4 weeks	120	400
4 to 12 weeks	80	360
12 weeks to maturity	40	319

Table 7.2-7 Cost and benefit of improved village chicken production

Outputs	Before intervention	Improved management
Sale birds @ R30	SAR30.00	SAR30.00
Eggs @ 50c each	SAR 0.50	SAR 0.50
Income from sale of birds/year	SAR1,020.00	SAR 9,360.00
Income from sale of eggs/year	SAR 380.00	SAR 410.00
Manure 4 kg/bird/year @ Rand 1/kg	SAR 44.00	SAR 322.00
Total gross income	SAR 1 ,444.00	SAR 10,092.00
Input	SAR 416	SAR 6,040.00
Net Income/ 10 hens/year	**SAR 1,028.00**	**SAR 4,052.00**

Lessons for development of communal livestock in semi-arid area gained through implementation of this pilot project can be summarized as followings.

Intervention approach

- broad community consultation at project startup
- inclusiveness of intended beneficiaries in the planning phase
- beneficiaries are partners in the process, and intervention should be facilitation rather than directing or imposing
- knowledge generation with the beneficiaries, and building on existing knowledge
- understanding, recognizing and responding to real household circumstances
- continual reflection with the beneficiaries
- seek out collaborators and innovators, or leadership who have the respect and confidence of the community
- development of effective livestock interest groups
- be patient and wait for their understanding and ownership
- practical and pragmatic training applied in situ and knowledge sharing
- linking of informed people to share indigenous, provincial, national and international experiences
- networking of the interest groups with external knowledge and support services
- continual assess of the innovations by the beneficiaries

Type of activities

- build on existing enterprises, practices, resources and circumstances
- respond to expressed needs
- possible to be replicated within the capability (knowledge, assets, finance, infrastructure) of the community

Technology

- improving productivity of the rangeland through resting of the rangeland
- lowering annual food and forage production risk in the household plot by water harvesting and species selection
- use of high protein producing perennials as fodder banks and drought reserves
- housing, disease control and management of indigenous chicks

Support of LDA

- utilization of BASED trained staff
- clarification of roles and responsibilities
- ownership at district and sub district levels.

7.2.5 Evaluation results and the challenges for future activities

(1) Results of the evaluation

Table 7.2-8 in the next page shows comparison of the achievement mentioned in previous section and the original goals. This project achieved most of the original goal except an intermediate output of "More efficient government livestock extension services."

Table 7.2-8 Achievement of the Livestock Owner Group Support Project

Project Outline	Verifiable Indicators	Actual Achievement
Project Output More efficient and stabilized livestock production practices	Livestock productivity	New method introduced by this project improved productivity and efficiency of all the village chicken, range land vegetation and fodder crop.
Intermediate Output 1. More effective livestock associations	1. Ability to identify constraints to improving livestock production, and plan a series of strategies to address these constraints.	Most of the interest groups developed their capacity, and some of them are ready to be independent.
2. More efficient government livestock extension services	2-1. Ability to monitor and evaluate activities. 2-2.Research extension linkages established extension programs with participation and contribution of beneficiaries.	Some improvement in knowledge and skill can be expected, however, managerial skill and skills of participatory actions remain unchanged for most of the animal health and extension officers.
3. Livestock producers with improved knowledge and skills of livestock production and management.	3. Reduced mortalities, improved reproduction, and improved animal condition	This project realized lower mortality and improvement of reproduction for village chicken rearing. Also verified possibility of range land rehabilitation.

Through the participatory evaluation sessions, the team gained the following comments from the participated farmers.

Range land management demonstration

- delighted to see grass can grow above knee height
- impressed with amount of grass available for winter
- social mobilisation could achieve the same on all the grazing areas

Fodder production in household patch

- Cowpeas can be consumed as green spinach, dried leaves and grain
- Make a big difference to current diets
- Children do not just have to eat cold porridge at school
- Dried leaves can be conserved until late winter before it is consumed

Production of village chickens

- Training at ARC Irene brought valuable information to the village
- Proud of the personal empowerment
- Never realised the value and potential of village poultry
- Confident that village chickens has potential for commercialisation

(2) Challenges for future activities

Challenges of LDA

For the wider application of the approach used in this pilot project by the LDA, there are particular challenges to the LDA management and its extension officers. They include:

- application of a more production-focused approach and monitoring for human resource development of beneficiaries
- flexible implementation management to accommodate self pace of the beneficiaries
- time frame of more than 2 growing seasons
- preparation of action plan of extension and animal health officers to enable continuous input as facilitator for the beneficiaries

The approaches used in current centrally planned and input driven poverty alleviation and income generation projects cannot facilitate the approach taken by this pilot project. More over, it is in direct conflict with this more consultative and participatory approaches, causing confusion and uncertainty amongst both beneficiaries and LDA field staff. Importantly the success of wider application of the approach would require very strong commitment and support from provincial and district senior managers. Senior managers would need to be able to meet the challenge of balancing their continuing support for a complex, time consuming and resource demanding approach with the pragmatic imperative of managing the current top down

development approaches.

The LDA is continuing to invest in training staff under the BASED programme, which complements the approach taken by this project. However, a community wide mobilization approach is yet to be institutionalized within the LDA. If LDA cannot show a clear message to the beneficiaries and extension officers on the ground, investment for the BASED may not bear an expected fruit.

Challenges regarding the rangeland management

With appropriate management of grazing of the rangeland, these species could have a significant contribution to the plant of the rangeland. However, real impact of restricted grazing during a period of the year requires a medium term demonstration of 7 to 8 year. The process may be able to be speeded up by oversowing the rangeland with adopted species. Nevertheless, further promotion of construction of demonstration sites will be necessary to maintain the momentum created among the beneficiaries.

This project was primarily focused on physical protection of a rangeland. However, more fundamental constraints need to be addressed before these management practices have practical application within the current rangeland/livestock systems. How to reverse the decline within the context of commonly held ownership needs further investigation. Fencing extensive areas of rangeland will only have a beneficial impact on livestock production and rural livelihood if the rangeland is collectively managed properly. Fencing will change use pattern of rangeland for all the livestock owners in a community, and possible constraints and risk of the change and potential management mechanism which fits to the changes need to be explored.

Challenges regarding the fodder production

Further investigation of short season annual crops and the role of perennials - Moringa, Leuceana and Desmanthus – would be conducted with innovators. Mulching techniques – both plant and plastic – could be refined further.

Challenges regarding village chickens production

More investigation is required in the areas of:

- strategic feeding and linking production of feed in a household plot directly to poultry production
- Newcastle disease epidemiology has to be better defined to plan more effective vaccination programmes
- housing and creep feeding of chicks to increase survival rate

7.3 Community Forestry Project

7.3.1 Purpose of the project

The target area has an annual rainfall of only 400 – 500 mm and so it has poor vegetation. When it rains, the water is collected from vast area of uncovered land and causes a storm water, and this leads to soil erosion. This results in a vicious circle of more unprotected bare land, further degrading the water holding capacity of the soil, poorer vegetation and it has a negative impact on the amount of rainfall itself.

There are two major causes of this situation. One cause is that more people than ever are looking for firewood as a result of the increase in the population and they continue to log the remaining trees. The logging of trees outside of private properties is prohibited by law, but the reality is that poor people who do not have an alternative energy source are continuing to log trees for cooking, etc. Another cause is overgrazing by cattle and goats. Most of the land in the target area is communal land and it is under the management of traditional chiefs. However, there is no clear management rule on the grazing of livestock and so unlimited grazing has been carried on while the number of livestock has increased.

The vegetation in Sekhukhune was so devastated that it was unlikely to recover by itself even with some reduction in the pressures from logging and overgrazing which were the direct causes for the degradation. This was why the PRIDE Team determined that the community forestry project was indispensable in order to realize the sustainable development of the target area with the purpose of the afforestation of the area by tree plantation.

Forestry projects are long-term efforts. The biggest challenge is how to encourage poor people who are in the most need of short-term benefits to participate in tree planting which does not easily give them short-term benefits. Therefore, the effective strategy was to start an enterprise for the production of seedlings which can produce results in a relatively short amount of time when compared to the rest of the activities related to tree planting. In this way, the short-term benefits from the sale of the seedlings would work as an incentive for the afforestation activities which would need long time to take effect. Seedlings, of course, will be essential

Photo 7-3-1 Nursery: Firstly, fences were installed to prevent livestock from entering the nursery. Secondly, pillars were put up and the seedlings were covered with a shading net in order to alleviate excessive sunlight. Then, beds with a depth of about 10 cm were dug and pots made from plastic bags were put in to it in order to grow the seedlings. (Ga-Kopane village)

materials for the tree plantation activities in the later stages of this project, as well as working as an incentive for people to participate in the project.

With regard to the afforestation project itself, this project focused on visualizing the effect of afforestation by establishing a model woodland rehabilitation site with tree planting in an area of around 2 ha, because "seeing is believing." Of course, it goes without saying that planting trees on a mere 2 ha of land in the vast area of Sekhukhune is a drop in the ocean on its own. However, this project aimed for an educational effect by making this model woodland rehabilitation site because people have not clearly understood the necessity for afforestation and did not understand the meaning or effectiveness of afforestation. It was not practical to propose full-scale afforestation from the beginning in such a situation.

In this way, the "community forestry project" was launched as a pilot project, combining the nursery program (which creates short-term benefits) and the model woodland rehabilitation with tree planting, as well as some small-scale greening activities at schools and in individual house gardens. Initially, there was an idea that the model plantation could be designed so that the forest could be used as a commercial forest that as well as produces timber. However, it was found that the South African government was strictly regulating the planting of exotic species of tree such as eucalyptus which is valuable for timber. Therefore, it was decided to make the model by mainly working on rehabilitating the natural woodland by fencing the area, and by planting supplementary native species.

7.3.2 Input

The PRIDE Team provided the following materials to the two target groups mentioned below: pillar materials and shading net for constructing the nursery; various materials such as seeds, compost, river sand, plastic bags to grow the seedlings in, etc.; and tools such as hand shovels, wheelbarrows and watering pots. Pillars and steel wire for the fencing materials were provided in order to establish the model woodland rehabilitation site. In order to support the nursery program from the marketing side, as well as to promote the afforestation of the area at the same time, the PRIDE Team bought the seedlings produced at the nursery and donated them to the area through school afforestation projects, etc. The transfer of techniques for seedling production and afforestation to the group members was carried out by holding training sessions mainly conducted by the PRIDE Team and partly with the cooperation of technical experts from the Department of Water Affairs and Forestry as well as private companies. The two target groups mentioned below agreed to contribute to the input for the project. The group members actually provided all the labor for construction of the nursery, daily management work for the seedling production, construction of fences for establishing the model woodland rehabilitation site, etc.

7.3.3 Implementation process

The LDA did not have any personnel who were in charge of forestry. This project could not gain proactive cooperation from the Department of Water Affair and Forestry of the Limpopo province in the initial stages of the pilot project. Therefore, the PRIDE Team took the initiative and started to collect information in order to be able to select the target villages. Finally, Radingwana village and Ga-Kopane village were selected.

(1) Radingwana village

There were people who showed a strong interest in the forestry project in Radingwana village which had also been enthusiastic about the "0.1 ha integrated farming project." Considering this, as well as the fact that they had a relatively abundant water resource and that they had a very reliable leader made us decide to select Radingwana village as one of the target villages. The support from the community led by the traditional chief was also relatively solid.

(2) Ga-Kopane village

Ga-Kopane village is located on the Leolo mountain in the south-eastern part of the target area. It has a higher rainfall when compared to the other areas and so it is probably the only area in which the whole community is properly engaged in agriculture out of all the target areas. Although there are few areas in Sekhukhune where the people are enjoying a good natural environment, the people in Ga-Kopane village are all enjoying a rich natural environment. There are also people who have already started tree plantations individually in the village and so it was considered that there was a high possibility that the village people would understand the necessity of afforestation activities which aimed for the recovery of the natural forest. The area was at the riverhead of the Lepellane river and so it was thought that the recovery of the natural forest in this area would contribute to improving the water resources of the whole target area.

In May 2004, community meetings were held in the two target villages and the PRIDE Team explained the intension of the project to each community including its traditional chief and his staff. The meetings also asked them to select from the residents the people who would work on the nursery program to each community. Fifteen people in Radingwana village and seven people in Ga-Kopane village were selected and became members of the "nursery committee." Then, how to share the responsibilities and profits between the committee members and the whole community was discussed. The committee could not reach a conclusion on the latter point and decided to continue the discussions.

The nursery committee members started on the construction work for the nursery. The land chosen for the nursery was fenced off, then the pillars were put into place and the shading net was set up. This was followed by the digging of 20 or so beds, which are 1 m × 10 m and 10 cm in depth, for the seedlings. The seedlings would be put into these beds. The members

visited the nursery of the Department of Water Affairs and Forestry in Lebowagkomo and received technical guidance on seedling production from the staff there.

Tree species native to the area, such as marula, sausage tree, and acacia, were selected, as well as fruit trees such as mango, citrus, peach, guava, and papaya. From September 2004, they proceeded to put the soil mixed with compost and river sand into plastic bags, aiming at 18,000 bags in Radingwana and 7,000 bags in Ga-Kopane. They sowed the seeds in the culture soil that was in the plastic bags when they obtained each type of seed.

In mid-November 2004, a storm water hit the nursery in Radingwana and many of the seedlings which had just been planted became buried in soil. However, with the guidance of the PRIDE Team, the farmers dug out the plastic bags (pots) one by one and replanted the seedlings where it was necessary. After this was done, the seedlings recovered their original condition. There was no accident like this at Ga-Kopane.

Around this time, it was found that marula grew well in Radingwana. This showed that the native species were highly adaptable as was expected. However, despite the excellent growth of the native species, some members started to be skeptical about the possibility of selling the seedlings of the native species in the future, because they were common in the target area. The PRIDE Team made it clear that they would buy marula seedlings for use in the model woodland rehabilitation site for tree planting in order to dispel their concerns. The peach did well in Ga-Kopane where the climate is cooler compared to Radingwana.

With regard to the model woodland rehabilitation, the nursery committee members chose the sites with a land area of 2 ha in each village, after consulting with the traditional chiefs and the community residents. The research group and LDA had conducted the survey of the land by the end of 2004. However, there was no further activity for about six month after the turn of the year. The motivation of the members to do the work was reduced because of the influence of some members who thought that it would be impossible to sell the seedlings in the future, as mentioned above.

Photo 7-3-2 School greening day: children who took seedlings home for planting in their gardens after the greening event at school (Radingwana)

In June 2005, the greening day was held at the primary schools inside the target villages as a small-scale greening activity. This project asked them for their

cooperation in organizing the greening events by approaching the primary schools near to the nurseries beforehand. The primary schools in both Radingwana and Ga-Kopane willingly consented to our request. On the school greening day, the nursery committee members demonstrated to the children how to plant the seedlings. At the school events, all the children together planted the seedlings in the school grounds. The seedlings were the ones that the PRIDE Team had donated to the schools after they had been bought from the nurseries. This project also asked the children to take the seedlings home with them. This project encouraged them to plant the seedlings in their home gardens and grow them while taking good care of them.

Photo 7-3-3 Training in grafting: the nursery committee members learning grafting techniques from private nursery staff (Radingwana)

The construction of fences at the model woodland rehabilitation site started in Ga-Kopane in August 2005. The site for the model plantation was located on the mountain slope and materials for fencing had to be taken there manually. People in Radingwana also started transporting materials for the construction of the fence to their site.

Following the school greening day, the two groups strived for an expansion in the market for seedlings with the assistance of the PRIDE Team. For example, they asked the Department of Water Affairs and Forestry to use the seedlings for their afforestation event, as well as selling the seedlings at the monthly "market" which was set up at the pension pay-point. They tried various ways but they did not work well.

There was also the unsolved problem of the model woodland rehabilitation site. The problem was the relationship between the nursery committee members and the whole community. When the project started, the traditional chiefs and the community residents were in favor of the project, but then their interest quickly waned. This was probably because of the fact that there was no work to be done other than the nursery-related activities which were already being dealt with by the nursery committee members and so this project failed to have anything tangible to offer in order to keep the interest of the other residents. The establishment of the model rehabilitation site would need a lot of

Photo 7-3-4 Tree planting ceremony (Radingwana)

labor and it was desirable to have the whole community participate, but the nursery committee members thought that they had to do everything by themselves. This project initially was aiming for the promotion of afforestation within the whole community, but the participation of the communities in the scheme was low in reality.

In Radingwana, the delayed fencing work for the model woodland rehabilitation has finally completed in early 2006. The tree planting ceremony was held in February 2006. The ceremony was attended by about 50 people including the members of the nursery committee, the office staff of the traditional governing body, as well as teachers and students from the local primary school. The native species including marula were planted. Only 60 trees were planted at the ceremony due to the outgoing rainy season, but this project eventually succeeded in launching the model woodland rehabilitation which was a core part of the project. A year and eight months have passed since the project activity started.

Around this time, the technical training for grafting was held in Radingwana, which was free of charge and invited personnel from a private nursery company in order to improve the possibility for sales of the fruit trees. The private company personnel told us that the seedlings of native species like marula could be sold because a new law had been introduced obligating the afforestation of vacant mines after the land had been developed, by planting native species. Therefore, the personnel said, that there was a possibility of selling a large number of seedlings including marula for this purpose. The village members also succeeded in selling seedlings for the afforestation event organized by the Department of Water Affairs and Forestry in September 2006. This was the first case where the village members received a large order from a buyer other than the PRIDE Team. In this way, seedling sales in Radingwana progressed slowly.

On the other hand, Ga-Kopane faced extreme difficulties in selling seedlings because the village was located on a mountain where the transport of people and goods was very difficult. Because of that, the farmers who were participating in the nursery committee started loosing enthusiasm. The construction of the fence for the model woodland rehabilitation was also slow partly because of the physical adversity of working on steep mountain slopes. The motivation of the nursery committee members kept going down and some members chose to leave the mountain in order to work away from home. The management of the nursery gradually deteriorated from around June 2006.

7.3.4 Achievements

It became clear that the seedling production at nurseries by community groups was technically possible. However, marketing the seedlings was never easy. Table 7-3-1 shows how many seedlings from the nursery at Radingwana were actually sold. The table indicates the number

of seedlings sold and the sale price to each main customer[10]. The table shows that the PRIDE team virtually supported the community group by purchasing the seedlings for the first two years of the project, and then external sales finally started. Although it is not shown in the table, the nursery committee members continued to make efforts to sell the seedlings to individual consumers in many places from around June 2005 after the school greening day, but they hardly found any demand from individuals.

Table 7-3-1 Sales performance of seedlings from the nursery of Radingwana

Month/year	Customer	Intended use	No. of seedlings	Amount (SAR)
June 2005	PRIDE Team	School greening day	291	2,866
January 2006	PRIDE Team	Community greening	360	3,600
February 2006	PRIDE Team	Tree plantation ceremony for the model woodland rehabilitation	100	1,000
February 2006	PRIDE Team	Community greening	100	892
March 2006	PRIDE Team	Community greening	850	8,500
September 2006	Water Resource and Forestry Bureau	Afforestation activity	100	1,500
November 2006	Private company	Afforestation activity	Under negotiation	
Total			1801	18,358

The total sales had reached about SAR 18,000 for two years since the project started. How should it be interpreted? The average annual income in Sekhukhune in 2005 was about SAR 10,000, and so the total sales were almost twice as much as the average annual income. The amount of work done at the nursery in Radingwana could have been done using the labor of one family. However in reality, there were regularly eight or so nursery committee members involved, although there were some changes in the membership. Therefore, there was never a large amount of income as the share per person. However, the actual working hours per day at the nursery was not so long hours because the daily management work only involved the irrigation of the seedlings. When this is considered, the amount of income they gained was not low.

They hardly found any demand for seedlings from individual consumers, but it was found that there were possibilities for demand from government departments such as the Department of

[10] This table does not include the sales which were achieved at the pension disbursement point, etc. where only a handful of seedlings each were sold.

Water Affairs and Forestry as well as demand created by the compulsory afforestation which was imposed on the mining companies, etc. The group in Radingwana succeeded in selling the seedlings to the Department of Water Affairs and Forestry, and is in the process of negotiating with a private company to sell the seedlings. (The group in Ga-Kopane village could not get to this stage.)

The goal of the project for seedling production which was set at the beginning of the project was that "the nursery would be established and function." The indicators for the achievement of this goal were that "90,000 seedlings would be produced at the nursery and planted on private properties and schools," and that "the survival rate of the seedlings would be 60% or more." The actual amount of production was far smaller than the intended 90,000 seedlings. However, the planted seedlings generally grew well, although some of them took longer to germinate, and the survival rate of the seedlings certainly reached the goal of 60% or more. The mid-term goal was that "two nurseries would be newly established" and this goal was achieved. To summarize, the large-boned plan that the nursery would be managed by the community group and start functioning was realized.

The goal for the model woodland rehabilitation set at the beginning of the project was that "the deteriorated community land would completely recover its vegetation and would have sufficient forest density." Radingwana completed construction of the fence and planted the seedlings that they had produced. Ga-Kopane started construction of the fence, but stopped their activities before the fence was completed. They did not get to the planting stage. The conclusion was that the goal set at the beginning was too high and neither Ga-Kopane nor Radingwana (which managed to launch the model tree plantation) achieved the goal. To summarize, the achievement was that this project got to the stage where one site out of the two had launched the model woodland rehabilitation.

With regard to the small-scale greening activities, the greening day was held at the primary schools in the two areas. This activity asked the children to take the seedlings home and guided them on how to plant the seedlings in their home gardens. This activity also donated the seedlings to the farmers who participated the "0.1 ha integrated farming project" and had them plant the seedlings on their farmland. This activity did not follow up what happened to the seedlings at each household after the greening day. There were problems with the seedlings planted on the grounds of the primary schools, which included goats entering the planted area and eating the buds during the summer vacation when nobody was managing the site. On the other hand, the peach seedlings, etc., which were planted in Marulaneng (one of the participating villages in the 0.1 ha integrated farming project), have grown to about 1.5 meters in height as of October 2006. It seems that the seedlings are growing well in cases where the seedlings were managed well, including irrigation and installation of a protective fence to stop attacks by livestock, in the early stages after planting.

Table 7-3-2 summarizes the results of the project activities in the two target villages.

Table 7-3-2 Achievement in the two target villages

	Nursery program	Model woodland rehabilitation	Small-scale greening
Radingwana	They succeeded in continuous production of the fruit tree seedlings as well as for the native species including marula, moringa, citrus, sausage tree, acacia, etc. As for the sale of the seedlings, there was little demand for the seedlings from individual people. The motivation of the nursery committee members was maintained by the research group purchasing the seedlings, and the members also managed to sell the seedlings to the Water Resource and Forestry Bureau two years after the project started. Selling a constant amount of seedlings to mining companies has also become a possibility.	The 2 ha of land on which the vegetation had severely deteriorated was selected with the consent of the community. The nursery committee members provided the labor to fence the land and they planted seedlings which had been grown in the nursery. An issue for the future will be maintenance of the land such as the restoration of broken fences, as well as additional tree planting.	The school greening day was held once, with the cooperation of the local primary school. On the greening day, the children planted trees on the school ground as well as taking seedlings home to plant in their home gardens. The participants in the 0.1 ha combined farming project also planted the seedlings around their farmland.
Ga-Kopane	They succeeded in the continuous production of the fruit tree seedlings and also the native species including peach, marula, moringa, coral tree, guava, etc. However, in terms of sales, the village was in a difficult location to be accessed (on the plateau) and this became a problem. The participants on the nursery committee gradually lost their motivation because they could not find customers other than the research group, and they eventually stopped the nursery activities as well.	The 2 ha of land was selected with the consent of the community and construction of the fence started. However, there was a lot of difficulty in transporting the materials due to the mountainous topography. It was not possible to find a way to sell the seedlings. Under such conditions, the members gradually lost their motivation and eventually stopped the activity altogether.	The school greening day was held once, with the cooperation of the primary school next to the nursery. On the greening day, the children planted trees on the school ground as well as taking seedlings home to plant in their home gardens. The seedlings of native species, which were planned to be planted in the model tree plantation site, were donated to the community residents. We asked for the cooperation of the traditional chief and the seedlings were planted on each resident's land through the initiative of the chief.

7.3.5 Evaluation results and the challenges for future activities

Considering the effectiveness of the initial idea of the pilot project which is to popularize tree planting for vegetation recovery using the incentive of economic activity at a nursery, the

following points became clear. (1) It is technically possible for the community group to produce seedlings in the nursery. (2) However, it took more than two years to grow the seedlings to a size which the market required. (3) There is little demand from the private sector within the community. (4) There is still potential to exploit the demand from the public sector and the private sector outside the community, such as that from mining companies. However, exploiting such sectors would require relatively high skills for the marketing activities. When taking into consideration that this project is targeting a poor population who are not experienced in business, this project found that the development of the nursery program would face a lot of difficulty in finding markets to sell the seedlings. Therefore, our conclusion is that it is difficult to give people incentives to participate in tree plantation for vegetation recovery by using the nursery program. When the efficiency of vegetation recovery is considered, it would be necessary to promote afforestation program with initiatives from the government, who would buy the seedlings, pay the wages for the plantation labor and combine other economic benefits with afforestation. However, if the above-mentioned point (4) is appropriately supported, i.e., if the marketing for the demand from the public sector and the large-scale private sector is appropriately supported, this set of models of nursery and afforestation on a community basis could become effective.

The future challenge for the nursery committee in Radingwana village is to succeed in the negotiation for sales of indigenous species seedlings with a private company and open a market for large orders. Having even one large order would make it easier to move to the next stage of development. Similar amounts of demand for indigenous species seedlings exists in different areas, and so it is important, by accumulating sales of seedlings, to inform people that they can purchase indigenous species seedlings anytime they come to Radingwana. It takes a year or two for even the indigenous species seedlings to grow to a marketable size, and so Radingwana should not forget that they are ahead of their competitors by a year or two. Therefore, next year will be an important period in establishing relationships with their customers.

Our expectation for the future is that the nursery committee members of Radingwana will recover their interest in community afforestation as the nursery program expands. Presently, the model woodland rehabilitation site has been invaded by goats, etc., because of gaps in the fencing. Reinforcement of the fence is an urgent task in order to protect the seedlings of marula, etc., from being damaged by livestock, after all the work that had been done to plant them. The nursery committee members already have the materials needed for the reinforcement. The PRIDE Team is urging the members of the nursery committee to conduct the reinforcement work.

7.4 Practical Farmer Training Project

7.4.1 Purpose of the project

Although few in number, there are “emerging farmers” in the target area who are experienced, have a relatively large-scale farm and an entrepreneurial spirit. Supporting and fostering these emerging farmers and their successors is very important for agricultural development in the target area. However, the young people who would inherit these farms are generally uninterested in farming, and even those who are interested have very few opportunities to learn agricultural technologies.

Accordingly, the ultimate goal of the “Practical Training for Farmers Project” are to (1) increase the number of emerging farmers, (2) improve the agricultural techniques of young people and (3) promote the exchange of technology among emerging farmers. The direct purpose of this project is to establish a new system for agricultural training and ensure that many young people in the target area receive this new agricultural training. The project's training is distinctive in four ways.

（1） It prioritizes young people that are very likely to farm in the future.

（2） The basic concepts are “learn on site” and “technology transfer between farmers”.

（3） In the practical training for farmers, the trainees farm on the scale that will be feasible in the future and

（4） The farmers taking on trainees provide a site for their practical learning experiences as the trainees' “mentor farmers.”

The training can be broken down into three parts.

Part 1: Selection of trainees

Part 2: Practical farm training (six months)

Part 3:Training at the Tompi Seleka Agricultural Training Center (hereinafter, “Training Center”) (three months)

7.4.2 Input

(1) Materials: Rubber hip boots and calculators for trainees

(2) Other expenses: Cost of recruiting trainees, Cost of practical training for farmers, Training Center training costs

(3) Personnel: Sekhukhune District office project coordinator, Mentor farmers, Training Center instructors

7.4.3 Process of implementation

The activities were carried out in the following order:

（1） Selection of farmers to accept trainees (mentor farmers)

（2） Selection of trainees

（3） Practical agricultural training

（4） Training at the Training Center

（5） Second training cycle

（1）Selection of farmers to accept trainees (mentor farmers)

Mentor farmers were selected between May and June 2004 with the help of extension officers of Sekhukhune district. The team visited the candidates and examined the mentor farmers' crops, field size, their farming method and their experiences thus far. The team gave them an overview of the "Practical Farmer Training Project," explained the objectives and discussed with the farmers the possible compensation they might awarded for taking on trainees. Six farmers listed below were selected through this process (three farmers in Fetakgomo and three in Makhuduthamaga).Most of the mentor farmers are proud of their experience and their success as independent farmers, and they seemed motivated to help young people in the target area by participating in this project.

Table 7.4-1 Selected "mentor farmers"

Farmer and group name	Location	Overview
Mr. John Mabota (Independent farmer)	Apel, Fetakgomo	10 ha in cultivated acreage; has grown cabbage and oranges since 1999; uses water from a well.
Ms. G.M. Thobejane (Independent farmer)	Mohlaletsi, Fetakgomo	0.7 ha in cultivated acreage; has grown tomatoes, spinach, onions, carrots and sugar cane since 1998; uses water from a well.
Kopano ke Matla (Group)	Ga-Nkwan, Fetakgomo	11 ha in cultivated acreage; has grown tomatoes and sweet potatoes since 2002; uses water from a well.
Mr. Lucas Kgoale (Independent farmer)	Tjatane, Makhuduthamaga	9 ha in cultivated acreage; has grown cabbage, onions, tomatoes and paprika since 1993; uses water from a well; is currently expanding farmland.
Mr. Mariri (Independent farmer)	Madibong, Makhuduthamaga	11 ha in cultivated acreage; grows tomatoes and cabbage; uses water from a well.
Moratsele Multi Purpose Project (Group)	Moratsele, Makhuduthamaga	0.5 ha in cultivated acreage; has grown tomatoes, onions, spinach, chilies, and red beets since 1986; uses water from a well.

After the mentor farmers are selected, the team considered the schedule and content of the practical training, and decided that the practical training would focus on: 1) preparation of agricultural field, 2) preparation of nursery garden, 3) transplantation of seedlings, 4) plant spacing, 5) agricultural field management, 6) fertilization and pest control, 7) pest identification, 8) handling of agricultural chemicals, 9) significance and methods of crop rotation, and 10) harvesting and post-harvest processing. Also, in addition to agricultural techniques mentioned above, the training emphasized the importance of the mentor farmers sharing their own experiences in establishing and managing farms with the trainees. Since this was the first time for most of the mentor farmers to work as instructors, LDA took the lead in preparing a training curriculum.

（2）Selection of trainees

Before selecting the trainees, selection criteria was set. Given the project's objective to foster motivated young people to take over the region's agriculture, the target age group was set at from18 to 24. Another criterion for their selection was the availability of farmland and a water source, since the trainees were expected to begin farming after the training was completed. In addition, the trainees would not receive any wages or compensation from the project, and would have to pay for their food and transportation costs themselves during the training. The extension officers publicized the information on the recruitment in the various communities in the target area.

Thanks to the efforts of the agriculture extension officers, about 80 people applied to the program in Fetakgomo, demonstrating that many young people are highly motivated but lack opportunities for training. In Makhuduthamaga, the local agricultural cooperative expressed interest in this project, and several young members were candidates. In addition, many high school students applied, but had to be turned down as they would not be able to participate the training without suspending schools. Conversely, there were a very high number of applicants over the age of 25, the maximum age under the selection criteria. In this case, applicants who were deemed to be extremely motivated to farm were ultimately included in the selection process regardless of age. The overall trend among applicants demonstrated that interest in agriculture was more widespread among young people than the team had anticipated. Further, many applicants had agricultural experience, and several applicants had received training at the Training Center.

Because of this larger number of applicants than expected, the team thoroughly discussed with

the 6 mentor farmers, and agreed that each mentor farmer would take on more trainees. Ultimately, there were a total of about 40 trainees, with each mentor farmer taking on a minimum of 4 and a maximum of 7 trainees depending on their capacity and the candidates' abilities.

（3）Practical agricultural training

The practical training began at the end of August 2004 with the start of the Moratsele Multi Purpose Project in Makhuduthamaga. Both the mentor farmers and the trainees had been anticipating the training with high spirits, but problems broke out among both parties shortly after the project started. The farmers were uncertain as to how best to provide training, and the trainees did not have a clear idea about the kind of training they would receive and how they should approach the training. To address this situation, the team and the extension officers repeatedly explained to the mentor farmers that it was important for the trainees to gain practical experience with agricultural techniques based on the actual planting schedule, and emphasized to the trainees the importance of hands-on experience with agricultural technology. After repeated trial-and-error, the mentor farmers gradually became accustomed to teaching and the trainees to firsthand experience, and the practical training progressed smoothly.

Some of the mentor farmers ran into a more serious problem. In the Moratsele Multi Purpose Project, a pump used to draw water from a borehole broke down. The farmers borrowed a pump from a neighboring farmer to continue their farm work, but it became a severe obstacle for providing practical training.

Another major problem was monitoring of the practical training. The extension officers who were supposed to support the mentor farmers and trainees on a regular basis were unable to visit the mentor farmers regularly due to overlapping duties, so monitoring was insufficient. As a result, farmers did not receive the necessary technical support, and trainees' motivation was also injured. This situation was ameliorated when the team and the Sekhukhune district office project coordinator persuaded the extension officers to continue the monitoring, but a full resolution of this problem would require the formulation of an appropriate activity plan for LDA and extension officers, as well as a reformulation of the system for managing its implementation. This is by no means a problem that can be easily resolved.

（4）Training at the Tompi Seleka Agricultural Training Center

After the practical training, formal training was held at the Tompi Seleka Agricultural Training

Center for approximately three months. This training covered preparation of agricultural fields, irrigation, formulation of farming plans and planting techniques. The initial plan had assumed that only the trainees rated highly in the previous practical training would be invited to the Training Center training, but in the end, all the 18 trainees that had completed the difficult practical training without dropping out were accepted.

In the final stage of this training, the trainees were taken on a field trip to visit a group of farmers involved in "0.1ha Integrated Farming Project." The intention was to mutually reinforce the effects of this project with another pilot project. On this field trip, the trainees brushed up on the agricultural techniques they had learned in their training, and were given a new opportunity to learn a different scale and type of agricultural technology. At the closing ceremony of the training held on the final day of the field trip, all of the trainees received a certificate of completion.

Based on the first year's experience, the team compiled a "Training Operation Manual" that is to be a practical guide for LDA in independently implementing this training in the future.

（5）Activities in the second year

After the first year's training was completed, Sekhukhune district office began preparing for the second year's cycle based on the above-mentioned Training Operation Manual. In the second year, the team decided to play a supporting role and let the Sekhukhune district office take the lead in the preparation and operation of the training program. First, the team visited the 6 mentor farmers to inquire as to whether they would be willing to continue their cooperation. Three of the 6 farmers agreed, and each of these would take 5 or 6 new trainees. Trainees began to be recruited in July 2005, and ultimately 21 trainees were selected.

The practical training for the second year began gradually in September 2005, and went smoothly for 2 mentor farmers due to their experience in the previous fiscal year. However, the other farmer was skeptical of LDA's commitment to the project because of insufficient monitoring of the training by LDA in the previous fiscal year, and this farmer discontinued his training. The Training Center's system for implementing training had changed and it was unable to take on a large number of trainees in one period. As a result, the trainees were not accepted at the same time after completing their practical training, but a few at a time in stages.

Originally, preparation for the third year's training was supposed to begin in the latter half of the

second year. But no preparation has begun as of February 2007.

7.4.4 Achievements

（1） Training program graduates

18 trainees in the first year finished the entire training program, and 20 in the second year finished the practical training. It became clear that, contrary to the popular belief, many young people in the area had a keen interest in agriculture. Further, 6 of the graduates in the first year were chosen to participate in the “0.1ha Integrated Farming Project”. Most of these 6 began to achieve tangible results by using the knowledge and technology acquired through the training project.

（2） Formation of new training program

The structure whereby local farmers teach young people about agricultural technology (farmer to farmer), these youth learned while practicing (learning on site) and practical training is provided in affiliation with a formal training organization is completely a new idea. This project proved the potential and effectiveness of this structure for training. Also, the mentor farmers that participated in this project could serve as important partners for LDA in providing agricultural training and disseminating agricultural technology in the future.

（3） Manual for training operations

When the first year activities were over, the team and the Sekhukhune district office prepared the “Training Operation Manual for the Practical Farmer Training Programme” based on the lessons that had been learned thus far. This manual was distributed to those involved with the project. (See the supplementary volume of this report for details.)

7.4.5 Evaluation results and challenges for future activities

(1) Evaluation results

Table 7.4-2 shows a comparison of this project’s objective at the planning stage and the actual outputs.

Table 7.4-2 Planned objectives and actual achievement of Practical Farmer Training Project

Level of objective	Content	Indicator	Achievement
Project objective	New training implementation system established. Youths in target area receive training under new system.	At least 5 training graduates a year start farming.	Among 1st year training graduates, 6 began small-scale diversified farming. None among 2nd year training graduates did so.
Outputs in the intermediate stage in the project implementation period	New training program made (ways to devise program to be accumulated in farm office); improvement in young people's techniques	New training program is to be better than existing one and improve reputation in agricultural college and practical farm training.	Interviews with those who completed training indicate high marks for contents of training. But it is not yet established as program.

The following are summaries on the results of the participatory evaluation with the ex-trainees of the first year and the second year, respectively. The evaluation topic covered the effectiveness of the practical training for farmers, the effectiveness of the training program as a whole, and problems in the training.

Effectiveness of the practical training for farmers

Most training graduates rated the practical training with mentor farmers as very effective. The following are some of their views.

- "I was able to deepen my understanding of farming through guidance and practical training in farm work."
- "We learned all the steps from farm field preparation to harvesting."
- "Mentor farmers were enthusiastic about sharing their know-how and experience, and their guidance was superb."
- "It was good to learn from other trainees."

These views confirm that the basic concept of practical training, i.e., learning on site and disseminating knowledge from farmer to farmer, was appropriate. In addition, generating a sense of camaraderie and competition through group learning, which had been unexpected, also enhanced the effectiveness of practical training.

Effectiveness of the training program as a whole

In addition to the practical training, both the training in the Training Center and the study tour received high marks. Training graduates also rated highly the training methodology of learning

theory at the Training Center after experiencing a series of farming techniques in the practical training with mentor farmers. Many training graduates stated that they gained confidence in their farming skills through this project.

When asked whether this project should continue the existing training methodology (practical training, training at the Training Center, and study tour), almost all the training graduates said it should.

Problems

The followings are the major problems cited by the ex-trainees.

1. On practical training with mentor farmers
   - "Expense for transportation and lunch was a major burden."
   - "There was little monitoring by extension officers, which made us discouraged."
2. On training in the Training Center
   - "I was worried because there was no clear explanation on exactly when the training would begin."
   - "The training would have been better if we could learn about poultry farming, water harvesting, and farm management."
   - "There should be follow-up support for us to start farming after we finish the training."

Of all the problems cited by the training graduates, the most serious ones are lack of the Department of Agriculture's management capacity and lack of follow-up support to training graduates. The section below on unresolved issues elaborates on them.

(2) Challenges for further activities

LDA's management capacity

Although the manual was listed as one of the output at the beginning of this section, LDA's inadequate management capacity and the extension officers' unsystematic monitoring are still major issues. In the second year, the Sekhukhune district office took the lead in implementing the activities but the project coordinator of Sekhukhune district office and the team were the ones who actually visiting the farmers regularly and monitoring the trainees. The extension officers failed to build good relationships with the mentor farmers and trainees and created distrusting atmosphere in the mentor farmers and trainees, which lowered their interest in the training. The extension officers' problem was essentially rooted in LDA's lack of management capacity.

Follow-up support for training graduates

One of the problems with the pilot project's design is related to the follow-up support for the graduates. The initial Project Purpose was as follows: among those who complete the training, 5 will start farming. However, this project is actually limited to training only, and does not include support once the trainee actually begins farming. In hindsight, it was much too optimistic to expect that some young people with no farming experience would start farming once trained. In fact, with the exception of the 6 trainees who received support in the 0.1ha Integrated Farming Project, no trainee has ever started farming.

This issue points to a fundamental problem: when helping the poor, they need both technological and material support. For instance, the debate over the "micro credit" holds that financial help alone is insufficient and that it should be accompanied by related technological support and aid in business management. This project shows the opposite to be true in technical training assistance as well. Luckily, LDA has CASP (Comprehensive Agricultural Support Program), a scheme for providing financial support for agriculture-related infrastructure. It would be worthwhile to consider combining an effective training program with CASP.

Benefits for mentor farmers

This project considered various benefits for the mentor farmers that cooperated with the project by volunteering to take on trainees for the practical training. Such benefits could include preferential technological aid from LDA, undergoing the agricultural training of their choice at the Training Center, the introduction of an accreditation system to publicly recognize good farmers, and concession of favorable conditions for small-scale loans. Although the team suggested these ideas to LDA, unfortunately, they were not implemented during the project period. It is worth considering ways of making the mentor farmers the official "partners" in agriculture extension and ensuring that they benefit from this scheme.

7.5 Women Businesses Promotion Project

7.5.1 Purpose of the project

The overall objective of the Women Business Promotion Project is to stimulate business activities in the target area, and to achieve improvements in the local inhabitants' livelihood. The project aims to prove the validity of a small-scale enterprise model using local resources

and to establish mechanisms for the extension of the model within the target area. Expected outcomes include the development of several target groups into small-scale business entities who can share their experience and knowledge with other potential groups.

The basic strategies are as follows.

1. Assistance focuses on selected model groups as partners sharing their experience with the small-scale enterprise model.
2. Model group activities are publicized using the "Mobile Information Unit" in order to find potential groups with an interest in the small-scale enterprise model.
3. Model groups implement technology extension workshops for such new groups.
4. Support for model group activities is given in parallel with support for the initiation and sustainable operation of small-scale enterprises by new groups.

7.5.2 Input

The inputs to this project are as follows.

(1)	Equipment and facilities:	Bread-baking facilities for model groups
(2)	Materials:	Bread ingredients (for model groups and new groups), Bread pans (for model groups), Ingredients for new product development, Equipment and materials for extension workshops (plastic bags for bread, extension materials)
(3)	Other expenses:	Transportation expenses to extension workshops, vehicle rental and maintenance
(4)	Human resources:	Bakery specialists (Bread-baking technology training for model groups)

7.5.3 Process of implementation

(1) First year

During the first year of the project (FY2004), model groups were selected from the target area, and were offered intensive assistance in order to enable them to become partners who could disseminate their experience with the small-scale enterprise model. The following two groups in the Fetakgomo Municipality were designated as model groups.

- Arejeng Baroka Bakery, Ga-Seroka Village
- Makupye Bakery Project, Ga-Nchabeleng Village

The Arejeng Baroka Bakery (hereinafter referred to as Arejeng) consists of 18 members, of which 16 are women and 2 men. The Makupye Bakery Project (hereinafter referred to as Makupye) consists of 15 members, all of whom are women. Both groups had been engaged in the bread-baking business using traditional mud furnaces.

Reconsideration of group organizational structure

The first step the team took was to grasp the profit structures of the two groups and to analyze their organizational structures. More specifically, detailed information obtained from each group was used in order to reconsider and mainstream managerial tasks within each group's committee (chairperson, secretary, receiver, purchaser, etc.). This not only gave group members a more accurate understanding of the functions each position entailed, but also made it easier for them to perform their roles.

Construction of bread-baking facilities

The Arejeng already had a plan to build a new, resistant bakery facility, and the team supported for the construction of a tin-roofed brick oven. During the facility construction process, particular attention was given to maintaining group ownership. This was achieved by discussing how to hold down construction costs, and how the cost burden could be shared between the team and the group. As a result, the team contributed SAR 20,000, while the group provided about SAR 30,000, as well as labor to help reduce costs.

Construction works for the new bread-baking facilities were completed in the end of September 2004, and both groups embarked on test baking. As firewood necessary for operating ovens became scarce in the Ga-Seroka area where Arejeng is located, coal was considered as a possible alternative fuel. Nevertheless, the high procurement cost of coal and the difficulty of adjusting its heating power, finally made the group agree on continuing to use firewood. As the result of such a trial and error process, both groups got used to the operation of the new facilities and by April 2005, production was carried out without major problems.

Strengthening business skills

Along with the construction of bread-baking facilities, the team focused its support on strengthening the technical and business skills of the two groups. Two-day training workshops were conducted in Arejeng and Makupye in February and October 2004 respectively. An instructor was invited from Anchor Yeast, a bread-making company in Johannesburg. The training emphasized the importance of improving the group members' business skills, as well

as that of product diversification. After training, the Arejeng group introduced new products such as pastry and bread rolls, and significantly increased their sales through marketing to local school students and their mothers. This case demonstrates how small-scale businesses can also benefit from product diversification. Besides the bread-baking workshop, an account management workshop was conducted in order to foster the members' awareness of the importance of account management.

(2) Second year

In the second year, the team set out to expand the small-scale enterprise model centered on the two model groups. This was realized through technology extension workshops carried out by the Arejeng and Makupye model groups and targeting those new groups who expressed their interest in the bread-baking business. In order to recruit new groups, the team made use of another pilot project of "Mobile Information Unit," making information available at pension-pay-points and various event sites. The following eight groups responded to this publicity and attended the workshops for the extension of bread-baking technology.

Table 7.5-1 New groups participated in the Women Business Promotion Project

Fetakgomo Local Municipality	Lapa ga le je le leugwe old age club, Strydkraal
	Mashilabela Youth Bakery project, Mashilabela
Makhuduthamanga Local Municipality	Gaatan Bakery project, Mphane
	Mashabela Bakery project, Mashabela
	Basadi tiang mathla Bakery project, Phokowane
	Makgoabe Bakery project, Makgoabe
	Thusanang Tswaing Club, Tswaing
	Glein Cowie Bakery project, Glein Cowie

* Glein Cowie stopped its activities after attending the workshop, due to insufficient membership.

Workshops for the extension of bread-baking technology

The new groups were invited to Arejeng and Makupye to attend the workshops for the extension of baking technology, where they learned about the manufacturing process from the model groups, and actually took part in baking activities. Arejeng conducted workshops for 5 of the abovementioned 8 groups, while Makupye took charge of 3. Furthermore, cooperation and participation in each other's workshops also contributed to increasing technical exchange between the two model groups.

Improvement of mud oven

The technology extension workshops included explanations of manufacturing processes for both tin-roofed brick oven and traditional oven made of mud and cow dung. Since new groups could not rely on sufficient capital for initial investment, they decided to kick off activities by building a traditional oven. With further support and guidance from the two model groups, all the new groups were able to complete the construction of their mud ovens. Unfortunately, most mud ovens were destroyed by heavy rains in February 2006. Under such circumstances, the team recommended the rectangular-shaped oven used in Arejeng. A rectangular oven not only was less vulnerable to the vicissitudes of weather than a round-shaped one, but it also presented other advantages. For example, the team noticed that the interior walls of a rectangular oven were less likely to be damaged by heat, which reduced the risk of wall fragments falling on the bread. Thus, all the new groups set up rectangular ovens and became able to ensure stable production.

Marketing support

While the use of rectangular ovens served to achieve production stability, new groups also improved their marketing methods by trial and error. At the beginning, their sales were targeted at members of their own community, who had previously purchased bread from neighborhood stores. Good-quality bread, carefully baked in traditional ovens attracted a large number of customers, and sales to community members rose steadily. In particular, the Gaatan Bakery project (hereinafter referred to as Gaatan) had to increase production from one to two cycles per day, doubling the amount of manufactured units in order to meet the demands of the numerous local populations. Adding more ovens would have been another option, but considering the high cost of the bread pans necessary for baking, and the group's still low capital accumulation, increasing operating time was a more realistic choice.

The Mashabela Bakery Project (hereinafter referred to as Mashabela) succeeded in attracting new customers when they started producing doughnuts in response to requests from regular clients. Doughnut production techniques were transmitted through workshops from Mashabela

to Gaatan, where doughnut sales figures soon became comparable to those of bread sales. While individual sales within communities delivered satisfactory results, almost all groups ventured into collective sales at pension-pay-points and other local markets. Although lacking significant price competitiveness with mass-produced bread, their major competitor product, the “healthy” and “natural” quality of bread and doughnuts baked in traditional ovens proved popular with customers. In addition, the Mashabela Youth Bakery Project successfully concluded a contract to supply neighborhood schools with bread for school meals. Although the stable supply of good-quality bread in large amounts poses a number of challenges to groups whose production is still affected by managerial factors and changes in oven condition, such marketing forms have a significant potential for the future.

Assistance for strengthening organizational and managerial practices

The necessity of adequate organizational and managerial practices in business has also been emphasized since the initial stage of activities with new groups. Bread-baking and marketing skills can only serve to achieve temporary sales results, but not to ensure the sustainability of business activities. Therefore, it is essential to take further steps such as regularizing group meetings, clarifying task division and ensuring accounting transparency (bookkeeping, receipt management, etc.). Moreover, such information should not be monopolized by a particular leader, but shared by all the group members. Everyone’s agreement on how decisions are made and how operations are carried out and managed is essential for sustainable organizational management. The team provided constant monitoring and support to all the groups in order to strengthen such organizational and managerial skills.

Preparing for the end of the assistance

Starting in October 2006, the team notified the end of the assistance to the respective target groups, and, as a final step, devised with them post-assistance activity plans. With regard to the plans, the team and the target groups discussed many issues such as increasing bread production, expansion of sales networks, and introduction of new products. This pilot project’s impact manifested itself in the very fact that the women who had had no previous business experience raised such detailed and enthusiastic future plans. The following are some of the future plans discussed with the target groups.

- Begin selling bread in the morning in addition to lunchtime.
- Produce bread twice a day instead of once.
- By contract, start providing bread to neighboring elementary schools on a regular basis.
- Produce and sell new products such as sweet pastries and biscuits.
- Sell tea in addition to bread.

In search of successors

The team believes that small business development is very important for helping the poor help themselves, which is the objective of this study. But LDA has no section that deals with livelihood improvement activities other than agriculture, and is unable to take over the small business development activities. The team got in touch with Department of Health and Social Development (DHSD, former Department of Health and Welfare) and considered having it take over the activities. DHSD had a scheme to provide funds to group activities, and the team thought that it might be able to use the scheme for livelihood improvement activities. However, this scheme is to provide a large amount of money at once, which is unsuitable for disseminating and enhancing the model that this project tested. The model is to provide small amounts of money to activities as they proceed while providing technical assistance in a sustainable manner. Thus the team, based on the experience of this project, prepared a proposal summarizing a business model and external support necessary for it. This proposal (please see the supplementary volume to this report) is meant to be a manual for developing small bakery businesses from now on. In November 2006, the team discussed the proposal with the Senior Manager of the Community Development section of the DHSD. Fortunately, they took a high level of interest in the proposal and a desire to consider detailed steps to implement it.

7.5.4 Achievements

(1) Target group autonomy

The first achievement of the project is represented by the fact that, after having successfully put their bread-baking business on track, most target groups, including Arejeng and Makupye, are becoming autonomous. While the meaning of “autonomy” differs according to the group, it refers basically to the capacity of sustaining the baking business on their own, without the team’s assistance. In terms of production, they have become capable of stably producing good-quality bread and doughnuts using traditional ovens. From a marketing perspective, they have been able to attract individual customers both within their own communities and at the local markets held at pension-pay-points, at the same time accumulating experience that later

will enable them to engage in contract sales. Through the practice of bread baking, target groups have acquired a new source of income. Yet, an even more important achievement is that the group members have boosted their confidence and have given them a concrete “image” of what business management is by accumulating small success experiences in their bread-baking business. Moreover, it has been confirmed that many group members feel that they are serving a useful purpose to their community through baking.

(2) Establishment of a small-scale enterprise model

Through the support given to the 2 model groups and 7 new groups engaged in the bread-baking business, the team has been able to establish a small-scale enterprise model in the target area. The essence of this model is expressed below in terms of 1) a technology model and 2) a process model.

Technology model

a. Products

The project designated bread as its target product because it fulfilled the following conditions.

- A product of high necessity in the target area, which is currently provided from the outside (existing demand and the possibility of an alternative)
- A product that can be differentiated from already existing products (advantage in market competition, possibility of a niche market)
- A product that can be produced without a high level of capital accumulation (low impact)
- A product that can be produced without a high level of production technology (value adding by using simple technology)
- A product that can be produced without a large-scale organization (management by a small number of people)

In the target area, many goods and services, including food products, depend on input from the outside, residents having no choice but to purchase them for a price to which transport charges and profit margins of intermediary traders have been added. Therefore, offering differentiated goods and services that are produced locally, at competitive prices, can attract customers. Furthermore, since it is unrealistic to adapt a business model premised on high-level capital investment and recurrent expenditures when targeting poor and low-income groups, it is crucial to make use of existing local resources and to keep purchases from the outside to a minimum in order to reduce initial costs and risks. In addition, by maintaining a small-scale

operational structure it is possible to facilitate sustainable business operation.

b. Marketing strategies

Based on our experience in sales of oven-baked bread, marketing strategies for small-scale business entities in the target area can be summarized as follows.

- In the first stage, individual customers are gradually won through individual sales within communities.
- Recognition and popularity of the product and the group are secured by stably supplying a good-quality product.
- Growing recognition and popularity of the product and the group lead to increasing numbers of regular customers.
- Requests and needs of regular customers serve as a basis for the improvement of existing products and for new product development.
- Sales at pension-pay-points and other local markets are used as opportunities to secure more clients.
- While continuing individual sales within the community, the possibilities of extending sales to schools and other institutions are explored.

c. Business skills that need to be strengthened

When providing support to individuals and groups engaged in small-scale enterprises in the target area, basic training including production technology of the manufactured product, marketing, accounting knowledge (basic bookkeeping) and organizational and managerial skills is crucial, irrespective of the type of business involved. The importance of accounting knowledge and organizational and managerial skills cannot be overemphasized. Organizational and managerial skills include the sharing of information concerning account situation, as well as leadership, clarifying the division of managerial tasks and of members' roles, and the transparency of decision-making processes.

d. Profitability

Based on the figures obtained through implementation of this pilot project, the team calculated the profitability of a standard business model.

A loaf of bread costs SAR 3.5. The cost of ingredients per loaf is about SAR 1.5. If one can bake 30 loaves of bread and sell all of them in a day, a day's sale is SAR 105 and the gross profit is SAR 45. If this operation is done 25 days a month, then the monthly gross profit is

SAR 1,125.

Thus a group's gross profit per month is about SAR 1,125. If a group is made up of 5 members, a member's monthly income is SAR 225. Since the child support of SAR 190 a month (as of October 2006, up to age 14) makes up a large portion of a household's income in the target area, this amount is considerable. Thus it is fair to say that incomes through bakery activities have had a positive impact on inhabitants.

Process model

"Process model" here shows how supporting organizations should proceed when disseminating the technology model described above.

a. Designation of model groups
b. Strengthening of model groups
c. Formation of new groups
d. Technical training for new groups
e. Initiating activities for new groups
f. Reconstruction of new groups
g. Strengthening the activities of new groups

When designating model groups (a), it is important to select groups with previous experience in handling some sort of goods or services, and who have the motivation and the interest necessary to act as partners in the subsequent extension stage. Otherwise, there is a high risk that assistance will stop at the level of the model groups, without reaching the extension stage. Strengthening the model groups (b) should not be limited to simply developing infrastructure, but it should improve the group's comprehensive business capacity through training targeting the business skills.

In the new group formation stage (c), the morale of new group members is usually high, and limited intervention from outside assistance organizations can be sufficient. During the technical training (d) as a next stage, the preparatory activities of the model group must be energetically supported. Since it would be the first time model groups "teach" their experience to third parties, it would be difficult for them to conduct effective workshops without support from assistance organizations. However, the beneficiaries of teaching are not just those who are taught. Those who teach gain many psychological benefits such as a sense of satisfaction and achievement, and capability to verbalize their experience in order to convey the experience

to their students. Such psychological benefits are critical to small-scale business development.

After the workshop, it is the time for new groups to start their own activities (e). However, after a while, opinion conflicts with regard to activity content and role division may cause some of the members to withdraw, making group restructuring (f) a necessity. In such a situation the outside assistance organization does not need to try to dissuade leaving members from withdrawing. The adversities a group has to face should be considered an indispensable process by which a stronger sense of fellowship is built for the future.

The performance of an outside assistance organization comes under scrutiny once the stage of strengthening activities for new groups begins (g). Groups that have adjusted their internal organization through the restructuring process are then faced with issues related to production technology, marketing, accounting and organizational management. In such situations, only outside assistance organization can provide useful advice. It should be remembered that the role of them is to offer “advice,” not to give “instructions.” It is essential to entrust the final judgment to the group carrying out the activities, in order not to affect their ownership.

(3) Extension of the business model by local actors (self-sustaining extension)

The final achievement of the project consists of the voluntary extension carried out by local actors without the mediation of the team. The initial plan of the current project covered developments up to the stage where model groups became able to conduct technical training for new groups, and new groups got their business on track. However, things are progressing to the point where a new group independently provides a technical training for another group.

For example, one of the new groups, Gaatan, ran into a group with a strong interest in the baking business at an association event where they were selling their oven-baked bread. At the group’s request, Gaatan implemented the training program on their own. It is noteworthy that in this case a new group managed to provide the necessary transportation means and to cover transportation costs independently, carrying out training without absolutely any intervention from the team. While the need to monitor the course of future activities still remains, the fact that local inhabitants engaged in extension activities by themselves represents an important step towards continuity and sustainability.

7.5.5 Evaluation results and challenge for future activities

(1) Evaluation results

As stated in “7.5.4 Achievements”, the project accomplished many results. The table below is a comparison between the initial project objective and the actual achievements. Although some objectives were not met as they were a bit too demanding, it is fair to say that the project achieved most of what the project team had planned.

Table 7.5-2 Planned objectives and achievement of the Women Business Promotion Project

Level of objective	Indicator	Achievement
Project objective	Women’s business promotion project increases income sources.	Groups that are doing well have increased income sources.
Outputs in the intermediate stage in the project implementation period	Improvement in baking	Objective to left meant that two model groups see their baking improved compared to pre-project period. But there has been little change as switching fuel to coal did not work.
	Using savings for other activities	Many groups began with no capital and none has managed to accumulate savings.
	Model groups develop other bakery products.	In addition to loaves, rolls and donuts are produced.
	Model groups develop other food products.	No products other than bread were developed.
	Model groups keep accounting records.	Model groups keep accounting records.
	Model groups start marketing.	Model groups carried out many undertakings such as door-to-door sales in villages, sales at pension provision point, and winning contract from neighboring elementary school.
	Potential groups are found in target area. Experiences of model groups are disseminated.	Based on activities of 2 groups in beginning, 7 new groups started bakery business inspired by this pilot project. First 2 groups are providing direct technical guidance to all 7 groups. Of these 9 groups, 5 are doing well.

This project was evaluated in a participatory way through a workshop by the target group members. The following are some of the views of the participants.

Views related to the project objective

- ”Now we are earning more than ever.”
- ”I can work instead of staying home idly.”
- ”Now we can hire others in the community.”

Views related to the project objective in the intermediate stage

・”Now we can bake bread that tastes better one baked by stores, and ours is more popular.”

Other views

・”It is very hard to obtain firewood, and it is becoming even harder.”

・”In the rainy season, sometimes heavy rains destroy mud furnaces.”

・”It is hard to manage group members. An important issue is how to deal with members who are absent from work without permission.”

・”We need more people to help us. We cannot keep up with demand.”

The views above indicate some important issues. The most important issue is fuel. Options would be to plant trees nearby to use them as firewood in the future, or switch to some other fuel such as coal. But the latter is not feasible given the cost and difficulty in procurement. The team has discussed the need for tree planting with various groups, but it has not been implemented yet. With regard to personnel management, the team discussed with the groups such measures as devising group rules on disciplinary action for absenteeism, and planning an increase of personnel while taking into consideration the need to make profits. But some outside assistance may be needed for groups that have had little experience managing business operations until they are capable of managing businesses on their own.

(2) Challenges for future activities

Lack of a succeeding implementing agency

In the final stage of this study, the team found the possibility of handing over the implementation of project activities to the DHSD. But there is no guarantee that DHSD will take over as the implementing agency.

Procurement of fuel

As a participant stated, in the medium and long term, it is difficult to use firewood as fuel and obtain it by logging natural forests nearby. Thus the project should start planting firewood nurseries for the future. Fortunately, the Community Forestry Project of this Study has produced a nursery field in Radingwana. A feasible option would be to obtain nurseries of such plants as moringa that grow relatively fast and can be used as firewood.

Table 7.5-3 Outcomes of Promotion of Women's Businesses

	General	Production	Selling	Group management	Achievement
Ga-Seroka	Good. Can provide technical training to others. But not very motivated to expand business.	Can now use new furnace well. Also uses traditional mud furnace. Produces 30 loaves a day.	Sells bread in community, including areas near school.	No problem. Members get along very well	Good but income per person is about 80 R as there are 12 members.
Ga-Nchabeleng	Good. Can provide technical training to others. But not very motivated to expand business.	Can now use new furnace well. Also uses traditional mud furnace. Produces 30 loaves a day.	Sells bread in community. Selling at retailer nearby was also temporarily successful, but is now in trouble as transportation fee is too high.	No problem. Leader dropped out, but members get along very well.	Good but income per person is about 80 R as there are 12 members.
Mashilabela	Stagnant. Many problems among members and activities are sluggish.	No problem with regard to production technology. Has also technology to bake whole grain bread. Produces 30 loaves a day.	Has bad reputation in community due to problems in group and that negatively affects sales.	Many problems. Woman in leadership post is problematic. Constant quarrels with other members.	Poor as activities themselves are stagnant.
Strydkraal	Stagnant due to small number of members and problems in group.	No problem with regard to production technology. Produces 30 loaves a day.	Sells bread in community. Distributes it to elderly and others whom group supports.	Seems to have some problems as group is not functioning, but details are not known.	Poor as activities themselves are stagnant.
Mphane	Very good. Although group has 8 members, production and sales are large and management is going well.	Produces twice quantity of other groups. Average production is 60 loaves (30 X cycles) per day. As new products, started baking sweet pastries as well.	Sells bread in community. Demand is large as community is large.	No problem. Leader is capable and popular, and little quarrel among members.	Very good. Expected income per person is more than 300 R a month.
Makgoabe	Very good. Small number of members, good production, sales and management. Ideal small business.	No problem. Plans to increase production from 30 loaves a day to 60 loaves.	Sells bread in community. School is very near project site and demand is large from students and teachers. Selling in school by contract may also be possible.	No problem. Leader dropped out, but remaining members work more closely than ever.	Good. Expected income per person is more than 190 R a month.

(continued on next page)

Table 7.5-4 Outcomes of Promotion of Women's Businesses (continued)

	General	Production	Selling	Group management	Achievement
Mashabela	Good.	No problem. Produces donuts as well as bread. Produces 30 loaves of bread and about 100 donuts a day.	Sells products in community and pension provision point. Elementary school is very near project site and demand is large from students and teachers. Donuts are especially popular among students.	No problem. One member is on leave due to domestic violence.	Good. Estimated income per person is more than 250 R a month.
Tswaing	Good. But management may be problematic after expansion based on grant from Welfare Dept.	No problem. Produces 30 loaves a day.	Sells bread in community. Demand is small as community is small.	No problem. Large group with 17 members, but work together smoothly.	Poor. Income per person is 55 R as group has many members.
Phokowane	Stagnant. Women's league discourages group and slows down activities.	No problem with regard to production technology, but produces only once or twice a week. Produces 30 loaves a day.	Sells bread in community.	No problem within group. But Women's league is interfering and damaging group morale.	Poor as activities themselves are stagnant.
Glein Cowie	After training, one of two members was hospitalized, and activities were cancelled.				

7.6 Community Soil Conservation Project

7.6.1 Purpose of the project

Serious soil erosion and gully (donga) erosion are widespread problems in the target area. Various soil conservation measures and projects are underway both inside and outside the target area. While measures of these projects using fences and structures made of tires have proved successful in restoring vegetation, these projects have room for improvement in their facility management, scale of input and design.

Although the Geen Einde and Koringkoppies and some other projects applied participatory approach in the form of providing labor for the construction work, there is not enough community participation in project planning and setting up maintenance systems. Moreover, communication between the communities and LDA after the construction is neither smooth nor regular. An inadequate structure for community participation seems to be a fundamental reason that many projects are not maintained in a sustainable fashion.

Taking into account these factors, this pilot project was designed with the two objectives described below.

1) Creating a sense of ownership among the community members to realize the continuous, self-initiated, active participation of both community residents and LDA staff. Participation of both parties from the planning stage throughout the process of the project should be maintained.
2) Developing a technical design for simple soil conservation structures that will achieve the maximum result with limited input and can be easily built and maintained by local communities.

Table 7.6-1 shows the logical framework for the Community Soil Conservation Project. Target communities for this project were selected on the basis of the two criteria below.

1) The community's farm land and/or rangeland is damaged by soil erosion to the extent that their production is negatively affected significantly.
2) Community members understand that they must take action to solve the soil erosion problem, and have strong will to participate in soil conservation activities.

The following three communities was chosen as the target communities.

Municipality	Target communities
Fetakgomo	Mankotsana (target site area = 383ha)
	Machacha (target site area = 134ha)
Makhuduthamaga	Tjatane (target site area = 576ha)

Table 7.6-1 Logical Framework for Community Soil Conservation Project

Project Summary	Indicators	External conditions
Overall Objective A) Impact of soil erosion is alleviated. B) Ability of the target communities to address soil erosion problems is improved. C) Ability of project staff to carry out soil conservation projects is enhanced.	A) Condition of soil erosion, floods, vegetation, area of land with farm crops and crop yields. B) Changes in awareness, initiative, technical knowledge and management skills. C) Changes in awareness, initiative, technical knowledge and management skills.	There is no flood damage so severe that it exceeds the capacity of soil conservation structures to withstand it.
Project Objective The soil conservation structures built in the project are maintained regularly and sustain their necessary functions.	Maintenance status, sustainability of functions of soil conservation structures, sustainability of maintenance system.	There is no flood damage so severe that it exceeds the capacity of soil conservation structures to withstand it.
Output a) Soil conservation structures are completed. b) An implementation and monitoring system is built up on both LDA and community sides. c) Maintenance system is devised on both LDA and community sides. d) A model is established, including a standard design, a standard implementation process and a standard implementation system.	a) Functionality of soil conservation structures. b) Functionality of implementation and monitoring systems. c) Functionality of maintenance systems. d) Model's technical completion and effectiveness.	There is no severe flood damage before the output created in this project brings about a good effect. There is no vandalism by neighboring communities.
Activities a-1) Planning, surveying and designing a-2) Civil engineering and construction work a-3) Fence construction a-4) Forestation and planting a-5) Create nursery garden (option) a-6) Monitoring and evaluation a-7) Maintenance b,c-1) Organize community residents and organize administration's project staff b,c-2) Participation of community and project staff in activities a-1) – a-7) b,c-3) Prepare and distribute guidelines and manuals d-1) Create model based on existing criteria, lessons from cases in the past, and project experience and achievements d-2) Verify effectiveness of model in project implementation d-3) Prepare and distribute guidelines and manuals	**Input** Materials: Used tires, vetiver, nursery trees, and others Equipment: Bulldozers, graders and others Staff: Local consultants Surveyors Builders Community residents Project staff Funding: JICA R 454,000 LDA R 15,476,000 District R 230,000 Total R 16,160,000 (Please refer to "3.6.2 Input" for details.)	There is no severe flood damage before the soil conservation structures are completed. There is no vandalism by neighboring communities. **Prerequisite** The administrative side provides financial support.

7.6.2 Input

Table 7.6-2 provides an overview of the financial input alone during the project implementation period (fiscal 2004 – fiscal 2006). LDA provided funding for the surveying and design, and LDA and JICA financed the construction work. The majority of the work was outsourced. The LDA Sekhukhune district office used the budget for the Comprehensive Agricultural Support Programme (CASP) for the subsequent fencing work. Community residents provided the labor for the construction work, fence construction and eventual forestation and planting work.

Table 7.6-2 Financial input to the Community Soil Conservation Project

(Unit: SAR)

Fiscal year	Project site			Total
	Mankotsana village	Machacha village	Tjatane village	
Fiscal 2004	Surveying, design, management → LDA funding: 118,000 Waterway construction → LDA funding: 136,000 → JICA funding: 149,000 Total 403,000	Surveying, design, management → LDA funding: 87,000 Waterway construction → LDA funding: 584,000 → JICA funding: 151,000 Total 822,000	Surveying, design, management → LDA funding: 95,000 Stone collection → LDA funding: 100,000 Total 195,000	LDA funding: 1,120,000 JICA funding: 300,000 District funding: 0 Total 1,420,000
Fiscal 2005	Construction work for protection of waterways → JICA funding: 154,000 Fence construction → District funding: 35,000 Total 189,000		Digging well for nursery garden → LDA funding: 87,000 Total 87,000	LDA funding: 87,000 JICA funding: 154,000 District funding: 35,000 Total 276,000
Fiscal 2006	Waterway repairs, construction work to safeguard aqueduct → LDA funding: 2,100,000 Total 2,100,000	Waterway protection, embankment work → LDA funding: 2,421,000 Total 2,421,000	Waterway, waterway protection, contour work → LDA funding: 5,202,000 Installation of hand pump for nursery garden → LDA funding: 13,000 Total 5,215,000	LDA funding: 9,736,000 JICA funding: 0 District funding: 0 Total 9,736,000
Sub-total (completed portion)	LDA funding: 2,354,000 JICA funding: 303,000 District funding: 35,000 Total 2,692,000	LDA funding: 3,092,000 JICA funding: 151,000 District funding: 0 Total 3,243,000	LDA funding: 5,497,000 JICA funding: 0 District funding: 0 Total 5,497,000	LDA funding: 10,943,000 JICA funding: 454,000 District funding: 35,000 Total 11,432,000

Fiscal year	Project site			Total
	Mankotsana village	Machacha village	Tjatane village	
Fiscal 2007 (estimation)	Embankment and contour work → LDA funding: 2,640,000 Fence construction → District funding: 115,000 Total 2,755,000	Contour work → LDA funding: 1,893,000 Fence construction → District funding: 80,000 Total R 1,973,000	LDA funding: 0 District funding: 0 Total 0	LDA funding: 4,533,000 District funding: 195,000 Total 4,728,000
Total	LDA funding: 4,994,000 JICA funding: 303,000 District funding: 150,000 Total 5,447,000	LDA funding: 4,985,000 JICA funding: 151,000 District funding: 80,000 Total 5,216,000	LDA funding: 5,497,000 Total 5,497,000	LDA funding: 15,476,000 JICA funding: 454,000 District funding: 230,000 Total 16,160,000

The personnel input included local consultants, surveyors, builders, community residents and project staff. The project staff was comprised of managers from the LDA Head Office, district office staff members, extension officers and survey team members.

The following construction equipment was provided:

① For earthwork such as the waterways, stormbanks and contours: graders, dozers and tractors

② For construction of access roads: water tank trunks, small-scale pumps, rollers, power generators

③ For small-scale excavation for waterway protection structures: jackhammers, power generators

④ For transport of equipment and materials: trucks, trailers

LDA has construction machines such as graders, dozers and tractors, so the project used the LDA's machines to keep construction costs down in fiscal 2004. However, many pieces of them broke down and could no longer be used from fiscal 2005. Instead, necessary machines had to be obtained from the private sector. The project was able to rent a tractor from a neighboring farmer at a reasonable rate, but graders and dozers had to be leased from private suppliers, which pushed up construction costs.

The following materials were provided.

① For aqueduct protection structures: Used tires, geotextile (a fibrous material that prevents seepage), fittings such as bolts and nuts, seeds of grasses such as bermuda and tef, fertilizer, and others

② For forestation and planting: tree seedlings, seedlings of vetiver grass, seeds of bermuda and tef, fertilizer and others

7.6.3 Process of the implementation

(1) Preparation stage (FY 2003)

During the period from September through December 2003, a preliminary draft plan for the pilot project was prepared in tandem with the selection of the target communities and, as described above, three communities were selected.

(2) First year (FY 2004)

The project team was organized in May. First, a workshop on the participatory approach was held, and specific method of participatory planning was discussed. Afterwards, the activities described below were carried out in the target communities using the PRA method.

① A task team of about 10 to 15 people were selected from residents of the target communities. This task team took the lead in preparing a base map of the community land, narrowing down the target site for soil conservation activities, conducting a transect walk, and resource mapping within the area.

② The task team members presented the results of the transect walk and the resource mapping to the community residents, and discussed the current condition of the area, the problems and solutions with the community.

③ Based on the results of these discussions, the target communities created a soil conservation map on top of the resource map, with a plan of soil conservation structures (streambank, waterways, contours, fences, vegetation and others) inscribed.

From July to August, the Soil Conservation Committee ("Committee") was established in each of the target communities.

Photo 7.6-1: Deciding where to place a fence in Machacha

From August to December, the local consultants carried out detailed surveys of the target sites and made detailed designs on soil conservation structures such as streambanks and waterways. In addition, the committee members and the project team carried out a survey on various locations and then decided where to set up a fence. (Photo 7.6-1)

Figure 7.6-1 provides samples of a soil conservation map drown by the community and a detailed design made by a local consultant.

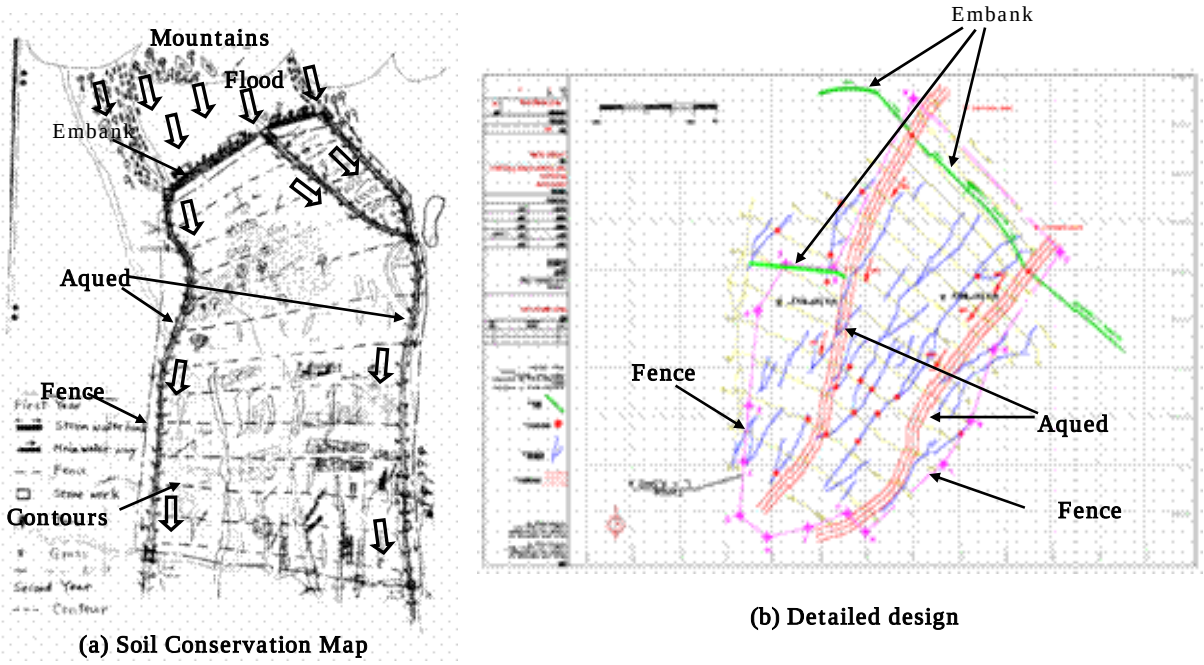

Figure 7.6-1 Sample of Soil Conservation Map and Detailed Design (Machacha)

In November, the project team carried out a baseline survey to grasp the state of soil erosion, vegetation, and agricultural production, as well as awareness of stakeholders including community members on soil conservation activities. The results of this survey became the baseline data for the subsequent monitoring and evaluation.

In December in Mankotsana and Machacha, the project team made vetiver grass nursery fields to increase the vetiver grass that would be needed in mass quantity for soil conservation activities in the future. The team cultivated the vetiver grass on existing dongas near the project site in Mankotsana, and a location upstream the existing dam in Machacha, respectively. (Photo 7.6-2)

Photo 3-6-2: Planting vetiver grass in Mankotsana

Then the project team selected and forged a contract with a construction firm, and the firm began constructing waterways in Mankotsana and Machacha. (Photo 7.6-3)

In February 2005, the committee in Tjatane expressed interest in constructing a tree nursery. Thus the project team planned and implemented a study tour to Radingwana, where the Community Forestry Project was carried out. About 10 representatives took part in the study tour.

(3) Second year (FY 2005)

From May to November 2005, the project team put together documents for bidding of firms that would construct soil conservation structures, selected a construction firm for the work, and concluded a contract with the firm. In November, the contract was concluded with the firm based on the JICA funding.

Photo 7.6-3: State of constructed aqueducts in Machacha
The upper photo was taken in June 2005, right after construction; the lower photo, in June 2006, a year after construction. Some vegetation is

In June, for the committee in Tjatane that expressed interest in constructing a nursery, the project team carried out training in Rusplass nursery fields owned by DWAF.

From July to September, using the CASP fund, the project team built a fence in Mankotsana project site. The Committee mobilized community members for the construction. As a result, of the total planned fence length of 8.5 km, about 2 km was completed.

From February to March 2006, the construction was carried out. The construction firm employed community members as labor force and supervised their work. (Photo 7.6-4)

Photo 7.6-4:

Constructing aqueduct protection structure with tires in Mankotsana

In the construction, the following problems occurred.

Delay in administrative procedures

Initial part of the construction work (procurement of used tires and machinery, and sowing on top of aqueducts) was supposed to be funded by LDA, and followed JICA funded works (construction of protection structure for waterways and streambanks). However, LDA was late in processing the orders for the LDA funded portion. Due to this unreliable situation, in January 2006, the project team decided to amend the contract with a firm for the JICA funded work, so that the construction can start without waiting for the LDA's process. Due to this amendment, JICA funded work should have been limited to the construction of protection structure for waterways in Mankotsana. The remaining work had to be completed within the fiscal year of 2005.

Damage by flood on 3 March 2006

After the contract was amended, the construction of the waterway protection structure proceeded. On 3 March 2006, a major flood occurred in Mankotsana. Most of the constructed protection structure as well as generators were swept away, and waterways as well as access roads were severely damaged. Fences were also collapsed. (Photo 7.6-5) Thus it became impossible to continue the construction work. Eventually, upon discussions with JICA and LDA, the project team decided to suspend the construction, and resume the construction in the fiscal year 2006, including repair of the damaged structure.

Photo 7.6-5 Damage caused by a flood occurred on 3rd March 2006 in Mankotsana

The flood is estimated to have been even more serious than the scale of flood that would occur once every ten years that was taken into consideration in the original plans for the protection structure. Given the traces of the flood, it is estimated that the flood flow had the depth of about 1 m, the width of 80 m, and the scale of the flood was more than three times the capacity of the waterways.

(4) Third year (FY 2006)

From May to August 2006, for the construction of soil conservation structures in Mankotsana, Machacha, and Tjatane with LDA funding (including construction, and forestation and planting on top of aqueducts as well as contours), the project team prepared tender documents, carried out the bidding, selected a construction firm for the work, and concluded a contract with the firm.

In August, the project team carried out a study tour to the flood-damaged sites in Mankotsana. This study tour was meant to encourage interaction among the three target communities, boost their motivation, and serve as part of participatory evaluation of the project by the participants. About 10 people from each of the three target communities, or about 30 in total, took part in the study tour. (Photo 7.6-6)

Photo 7.6-6 Study tour to Mankotsana, August 2006

From September 2006 to February 2007, the construction work was carried out. Community members worked on forestation and planting and the construction firm supervised their work.

In January 2007, again as part of participatory project evaluation, the project team carried out a study tour to the three sites where the construction work was under way. About 10 people from each of the three target communities, or about 30 in total, took part in the study tour. In addition, after the study tour, each target community had a follow-up meeting. Meanwhile, the project team carried out a questionnaire survey on the participants in order to

evaluate changes in the views of the committee members and community members.

In January 2007, guidelines for implementation of the soil conservation project and a soil conservation structure maintenance manual were compiled and distributed to the relevant stakeholders.

7.6.4 Achievements

Table 7.6-3 shows the outputs achieved through the activities from the fiscal years 2004 to 2006. As stated above, because the project activities were disrupted from time to time due to flood damage and delay in LDA's administrative procedures, not all planned activities were completed. The planned structures were almost completed in Tjatane. But in Mankotsana and Machacha, about 40 to 50% of the planned structures are incomplete. Meanwhile, in terms of organization, the implementation structure by both inhabitants and LDA is almost complete. However, at this point, this implementation structure had not done any maintenance activities and has yet to be firmly established.

Table 7.6-3 Outputs of the Project

Target community / Outputs in "Table 7.6-1 Logical Framework"	Mankotsana	Machacha	Tjatane
Completion of soil conservation structures	Completion of soil conservation map; completion of detailed design Waterway completed L = 3.3 km Access road completed L = 3.3 km Waterway protection completed N = 49 sections Planting on top of aqueducts completed Parts of fence completed L = 2.0 km Unfinished construction(51%): Embankment L = 1.7km Contours L = 56 km Planting on top of embankments Planting on top of contours Fence L = 6.5 km	Completion of soil conservation map; completion of detailed design Waterway completed L = 3.0 km Access road completed L = 8.0 km Waterway protection completed N = 90 sections Planting on top of aqueducts completed Embankments completed L = 2.2 km Unfinished construction (38%): Contours L = 90 km Planting on top of embankments Planting on top of contours Fence L = 4.5 km	Completion of soil conservation map; completion of detailed design Waterway completed L = 7.6 km Access road completed L = 7.6 km Waterway protection completed N = 123 sections Contours completed L = 97 km Planting on top of aqueducts completed Planting on top of contours completed No unfinished construction work

Target community / Outputs in "Table 7.6-1 Logical Framework"	Mankotsana	Machacha	Tjatane
Establishment of implementation and monitoring system in both LDA and community sides Establishment of maintenance system in both LDA and community sides	Committee has been formed. ● Project staff was designated. ● Application of PRA method in planning, designing, construction, forestation, planting, and monitoring. ● Study tours and discussions were held as part of participatory evaluation. ● Project implementation guidelines for LDA staff and maintenance manual for communities have been prepared and distributed. ● Unfinished work: establishment of maintenance system and implementation of maintenance activities.	Committee has been formed.	Committee has bee formed.
Establishment of models including standard design, implementation process, and implementation system	● Description on soil conservation activity model is ready. ● Project promotion guidelines for LDA staff and maintenance manual for communities, both of which are based on soil conservation activity model are prepared and distributed. ● Unfinished work: examination of models including maintenance activities and maintenance system.		

7.6.5 Evaluation Results and challenges for future activities

Detail results of the evaluation of the Community Soil Conservation Project are attached to the end of this chapter. Table 7.6-4 shows an evaluation grid used for this evaluation. There are a few items that cannot be evaluated at this point of report writing, as no agricultural activities or maintenance activities after completion of soil conservation structures was observed. It is necessary to continuously monitor and evaluate to take necessary data in line with the evaluation grid.

It is fair to mention that the effectiveness of the waterway protection structure combining tires and vegetation has been proven to a certain extent as the structure withstood a flood. But it is necessary to examine the effectiveness of the soil conservation system as a whole combining streambanks, waterways, contours, fences, forestation and planting. The effectiveness of the system against sediment discharge and soil erosion needs to be examined after the completion of the system.

Capacity building of LDA staff and the communities helped them become more capable of making plans ahead and managing soil conservation activities. Nevertheless, there still room for improvement to be self-reliant for preparing appropriate plans and for implementing all the necessary activities of participatory soil conservation. More capacity building is needed, and that will need more assistance from the outside.

This pilot project could not manage to complete the soil protection structures and begin maintenance activities. In many existing soil conservation projects near the target area, maintenance is inadequate, or planned activities are not sustained even if the plans are appropriate. Thus it is very important to establish a sustainable management and maintenance system in the soil conservation project. This is an issue to be tackled in the future

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Table 7.6-4 Project Evaluation Grid

Evaluation criteria	Sub-criteria	Indicator	Necessary Data	Data Collection	Summary of Evaluation Results
Category A: Measuring outputs (“Effectiveness” in the five evaluation criteria)					
(A-1) Validity of the model	Design	Comparison with target values Comparison with past examples	Evaluation results in Categories B and C	Reviewing evaluation results	The effectiveness of the waterway protection structure using tires has been proven to a certain extent as the structure withstood a flood. But it is necessary to examine the effectiveness of the structural design as a whole after the structure is complete and farming and maintenance activities start. Due to proper selection of target areas and materials for waterway protection structures, this project is more efficient than past projects. Thus it is fair to mention that the design model has been valid.
	Process Organization/system	Comparison with target values Comparison between pre-implementation and post-implementation Comparison with past examples	Evaluation results in Categories B and C	Reviewing evaluation results	The effectiveness of the waterway protection structure using tires has been proven to a certain extent as the structure withstood a flood. Planned process and organization/system have contributed to the making of proper plans and design. Communities and LDA are not yet capable of sufficient activities on their own, and there have been no maintenance activities. Thus their activities from now on determine whether planned process and organization/system help them build their capacities and establish proper maintenance and management system.

Evaluation criteria	Sub-criteria	Indicator	Necessary Data	Data Collection	Summary of Evaluation Results
Category B: Measuring effectiveness（"Effectiveness" and "Impact" in the five evaluation criteria）					
(B-1) Functions of constructed structures	Turning flood into safe flow Prevention of further erosion	Comparison with target values	Extent of impact of erosion	Observation	The effectiveness of the aqueduct protection structure combining tires and vegetation has been proven to a certain extent as the structure withstood a flood. But it is necessary to examine the effectiveness of the soil conservation system as a whole. The effectiveness of the system against sediment discharge and soil erosion needs to be examined after the completion of the system with vegetation fully grown all over aqueducts and all the elements in place including embankments, aqueducts, contours, fences, forestation and planting.
(B-1) Functions of constructed structures	Promotion of vegetation recovery Prevention of loss of soil moisture	Comparison with target values	Extent of vegetation recovery	Observation	It cannot be evaluated at this point as it is a long-term effect.
(B-2) Improvement of agricultural production		Comparison between pre-implementation and post-implementation	Changes in amount of cultivated areas and harvest	Questionnaire	It cannot be evaluated at this point as there is no record on farming since the completion of the structures.
(B-3) Communities' capacity building		Comparison between pre-implementation and post-implementation	Changes in awareness, motivation, knowledge and capacity	Questionnaire Observation	Community inhabitants have become more active to the soil conservation activities and implement activities under supervision of outside parties. But they are not yet capable of planning and implementing activities as a whole on their own.
(B-4) Project staff's capacity building		Comparison between pre-implementation and post-implementation	Changes in awareness, motivation, knowledge and capacity	Questionnaire Observation	Project staff members have become more aware of the need to plan ahead and soil conservation activities. But they are not yet capable of planning and implementing activities on their own.
(B-5) Economic effects/outcomes		Comparison with target values	Input, benefit, negative impact	Reviewing references on outcomes	This matter cannot be evaluated at this point as there have been no farming or maintenance activities since the completion of the structures.

Evaluation criteria	Sub-criteria	Indicator	Necessary Data	Data Collection	Summary of Evaluation Results
Category C: Comparison with past examples（"Efficiency", "Effectiveness", "Impact" and "Sustainability" in the five evaluation criteria）					
(C-1) Comparison with past examples in terms of economical efficiency, sustainability and effects/outcomes	Efficiency	Comparison with past examples	Input, benefit, negative impact	● Observation ● Reviewing LDA references	Compared to past projects with ample funding, this project is more efficient. Factors that contribute to higher efficiency include proper selection of target areas and materials for protection structures.
	Sustainability	Comparison with past examples	Maintenance situation Whether structure functions are sustained Whether maintenance system is sustained	● Observation ● Reviewing LDA references	There are many past projects whose maintenance system was not sustained. Since this project has not has any maintenance activities, it is not possible to evaluate at this point the extent to which participatory activities have contributed to the making of a maintenance system.
	Effects / outcomes	Comparison with past examples	Emergence of effects/outcomes	● Observation ● Reviewing LDA references	This matter cannot be evaluated at this point as there have been no farming or maintenance activities since the completion of the structures. But this project is likely to bring about some good results as it has been improved in design and structure of a maintenance system.

7.7 Mobile Information Unit Project

7.7.1 Purpose of the project

Inhabitants of the target area face such problems as harsh climate, limited water resources, limited educational opportunities, and economic gaps between the rich and the poor. To address these problems as much as possible, assistance from the outside as well as the people's intension toward development is essential. Any information service from government agencies must take into account how to motivate the people to take a proactive attitude toward development.

Previously, information from LDA reached only farmers who were involved in government-led projects. Consequently, farmers whose projects ended or people who were not involved in projects had very limited access to LDA-provided agricultural information. In other words, LDA's information service was done based on the logic of the supply side, and it needed to be reconstructed so that information would be provided based on the needs of the demand side. A good way to restructure an information provision system is to place an information outlet in a location accessible by anyone so that whoever wants the information is free to take it. The mobility of people in the target area is limited due to lack of public transportation and a low level of income. Thus it is better to bring an information source close to those who want the information, rather than having people reach the information source on their own.

Given such background, this project decided to put together a Mobile Information Unit, a caravan equipped with media and information devices and educational materials on agricultural techniques, and try using the Unit for extension activities in the target area on a regular basis. This scheme would expand opportunities for people of the target area to access agricultural information. In addition, the project aimed to strengthen working relationships between LDA's communication section in the Head Office and other stakeholder organizations, e.g., Sekhukhune district offices, research institutions, and training centers, and secure necessary information sources.

In the target area, there are a limited number of small but independent, creative and hardworking farmers. It is quite possible to enhance agricultural development by having these farmers serve as local role models for farm management. To disseminate information that already exists in the target area in such a way is an effective information strategy. This project worked on establishing an information service to collect such valuable local information and then effectively disseminate it back in the target area.

7.7.2 Input

The following are the inputs for this project.

（1） Equipment and facilities: Mobile Information Unit itself (trailer) and media devices (large screen, video player, projector, etc.)

（2） Materials: Resources for making extension educational materials, video camera for making video programs

（3） Other expenses: Fuel expense for the towing vehicle

（4） Human resources: Project Leader (communication section); Sekhukhune District office (responsible person for communication); Person in charge of the consultation counter (agriculture extension worker);

7.7.3 Process of the implementation

(1) Outline of the project

Mobile Information Unit

The Mobile Information Unit is a caravan equipped with extension educational materials such as brochures and booklets as well as media devices such as a video player and a projector. The project carried this Unit with a towing vehicle and visited the target area on a regular basis.

The Mobile Information Unit is to be used mainly for the following two activities.

- Providing general agricultural information through distribution of brochures and booklets, and providing monthly features through video screenings and seminars.
- At least one extension officer is to be always assigned to the consultation counter and address agriculture-related questions and consultations from people. If a question or concern of inhabitants cannot be addressed at the counter, the extension officer is to take the question back to their office, collect information from appropriate sources such as a District office scientist, a research institute and a university, then come up with an answer in the next visit to the same site. Such scheme will help construct an information service system that meets the needs of the demand side.

Pension-pay-points

The project decided that the Mobile Information Unit was to first visit the pension-pay-points in the target area. As stated previously, to attract business from those who receive pensions,

vendors gather where the government vehicle stops. Such vendors stay in one location for about half a day each as they go after the government vehicle. But where the vehicle stops is the only location in the target area where people gather on a regular basis.

Schedule for visiting the target area, and formulation of educational materials

The Mobile Information Unit was also to visit each pension provision point once a month. Table 7.7-1 shows the details on extension educational materials that the Unit provides.

Table 7.7-1 Information provided by the Mobile Information Unit

Type of information	Example	Means of providing information
General information	Information on such matters as vegetable cultivation, farm financing, poultry farming, farm cooperative, and soil conservation.	Brochures, booklets, and other printed matters
Features	Introduction of this project's pilot projects; introduction of LDA's strategic programs and projects; introduction of independent, creative and hardworking farmers in the area; campaign on cattle disease prevention; and other special information from LDA.	Video programs, field seminars, and other means to attract attention and publicity

(2) Activities in the first year

Baseline survey

Prior to the start of this project, the project carried out a baseline survey. The survey was meant to find out the people's awareness and views on agriculture and LDA. The result of the survey showed that, while they were more interested in agriculture than originally expected, they did not know much about LDA's activities. Many of them did not know that such activities even existed at all. In short, the survey showed a lack of information on agriculture and LDA.

Completion of the Mobile Information Unit

The Mobile Information Unit equipped with media devices was completed in June 2004. Prior to this, the project was officially launched in May 2004 at the kick-off meeting at LDA.

Technical training for putting together extension educational materials

For staff members of LDA communication section, the team carried out technical training for creating extension educational materials. Contents of this technical training included video filming and editing, basic computer operations, video editing software operation, and basics of

DTP. In addition, the team carried out repair and adjustment of the media devices used by the communication section.

Project implementation structure

Initially, the communication section of the LDA Head Office, the primary responsible organization for this project, was to be solely in charge of maintenance, operation and coordination of the Mobile Information Unit Project, then transfer in a year this function to the Sekhukhune district office. However, given the good results of the trial run of the Mobile Information Unit in May and June 2004, the Sekhukhune District office took over all extension activities on its own.

Project activities

In May 2004, the Mobile Information Unit started a trial run. People took a strong interest in the Unit. Fifty to 100 people gathered around the consultation counter and asked questions to and engaged in consultations with Sekhukhune district office staff members and extension workers. During this short trial period, nearly 1,200 copies of booklets on agriculture were distributed, proving that the people of the target area had great needs for agricultural information.

Around July 2004, the Mobile Information Unit began operating in earnest. At the beginning of the Mobile Information Unit's activities, there were problems such as breakdowns in the trailer itself and the towing vehicle and trouble with the battery system. But these problems were addressed by August 2004. From then on, there were no big problems, and the project was able to operate the Mobile Information Unit smoothly in line with the visiting schedule. The consultation counter attracted at most 300 people requesting information. The booklets distributed at that time included those on tomato cultivation, small-scale irrigation, poultry farming, and cooperatives. Meanwhile, people requested information on fruit cultivation, project financing, sorghum production, and institutions providing agriculture training.

The Mobile Information Unit expanded its activities beyond the pension-pay-points; it also started operating in other strategic locations for agricultural extension. Representative examples of such strategic locations are schools and the Multi-Purpose Community Centers (MPCCS). The Mobile Information Unit actively visited both public and private schools so that students

would have a chance to gain information about agriculture and other matters of interest. The Unit visited schools in Jane Furse and Nchabeleng, and special schools such as Sekhukhune Care for Handicapped and Mohlaletsi Disabled School, carrying out extension activities for many students and teachers. The Unit also took part in events held at various MPCCS. Moreover, the Unit took part in an event called the “Road Show” in which all the government institutions in Sekhukhune district, including LDA, gather and introduce their activities to the public. In the Road Show, many people and government officials listened to agriculture information provided by the Mobile Information Unit. Through such PR activities, the LDA Sekhukhune district office learned the basics of information service in line with the needs of the demand side, and is expected to contribute significantly to extension activities in the target area in the future.

(3) Activities in the second year

In the second year, all the operation functions of the Mobile Information Unit were transferred to the Sekhukhune district office, and the team was to provide the minimum level of support to the office if needed. Also in the second year, in addition to its own extension activities, the project made progress to a certain extent as it explored ways to work with other pilot projects. For instance, in a partnership with the Women Business Promotion Project, the Mobile Information Unit advertised recruitment of a new group for the project. The Unit also helped recruit trainees for the Practical Farmer Training Project, contributing to collecting applications from many young people interested in the training. Such instances of cooperation among projects indicate possibilities of not just partnerships with pilot projects but also cooperation with other LDA programmes.

Meanwhile, a new problem has emerged: extension officers no longer serve as advisors at the consultation counter. Such problem is not limited to this project, but the participation of extension officers decreased gradually for the following reasons: extension officers could not be contacted; they did not adjust their schedule to serve as advisors while undertaking other project activities; and they were not very committed to working at the consultation counter to begin with. Then, the communication officer of the Sekhukhune district office essentially took over all the tasks from setting up schedules for visits, formulating themes of presentations, and carrying out presentations. As a result, regular visits are still implemented, but individual technical consultation at the counter is no longer carried out.

7.7.4 Achievements

(1) Mobile Information Unit activities as a norm

Information service activities by the Mobile Information Unit in the target area became regular. Specifically, the Unit visits about 35 pension-pay-points for 10 days a month, and serves 4-5 days a month in extension and PR events held by LDA. Before the start of the project, information service in the target area was limited to information provided from LDA to a small number of people in the area. The establishment of the Mobile Information Unit resulted in a broad information service for any given number of people who request information. The new system substantially increased means for people in the area to access information and has great significance for agricultural development in the future.

(2) New model of the information service system

This project proved the feasibility of a prototype of a new information service system. It is possible to apply this system in other districts by using the methodology and processes used in Sekhukhune district such as baseline survey, setting up and operating a Mobile Information Unit, technical training for preparation of extension educational materials, formulation of a structure for project implementation, and fostering ownership of information service by a district office. The Sekhukhune district office can serve as a role model for other districts, sharing its experience and knowledge. In addition, such information system is applicable in other government institutions, and it is possible to provide other government institutions with information on how the system works.

(3) Ownership by the Sekhukhune district office

As staff members at the Sekhukhune district office succeeded in running the Mobile Information Unit, they came to recognize that they themselves, not the LDA Head Office that they depended on, were the one who undertake the critical functions in information service. This was a major and positive change in their attitude. Moreover, it is clear to the team that the work of the Mobile Information Unit gained wide recognition from people in the area and government officials, boosting the morale of the staff members at the Sekhukhune district office.

7.7.5 Evaluation results and challenges for future activities

(1) Evaluation results

The outputs above were achieved. But compared to the project objective in the planning stage, they are not necessary sufficient. Table 7.7-2 shows the comparison between the actual outputs and the initial project objective.

Table 7.7-2 Planned objectives and achievement of the Mobile Information Unit Project

Level of objective	Content	Indicator	Achievement
Project objective	Inhabitants of target area have better access to agricultural information.	Number of participants in seminars during Mobile Information Unit's visits; number of visitors to consultation counter; and percentage of problems solved among those received at consultation counter	There is no system for keeping records, and number of consultations at counter is not recorded. It is also hard to record number of participants in any given seminar. But every seminar has definitely dozens of participants.
Outputs in the intermediate stage in the project implementation period	Mobile Information Unit is complete.		Mobile Information Unit is complete.
	Regular visits with Mobile Information Unit become extension workers' routine work.	Regular meetings between communication section and district office; extension worker is always present at consultation counter of Mobile Information Unit; consultations at Mobile Information Unit consultation counter are recorded.	District office is completely in charge, and regular meetings ceased between Head Office's communication section and district office. Extension officers no longer serve at consultation counter.
	Educational materials for extension are made.	Educational materials for extension planned between communication section and district office are complete; educational materials needed for monthly topics are made as planned; all educational materials are revised every year.	Communication section of Head Office has been asked to translate into Sotho some extension educational materials, but has not completed work. No new educational materials have been made since LDA took charge, and existing materials are being used.
	Mobile Information Unit carries out regular visits.	Visits by Mobile Information Unit are done as planned.	In addition to monthly visits, Mobile Information Unit visits such locations as schools and takes part in other LDA events.

The results of the evaluation indicate the following: while not the entire vision of a new information vision has been achieved, it is fair to say that a system to provide information in a sustainable and broad way is now in place, which is an improvement compared to the times when the only information sources are extension officers and sporadic events.

In addition, the following outputs were unexpected in the planning stage.

Expansion of the areas of regular visits

As stated above, the Mobile Information Unit has far more opportunities to visit schools and multipurpose community centers within the target area. In addition, the offices of other districts in Limpopo province (such as Mopani, Vhembe, and Capricorn) that heard of the Mobile Information Unit have started requesting visits, and the Mobile Information Unit is taking part in more and more events in these districts. Such expansion in the areas of regular visits has a significant impact by making it possible to disseminate to more people information on agricultural techniques and assistance schemes of LDA.

Providing a platform for people to transmit information

As regular visits by the Mobile Information Unit became routine, some willing people were seen taking up the microphone and discussing their own projects and farm techniques, and promoting their agricultural products. In other words, the Mobile Information Unit came to offer to individuals and groups a platform for information transmission. Such role has not gained wide recognition as a function of the Mobile Information Unit yet, but it can be quite useful if a proper structure to make it work is devised.

Providing information on matters other than agriculture

The consultation counter attracts other areas of consultations that are not necessarily related to agriculture. LDA staff members and extension workers at the consultation counter often refer such consultations to government offices that may be able to address them. Moreover, information provided by the Mobile Information Unit is no longer limited to that from LDA, but includes pieces of information from other government agencies on matters such as HIV/AIDS and prevention of rabies. Thus the Mobile Information Unit may be able to serve as an information hub in the area.

Requests from other districts for the Mobile Information Unit

The offices of other districts in Limpopo province are requesting a Mobile Information Unit of their own. This clearly demonstrates this project’s positive impact.

(2) Challenges for future activities

Improving extension educational materials

Currently, most booklets and brochures distributed by the Mobile Information Unit, and most video programs that the Unit plays, are in English. Materials in Sotho, the local language of the target area, are very limited. In addition, most booklets and brochures provide information through texts with few illustrations and figures. Thus inhabitants who do not know English or those who are illiterate are unable to understand the valuable information that the Mobile Information Unit offers. Moreover, the contents of extension educational materials as a whole are not necessarily suitable for the natural and economic conditions of the target area. During the implementation period of this project, the communication section of the LDA Head Office took the lead in trying to address the problems above, but the contents of the extension educational materials still do not necessarily meet the needs of the demand side. It is necessary to improve the educational material formulation skills of the communication section of the Head Office and the Sekhukhune district office, and strengthen cooperation between these offices and other relevant government institutions.

Commitment of extension officers

Initially, when the Mobile Information Unit would visit the target area on a regular basis, at least one agriculture extension officer was to be always assigned to the consultation counter and address agriculture-related questions and consultations from inhabitants. However, as the Mobile Information Unit's activities went on, cooperation from extension officer gradually decreased. Currently, the communication section of the Sekhukhune district office, in addition to its regular work, is doing the work at the consultation counter that extension officers were supposed to carry out. This makes it hard to respond adequately to concerns of people, or meet the original expectations for the consultation counter. This problem occurs partly because the official duties of agricultural extension officers do not include cooperation with the Mobile Information Unit.

Attachment: Detailed Evaluation Results for Community Soil Conservation Project

The detailed evaluation results for each evaluation category shown in the evaluation grid in Table 7.6-4 are described below.

(1) Measurement of the output – validity of the model

The evaluation of the validity of the model, an output of the soil conservation activities, is based on the results of "(2) Measurement of the effectiveness" and "(3) Comparison with past examples." Table 1 shows the evaluation results of the validity of the model. For the outline of the model, refer to "(5) Technical model," in Chapter 11.

Table 1 Evaluation results of the validity of the model

Viewpoint of evaluation	Criteria of judgment	Evaluation result
Design	1) Required functions of constructed structures being observed. (Based on the comparison with target values set for the evaluation of the item B-1.)	1) It is verified, in a certain extent, that the Combination of tires and grasses is effective for protection of waterways from the observation of tire structures after a flood damage. The effectiveness of the whole design shall be verified after the completion of structures and after the start of farming and maintenance activities.
	2) Simple structures with low input and big effects being designed. (Based on the comparison with past examples in terms of the item C-1 "Efficiency")	2) Compared to past examples with much input of cost and time, the efficiency of the project has been improved. This result comes from the selection of appropriate target area and appropriate materials for protection of waterways. It is considered, in this regard, that the design model is effective.
Process Organization/ system	1) Established processes and organization/system being effective for appropriate planning, designing, efficient and effective project implementation. (To be judged from the evaluation results of above "Design")	1) The effectiveness of the formulated plan, design and the constructed structures is verified; therefore, it is considered that the processes and the organization/system which have yielded those outputs are effective.
	2) Established processes and organization/system contributing to capacity building of communities and project staff members. (Based on the comparison between pre-implementation and post-implementation of the item B-3 and B-4 "Capacity building")	2) Both communities and project staff members have a tendency to wait for instructions of outside supporting staffs, and have not become proactive in acting. The effectiveness of the processes and the organization/system may depend on the future activities and further assistance of outside aid agencies. However, in fact, participatory activities using PRA methods and exchanging activities including study tours have helped motivate community people and project staff members. It is considered, in this regard, that participatory processes are effective.

Viewpoint of evaluation	Criteria of judgment	Evaluation result
	3) Established processes and organization/system contributing to establishment of appropriate maintenance system. (Based on the comparison with past examples in terms of the item C-1 "Sustainability")	3) At this moment, the effectiveness of the model of the processes and the organization/system cannot be evaluated in terms of this criterion because there are no actual achievements of maintenance activities after completion of structures. The effectiveness from the viewpoint of this criterion may depend on the future activities and further assistance of outside aid agencies.

(2) Measurement of the effectiveness

a. Functions of constructed structures

The soil conservation structures have four (4) functions of i) turning flood into safe flow, ii) preventing further erosion, iii) promoting vegetation recovery, and iv) preventing loss of soil moisture. Table 2 shows the set target values and the evaluation results for each of these functions of the structures.

Figure 1 shows the cross section of protection structures for waterways using tires – the section in the longitudinal direction of waterways. The tire structures will be put on waterways in a certain interval – 30 to 60 meters depending on the slope. Photo 1 shows the situation of the completed tire structure immediately after the severe flood which occurred on 3 March 2006.

Table 2 Evaluation results of the functions of constructed structures

Function of structures	Target value	Evaluation result
Turning flood into safe flow	[To be evaluated from the degree to which the impact of erosion is alleviated.] Protected farm land and constructed structures are not eroded by a flood of once in ten years so severely as the functions of structures and the farming activities are damaged.	Photo 7.6-7 below shows that the combination of tires and grasses can be evaluated as effective for protection of waterways. However, the effectiveness shall be re-evaluated after the grasses grow on the whole surface of waterways and the protection by tires and grasses is completed. In addition, the effectiveness of the combination of storm water banks, contours, waterways, fences and planted grasses and trees for alleviation of erosion shall be evaluated after the whole designed structures are completed and the farming and maintenance activities start.
Prevention of further erosion		
Promotion of vegetation recovery	[To be evaluated from the degree to which the vegetation is recovered.] Grass coverage of the target area except for actual cultivation land – around 40% [1)]	The degree of vegetation recovery and soil moisture retention cannot be evaluated at this moment because this is a long-term effect.
Prevention of loss of soil moisture		

NOTE: 1) Grass coverage was on average less than 10% in Mankotsana, less than 15% in Ga-Machacha, and 20% to 30% in Tjatane at the time of the baseline survey in November to December 2004.

The severe flood on 3 March 2006 eroded the constructed waterways deeply, and washed away almost all the constructed tire structures. Under these conditions, a few structures left stable against the flood were observed as is shown in Photo 1. If the favorable conditions that tire jointing and soil backfill are done well, and that grasses grow to a certain degree, are satisfied, the combination of tires and grasses is effective for protection of waterways. If this kind of structures is completed on the whole surface of waterways, the functions of the structures of turning flood into safe flow, prevention of further erosion, etc will be fulfilled to a satisfactory extent.

Photo 1 Situation of tire structures just after the flood on 3 March 2006 in Mankotsana - grasses has grown from seeds sown underneath tires, contributing to protection

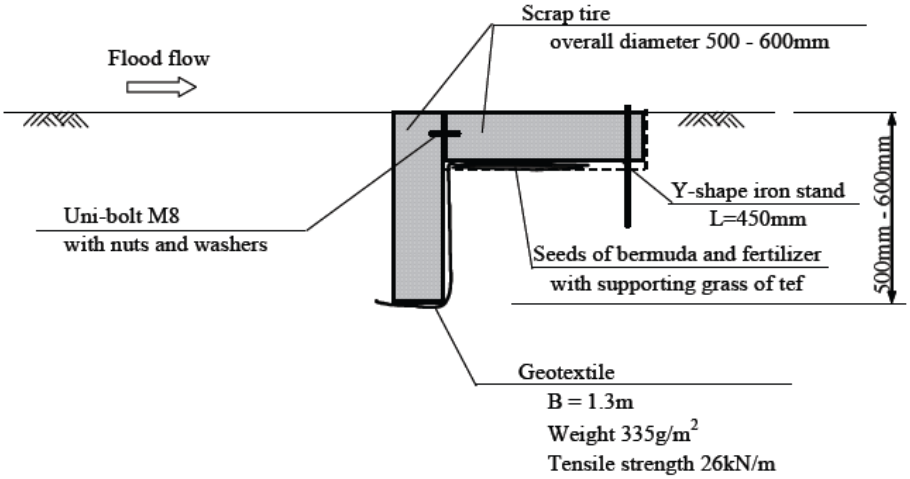

Figure 1 Cross section of tire structures for protection of waterways

b. Improvement of agricultural production

There are no actual achievements of farming activities and maintenance activities after completion of soil conservation structures; therefore, the degree of improvement of agricultural production cannot be evaluated at this moment. It shall be evaluated after the completion of structures and the start of farming and maintenance activities by the form shown in Table 3, based on the comparison between pre-implementation and post-implementation, and the comparison with the average data in Sekhukhune district

Table 3 Evaluation form of degree of improvement of agricultural production

Target community	Baseline data before implementation of project (production data before 2003/04 obtained from the survey on Dec. 2004)	Monitoring data after completion of project (production data after 2007/08 to be obtained by the survey after 2007)
Mankotsana	Sorghum 0.04~0.80ton/ha Millet 0.05~0.80ton/ha	Sorghum Millet
Ga-Machacha	Sorghum 0.05~0.14ton/ha Millet 0.05~0.14ton/ha	Sorghum Millet
Tjatane	Sorghum 0.04~0.96ton/ha Millet 0.06~1.00ton/ha	Sorghum Millet
Average data in Sekhukhune district (For reference)	Data in 1987-92: Sorghum 0.24~0.56ton/ha Millet 0.43~0.63ton/ha	

c. Communities' capacity building

Table 4 shows evaluation indicators for capacity improvement of the target community, and the results of the pre-project evaluation. Table 5 (1) shows the result of the questionnaire survey for the target committees and communities conducted half a year after the star of the project. Table 5 (2) is a form of a questionnaire for a post-project survey to evaluate change in institutional capacity of the target committees, which should have been done during the period of the Study. Due to variety of reasons, the Team could not conduct the post-project survey, and the Team does not have enough information to conclude this evaluation on the capacity building of the target community. However, the observation during the last field study in February 2007 gives us enough confidence to say that the communities' awareness of soil conservation activities has been actually raised just less than that makes them act proactively by themselves.

Table 4 Evaluation results of communities' capacity building

Target community	Before implementation of project – after participatory planning and designing (Surveyed in December 2004)	After implementation of project (To be surveyed after 2007)
Mankotsana	(1) Capability of acting proactively Evaluation: C The target communities cannot start activities without outsiders' instructions. (2) Understanding and awareness of, and motivation for soil conservation activities Evaluation: B Through the activities of transect walk in target areas and discussions, the target communities have learned the concepts and the meanings of activities and structures. However, they cannot propose the next actions, and they need outsiders' instructions.	(1) Capability of acting proactively (2) Understanding and awareness of, and motivation for soil conservation activities
Ga-Machacha	(1) Capability of acting proactively Evaluation: C The target communities cannot start activities without outsiders' instructions. (2) Understanding and awareness of, and motivation for soil conservation activities Evaluation: B Through the activities of transect walk in target areas and discussions, the target communities have learned the concepts and the meanings of activities and structures. However, they cannot propose the next actions, and they need outsiders' instructions.	(1) Capability of acting proactively (2) Understanding and awareness of, and motivation for soil conservation activities
Tjatane	(1) Capability of acting proactively Evaluation: C The target communities cannot start activities without outsiders' instructions. (2) Understanding and awareness of, and motivation for soil conservation activities Evaluation: B Through the activities of transect walk in target areas and discussions, the target communities have learned the concepts and the meanings of activities and structures. However, they cannot propose the next actions, and they need outsiders' instructions.	(1) Capability of acting proactively (2) Understanding and awareness of, and motivation for soil conservation activities

NOTE: Criteria of judgment for each evaluation item are described below:

A: Find out problems, work out measures and act proactively even without outsiders' advices
Have quite high level of awareness and understanding – always think of problems and next actions

B: Make arrangements to proceed with a set of actions in accordance with outsiders' instructions and advices
Have high level of awareness and understanding, but cannot think of next actions

C: Cannot start each activity without outsiders' instructions
Have low level of awareness and understanding – do not fully understand what activities and designs mean

Table 5 Results of questionnaire survey for committees and communities

(1) Baseline data from the survey in December 2004 – half a year after the start of the project

Questions	Answers		
	Mankotsana	Ga-Machacha	Tjatane
[For committees]			
Committee members	9 members, 4 male members of 40s to 70s and 5 female members of 40s to 60s	5 members, 2 male members of 20s and 3 female members of 20s to 30s	8 members, 3 male members of 30s to 50s and 5 female members of 20s to 40s
Frequency of committee meetings	6 times in July to November	Once a month	6 times in July to November
Frequency of community meetings	4 times in 6 months, 50 to 60 attendances	None	Once in 6 months, 50 attendances
Recording of meetings	Recording date, agenda, etc	Recording date, agenda, etc	Recording date, agenda, etc
Constitution of committee	Not having constitution	Having constitution	Not having constitution
[For communities]			
Profile of respondents	33 persons in total 14 men, 3 out of them younger than 40s, 11 older than 50s 19 women, 4 out of them younger than 40s, 15 older than 50s Area of farm land: 1ha to 5ha/person Cultivated crops: sorghum, millet, cow pea, ground nut, beans, melon, watermelon Income – pension only: 9 men and 7 women No income: 3 men and 12 women All cultivated crops – self consumption: 14 men and 13 women No cultivation: 0 men and 4 women	15 persons in total 14 men, 10 out of them younger than 40s, 4 older than 50s 1 woman, younger than 40s Area of farm land: 2ha to 6ha/person Cultivated crops: sorghum, millet, cow pea, beans, melon, watermelon Income – pension only: 5 men and 1 woman No income: 9 men and 0 women All cultivated crops – self consumption: 7 men and 0 women No cultivation: 7 men and 1 woman	40 persons in total 21 men, 7 out of them younger than 40s, 14 older than 50s 19 women, 14 out of them younger than 40s, 5 older than 50s Area of farm land: 0.5ha to 10ha/person Cultivated crops: sorghum, millet, cow pea, beans, melon, watermelon, vegetables Income – pension only: 4 men and 1 woman No income: 17 men and 18 women All cultivated crops – self consumption: 14 men and 13 women No cultivation: 4 men and 3 women
What do you think about situations of soil erosion?	Gradually getting worse, dongas being expanded and newly formed	Gradually getting worse, dongas being expanded and newly formed	Gradually getting worse
What activities relating to soil conservation would you like to participate in?	Agro-forestry, afforestation, construction of gabions, construction of contours, construction of earth dams, planting along dongas	Agro-forestry, afforestation, construction of gabions, planting sisal along dongas, construction of contours	Agro-forestry, afforestation, construction of fences, closing of dongas, collecting stones for gabions

Questions	Answers		
	Mankotsana	Ga-Machacha	Tjatane
What do you expect from project?	Increase of yield of crops, improvement of land management, stabilization of soil, reduction of soil erosion, creation of job opportunities	Increase of yield of crops, prevention of soil erosion	Increase of yield of crops, fencing of cultivable areas, afforestation, improvement of situation that land is divided by dongas
Are your activities able to solve problems of soil erosion?	Agro-forestry prevents further erosion, and fences protect vegetation from animals. Appropriate direction of ploughing prevents erosion. We can control flood direction and velocity properly. We cannot solve the problems because we cannot construct contours by ourselves.	Planting trees and grasses controls velocity of flood and reduces erosion. Fences protect vegetation from animals. We can eliminate flood.	Fences protect vegetation from animals.

(2) Monitoring data from the survey to be conducted after 2007 – three years after the start of the project

Questions	Answers		
	Mankotsana	Ga-Machacha	Tjatane
[For committees]			
Committee members			
Frequency of committee meetings			
Frequency of community meetings			
Recording of meetings			
Constitution of committee			
What roles have you played in your three year activities?			
What have you learned from your three year activities?			
[For communities]			
Profile of respondents			
What have you achieved in your three year activities?			
What have you not achieved in your three year activities?			
How has your motivation for soil conservation activities changed in these three years?			
What activities do you think are necessary in the future?			

d. Capacity building of the project staff members

Table 7 shows the result of the questionnaire survey for project staff members conducted half a year after, and two years after the start of the project. The project staffs' capacity building is evaluated from the results of questionnaire survey and observation, based on the criteria of judgment for each evaluation item shown in Table 6.

Table 6 Evaluation results of project staffs' capacity building

Evaluation item	Before implementation of project – after participatory planning and designing (Surveyed in December 2004)	After implementation of project (Surveyed in July 2006)
(1) Capability of making arrangements and acting proactively	Evaluation: C Project staff members did not have experiences of similar soil conservation projects at early stage of project, trying to deepen their understanding and acting in accordance with each instruction from outsiders.	Evaluation: between B and C As shown in the answers to the questionnaire, project staff members have improved prior planning processes. However, they still cannot act proactively, for example, in arrangements of study tours. An instruction is needed for each activity.
(2) Understanding of designs and processes, awareness of, and motivation for soil conservation activities	Evaluation: between B and C Awareness of participation in projects has been raised by participating in the community soil conservation project which adopted different approaches from past projects. Participatory activities using PRA methods made project staffs including extension officers motivated.	Evaluation: B From the answers to the questionnaire, project staff members recognize problems clearly, and have higher motivation for soil conservation activities. However, without instructions from outsiders, communication with communities tends to be less frequent. For example, when they see the situation of flood damage, they cannot think of next actions to be taken.

NOTE: Criteria of judgment for each evaluation item are described below:

A: Find out problems, work out measures and act proactively even without outsiders' advices
Have quite high level of awareness and understanding – always think of problems and next actions

B: Make arrangements to proceed with a set of actions in accordance with outsiders' instructions and advices
Have high level of awareness and understanding, but cannot think of next actions

C: Cannot start each activity without outsiders' instructions
Have low level of awareness and understanding – do not fully understand what activities and designs mean.

Table 7 Results of questionnaire survey for project staff members

(1) Baseline data from the survey in December 2004 – half a year after the start of the project

Questions	Answers
1. What has changed since you joined project staff team?	We have learned a new participatory approach of soil conservation project to let communities participate in the project from an earlier stage, and to let ourselves and communities participate in every aspect of the project. We have become strongly interested in community soil conservation project, and have come to devote our precious time to the project.
2. What are advantages and disadvantages of participating in the project in terms of your capacity building and increase of knowledge?	Advantages: We have learned communities' awareness and soil conservation approaches. Our skills for soil conservation projects have greatly improved. We have recognized the importance of preliminary study and feasibility study. We have recognized the effectiveness of PRA methods when working with communities rather than working for communities. Disadvantages: It took much time on processes of the project. We spent plenty of time in repeated meetings, discussion and communication with committees.

(2) Monitoring data from the survey in July 2006 – two years after the start of the project

Questions	Answers
1. What are advantages and disadvantages of these two year activities from the following aspects? (a) From the aspect of arrangements of activities	Advantages: We drew up a revised schedule every time we have to change the schedule due to unavoidable delay. We drew up neat plans and designs. We have a strict procurement system. Disadvantages: We sometimes received complaints from committees. We outsourced detailed survey and design. Soil conservation activities are not flexible, often causing delay, and as a result, incurring project cost increase.
(b) From the aspect of communication with target committees and communities	Advantages: We set a goal of communities' participation. We did well in motivating communities. Communities kept up participation and motivation even after the project proved to be delayed. Disadvantages: We had a difficulty in communication due to a problem of language. We had a difficulty in obtaining commitment from communities. Our commitment was at a low level at the beginning of the project. We had a delicate problem of land allocation. We had a difficulty in obtaining understanding from community leaders and community people. We had few younger and more educated participants.
(c) From the aspect of communication among project staff members	Advantages: It was not good at the beginning stage, but has improved gradually. We have a good task team members. Disadvantages: Our information was not shared with other LDA staffs and municipal staffs. We had a difficulty in gaining communities' understanding of technical issues.

Questions	Answers
2. What have been successful and what have been unsuccessful in these two years. (a) Successful matters	Project staffs', communities' and community leaders' awareness has been greatly raised. Many soil conservation projects have started in the target area. A unique model has been developed. Work and time for maintenance have been saved. Community has got better understanding of soil conservation. LDA has got better confidence. JICA has got best confidence.
(b) Unsuccessful matters	Our program often dragged behind by frequent revision of the schedule. LDA's procurement procedure was complicated. Unexpected severe flood occurred in Mankotsana. Our budget is limited.
3. What have you learned from these two year activities?	Complexity and seriousness of problems How we should motivate communities and obtain their commitment Advantages of adopted soil conservation methods verified from situation of structures left stable after flood PRA approaches we practiced Necessity of utilization of external experts
4. How have your awareness and capability changed? (a) Awareness of importance and necessity of soil conservation	We have come to know current situations of Sekhukhune area much better than before.
(b) Technical knowledge on soil conservation	Our awareness has been raised. We have got better understanding of flood runoff patterns.
(c) Management capability relating to project implementation	We have improved processes of prior planning, led by external experts.
5. What kind of projects would you like to participate in in the future?	Improvement of livestock production → fencing, securing of water, rotation of grazing – Land Care Water harvesting, low-input agricultural production
6. How would you like to make use of these two year experiences in future projects.	Utilization of improved facilitation skills Utilization of PRA methods Working on similar new projects, spending much time Combination of information from other sources and knowledge /techniques we have got in these two years

e. Economic effects/outcomes

Based on input to work and activities at the implementation stage, input to activities at the maintenance stage, and benefits from increase of income by improved farming activities, the economic effects/outcomes are calculated. At present, because there are no actual achievements of maintenance and farming activities after completion of the whole designed system, the economic effects/outcomes of the project cannot be calculated.

(3) Comparison with past examples

a. Efficiency

Table 8 compares the characteristics and the project cost per unit area between the community soil conservation project, and Figure 2 illustrates the unit project cost of these projects. The project efficiency is evaluated by comparing the input to these projects, assuming that the level of the output from the projects – the level at which functions of soil conservation are fulfilled – is nearly equal.

These projects can be categorized by the ranking of efficiency as follows: i) Ga-Machacha community soil conservation project of lowest efficiency, ii) existing Geen Einde, Koringkoppies and Sekgopo soil conservation projects of lower efficiency, iii) Mankotsana and Tjatane community soil conservation projects of higher efficiency, and iv) existing Makgoba and Boekenhoutlaagte soil conservation projects of highest efficiency.

Out of existing soil conservation projects, for Geen Einde, reliable project cost data are not available. However, in consideration of the fact that Geen Einde project has lots of large structures, and that the implementation period is quite long, it is considered that a huge amount of cost has been spent in this project. Furthermore, the administrative procedure for securing fund, the sources of which are Land Care budget and the budget for the LDA engineering section, has taken plenty of time. The efficiency of this project is quite low.

Table 8 Comparison of characteristics and costs of soil conservation projects

Project	Period	Area of target site (ha)	Catchment area (ha)	Slope (%)	Project cost per unit area (R/ha)	
					Total	Excluding equipment cost
Community Soil Conservation Project						
Mankotsana	2004 - 2007	383	943	2 - 4	14,222	9,376
Ga-Machacha	2004 - 2007	134	285	3 - 7	38,925	19,918
Tjatane	2004 - 2006	576	1,000	2	9,543	5,210
Existing Soil Conservation Projects						
Geen Einde	1992 - 2003	300	N.A.	2 - 3	N.A.	-
Koringkoppies	2001 - 2003	100	100	N.A.	18,211	-
Sekgopo	2002 – on-going	900	900	N.A.	11,244	-
Makgoba	1993	N.A.	N.A.	2 - 3	N.A. (40,000 in total)	-
Boekenhoutlaagte	1993	91	N.A.	2 - 3	N.A.	-

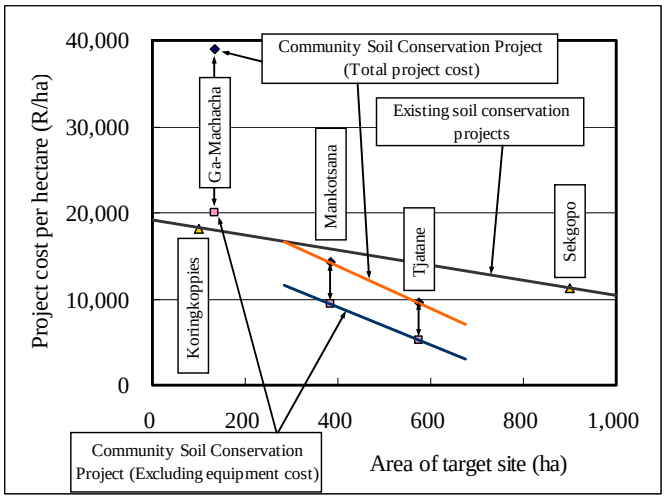

Figure 2 Comparison of soil conservation project cost

For Koringkoppies, the expenditure was huge as compared to the project size. A large amount of fund was spent in construction of gabion structures. For Sekgopo, a large amount of fund was also spent in construction of large-scale gabion structures. The efficiency of these projects is low.

For Makgoba and Boekenhoutlaagte, accurate data of areas and project costs are not available. These projects were completed at least cost by LDA staff's easy work because the target areas of these projects are of gentle slope and of flat ground. The efficiency of these projects is very high.

Ga-Machacha community soil conservation project targets the area of steep slope; therefore, the number of soil conservation structures in this project are very large, and its unit project cost is the highest. The efficiency of this project is very low.

Target sites of the projects at Mankotsana and Tjatane are relatively gentle slope, and do not have large-scale structures; therefore, these projects have better efficiency compared to Geen Einde and Sekgopo. These projects were often suspended due to delay in administrative procedures and damages by flood, but the efficiency of them is not worsened so much.

Table 9 summarizes the characteristics of target areas and protection structures for several typical soil conservation projects.

Table 9 Comparison of characteristics of soil conservation projects

	Efficiency: very low (Ga-Machacha)	Efficiency: low (Geen Einde, Sekgopo, Koringkoppies)	Efficiency: medium (Mankotsana, Tjatane)	Efficiency: high (Makgoba, Boekenhoutlaagte)
Characteristics of target area	Steep slope (3% to7%) No large and deep dongas and lots of shallow dongas distributed	Relatively gentle slope in Geen Einde, and steep slope in Sekgopo Targeting lots of large and deep dongas	Relatively gentle slope (2% to 4%) No large and deep dongas and lots of shallow dongas distributed	Gentle slope Small erosion distributed
Characteristics of protection structures	Using tires	Using tires and huge volume of stones in Geen Einde, and using stones in Sekgopo	Using tires	No protection structures needed because of gentle slope Protection by natural vegetation only

Judging from the above table, it is considered that the following factors contribute to the improvement of the project efficiency.

1) Selection of target areas

To select a target area of gentle slope where shallow dongas are distributed.

In case a target area of steep slope where deep dongas are distributed, then the structures

become bigger, the project cost increases, and the efficiency becomes lower.

2) Selection of materials for protection structures

To select materials, such as tires, which can be easily procured and easily handled.

In case stones are used as materials for protection structures, then collection of stones takes time and cost, it is difficult to handle stones, construction of structures takes time and cost, the project cost increases, and the efficiency becomes lower.

In addition to the comparison of the input, several important points to be considered in the evaluation of the efficiency are as follows:

1) As is mentioned in "7.6.3 Process of the Implementation," the community soil conservation project was often suspended due to occurrence of flood and delay in administrative procedures. The delay in administrative procedures including securing of fund is a common problem to existing soil conservation projects. It is indispensable to deal with the problems of administrative procedures and risks of flood in order to improve the project efficiency.

2) In the financial year 2004, earthmoving machines owned by LDA, including graders, dozers and tractors, were used in the construction work, and this made the construction cost lower. However, from the financial year 2005, because the earthmoving machines owned by LDA had become out of order, the equipment was hired from the private sector. Tractors can be rented from neighboring farmers at low price, while graders and dozers have to be rented from private leasing companies. As a result, the project cost increased.

The ratio of equipment cost in the total project cost for each site is indicated below. The use of LDA-owned machines can save 30% to 40% of the project cost. It should be considered which is economical from a long-term perspective for LDA to own the construction equipment or to hire it from the private sector.

Table 10 Comparison of expenditures of the soil conservaton projects

Financial year	Item	Project site			Total
		Mankotsana	Ga-Machacha	Tjatane	
2004 to 2006	Total project cost	R 2,692,000	R 3,243,000	R 5,497,000	R 11,432,000
	Equipment cost	R 895,000	R 1,541,000	R 2,496,000	4,932,000
	Ratio	33%	48%	45%	43%
2007 (Expected)	Total project cost	R 2,755,000	R 1,973,000	-	R 4,728,000
	Equipment cost	R 961,000	R 1,006,000	-	R 1,967,000
	Ratio	35%	51%	-	42%
Total	Total project cost	R 5,447,000	R 5,216,000	R 5,497,000	R 16,160,000
	Equipment cost	R 1,856,000	R 2,547,000	R 2,496,000	R 6,899,000
	Ratio	34%	49%	45%	43%

Makgoba and Boekenhoutlaagte projects are examples in which the construction was completed by easy work with LDA owned machines. Because the internal resources of LDA are limited, the use of external resources is indispensable. However, it is needed to use internal resources as much as possible in order to improve the project efficiency.

3) From the financial year 2005, each extension officer has participated in various programmes and projects more often than before, and as a result, each of them has participated in the community soil conservation activities less frequently. The extension officers play an important role in participatory activities and communication with communities. Therefore, it is needed to improve the circumstances of their extension activities for their capacity building – for example, to coordinate extension officers' activities between community soil conservation and other programmes or projects. The improvement of the circumstances of extension activities will contribute to the improvement of the project efficiency and effectiveness.

b. Sustainability

Existing Geen Einde, Makgoba and Boekenhoutlaagte soil conservation projects are examples in which communities' maintenance activities are not sustained. In consideration of this situation, the "community soil conservation project" was planned, designed and implemented, aiming at promotion of participatory activities and encouragement of communities' and government staffs' proactive participation. However, there are no actual achievements of maintenance activities at this moment. Therefore, it cannot be evaluated at present how the promotion of participatory approaches has contributed to the establishment of sustainable maintenance system.

c. Effects/outcomes

Table 11 compares the effects/outcomes of several soil conservation projects. Compared to the existing soil conservation projects, the community soil conservation project has been improved from the aspects of design and maintenance system building. Therefore, it is expected that the community soil conservation project will bring a certain effect from the aspects of fulfillment of functions of structures, alleviation of flood damages, improvement of agricultural production, and sustainability of maintenance systems.

Table 11 Comparison of effects/outcomes of soil conservation projects

Project / Effect/outcome		Existing soil conservation projects				Community soil conservation – Mankotsana, Ga-Machacha, Tjatane
		Geen Einde	Koringkoppies	Sekgopo	Makgoba, Boekenhout-laagte	
Fulfillment of functions of structures Alleviation of damage by erosion	Turning flood into safe flow	Gabion structures and vetiver grasses, designed to interrupt flood flow, help further erosion, and expected effects are not seen in some places.	Gabion structures are partly damaged by flood, but the structures are as a whole functioning well.	The construction work is not completed yet, but structures as waterways, gabions, contours, etc are functioning well for turning flood into safe flow and prevention of further erosion at this moment.	In Makgoba, structures as waterways, contours, etc are not maintained properly, so erosion has partly started around waterways.	After the flood which occurred during construction work, the situation that combination of tires and grasses function well for protection of waterways was seen. Protection of waterways by tires and grasses as well as flood control by banks and contours shall be evaluated after completion of the whole designed system.
	Prevention of further erosion					
	Promotion of vegetation recovery	Tire structures contribute to soil moisture retention and vegetation recovery in upper areas.	Fences contribute to vegetation recovery in the target area.	At present, clear effects have not appeared.	Structures are not maintained well, but grasses on waterways are maintained well.	At present, clear effects have not appeared.
	Prevention of loss of soil moisture					
Sustainability of maintenance Improvement of agricultural production Improvement of agricultural productivity		Grazing land management is not good. For example, part of fences are left damaged, and areas with expanding erosion are left as they are. Also, committee's activities are not active. Future proper management is needed so that recovered vegetation may not be lost again.	Part of irrigation area has soil of low fertility, but productivity has improved to a certain extent.	Agricultural production has partly just started, and clear effects have not appeared at present.	In Makgoba, improper maintenance and small erosion are seen, but erosion does not limit farming activities at present, and productivity has improved. However, it is not guaranteed that this situation will be sustained. In Boekenhout-laagte, cultivation land is abandoned, and constructed structures are not utilized now.	There are no actual achievements of farming activities, so change of agricultural production cannot be evaluated.

Chapter8 Lessons of PRIDE (Participatory Rural Integrated Development in Sekhukhune)

8.1 0.1ha Integrated Farming Project

The following are the lessons from the 0.1ha Integrated Farming Project

(1) Even under adverse circumstances, small-scale farms work.

Even in the target area under adverse circumstances where water, capital, and farm experience are lacking, small-scale farm system mainly cultivating vegetables work well both biologically and economically as long as the minimum necessary water is secured. Integrated farming has a major positive impact by introducing poultry unit to improve the soil fertility of vegetable farms with the manure compost.

(2) The size of a farm field should be adjusted based on the quantity of water available.

Major problem of the participating farmers who were not able to grow vegetables well was shortage of water. In semi-arid areas such as the target area where water is the most important limiting factor to agricultural development, securing the minimum necessary water for irrigation should be a precondition for starting the small-scale integrated farming. If this precondition cannot be met, the farm must be downsized according to the amount of water available.

(3) Manure compost can help improve soil fertility.

Manure compost from chicken as well as crop residue and grass can improve soil fertility and greatly help vegetables grow. In Radingwana before the start of this project, soil was so hard due to continuous use of chemical fertilizers that it was difficult to grow root vegetables. But two and a half years after the start of manure compost application, soil became soft. Now a metal stick sinks about 20 cm into the ground even with a gentle push.

(4) Before expanding the scale of a farm, it is necessary to increase the production per farm.

The pilot project showed that the annual net benefit of the small-scale integrated farming model is about SAR 6,500. It amounts to approximately 80% of the average annual per capita income in the target area. Nevertheless, the productivity of the farm is still less than 30% of the average productivity in RSA, indicating that it is still possible to increase productivity further by improving soil fertility and cultivation techniques. Thus increasing the productivity, or production per unit area, is a more immediate goal than expanding the physical scale of a farm.

(5) It is possible to sell products outside communities.

If means of transportation are secured, it is possible to sell vegetables outside communities as the demand for vegetables in the target area is quite large. When Radingwana group sold vegetables outside communities, the selling was done in one of the following two ways: either (1) traders at pension-pay-points came to buy them; or (2) the group asked those who owned trucks in communities to help ship vegetables to outside areas.

(6) Capacity building of farmers begins with a chain of small successes.

In all farm undertakings including poultry, animal feed production, improving soil fertility, vegetable cultivation, and selling farm products, there are many small steps that must be taken through. To build the capacity of farmers, it is essential to let them experience a series of small successes by having farmers accomplish necessary steps while paying attention to the farmers' environment and the level of experience they have had. It is particularly important to have the farmers feel at an early stage that their undertakings are manageable, interesting and profitable.

(7) There is another option to run small-scale farming that grows only vegetables.

If unused manure of cows and goats can be obtained, then it is possible to put together a simple farming model that creates manure compost and uses it to grow vegetables without resorting to integrated farming that includes poultry unit. Farmers can learn how to prepare manure compost through simple training. In fact, the effect of the manure compost was verified by individual farmers who were trained in 2005. With farming that grows only vegetables, although it is not possible to obtain chicken manure that is rich in nutrients useful for vegetable and fruit cultivation such as phosphate, a major advantage of this alternative is that it incurs no risks and work whatsoever related to poultry.

(8) While it is difficult to grow feed grains, it is possible to cultivate sunflowers.

As for the pilot project, due to lack of rainfall and damage by birds, most attempts to cultivate poultry feed grains such as sorghum and millet have failed. On the other hand, even with very little rain, many participated farmers managed to grow sunflowers successfully. Sunflower seeds, which are sources of both calories and protein, are very expensive in markets. By growing sunflowers systematically, it would be possible to save the cost of animal feed by 30 to 50%. Sunflower feeds may also be used as protein sources for other animals in semi-arid areas.

(9) Farmers can produce sources of animal protein on their own.

To secure alternative sources of animal protein which is very expensive in markets, the participated farmers cultured fish and earthworms. Upon introduction of tilapia fry and young earthworms, it is

possible even for relatively inexperienced farmers to culture fish and earthworms as long as they grasp a few technical matters. Supply of protein to animals, especially chickens, is always an issue in many semi-arid poor regions, and fish and earthworms may provide a solution to it. However, it takes up to 2 to 3 years until fish and earthworms reproduce themselves to a sufficient quantity for continuous feeding to animals. Thus it is necessary to secure many fry and young earthworms in the beginning to shorten the preparation period, while obtaining other sources of protein.

8.2 Livestock Owner Group Support Project

The following are the lessons from the Livestock Owner Group Support Project.

(1) Finding and cultivating people with leadership skills is a key to success of a development project.

Even some in LDA were of the view that a participatory approach would not work in a harsh environment such as the target area. However, this pilot project proved that participatory development is possible even in a difficult environment as long as appropriate methods are employed. One of the most important matters in carrying out a participatory approach is to foster the right leadership in a group. It should be clearly understood that the so-called traditional chiefs and the political leaders are not necessarily appropriate leader in small farmer development projects. Leadership in a development project often emerges in a group by proper facilitation from the outside and should be nurtured appropriately.

(2) There is still potential to recover rangelands.

Through protection of the demonstration site in a pilot project on an experimental basis, it became clear that plants for animal feed survive even in lands that look wasted through overgrazing. These plants survive in places that animals can not reach such as areas around the roots of shrubs. By protecting these plants in a proper manner, it is possible to significantly improve the productivity of the field. It is especially effective to let the field rest during the rainy season. To realize tangible improvement of the productivity of the currently damaged rangeland, such protection during the rainy season may be necessary for 7 to 8 years in a row.

(3) Water harvesting is effective for small-scale production of fodder production.

By water harvesting, the participated livestock owners were able to draw water from flat places such as housing roofs, roads around them, and ground in various premises, and collect enough water for use for four weeks. This amount of water is sufficient for cultivating annual crops that need a

relatively short time until harvesting and perennial crops that are relatively resistant to dryness. From 2004 to 2005, the annual rainfall in Mphanama was only 170 mm. But the farmers who took part in this project were able to harvest enough crops from cowpea (an annual crop), Napier grass (a perennial crop), and Moringa. Water harvesting can help partially replenish water in soil during the dry season.

(4) The productivity of village chicken can be improved.

The pilot project proved that low cost interventions including a simple chicken shed, regular vaccination, proper watering, minimum supplemental feed and better care during early stages of chicks can realize a remarkable improvement of productivity. The village chicken is productive and could contribute under low management systems SAR 4,000/annum for a flock of 10 hens and a cockerel.

8.3 Community Forestry Project

The following are the lessons from the Community Forestry Project.

(1) It is too optimistic to expect that community people naturally understand benefit of forest.

Leaf of some legume trees can be used for animal feed. Plantation of trees will provide closer access to firewood. The team tried to explain these and other benefits of woodland and plantation to the target groups in several occasions. However, it may have been too optimistic to expect that they would be motivated toward plantation activities. Most of them spent their life only after the vegetation of the area has already been depleted, and it might be beyond their imagination that woodland or plantation would actually benefit them. If there had been some elder members in the target group, who personally experienced and enjoyed benefit of woodland, things might have been different. Mobilization of community for forestry project in the future should take this concern in account.

(2) The combination of public work approach and livelihood development component is realistic.

Considered the above mentioned conditions, first 5 to 10 years of a forestry project should be guided by a relevant government agency so as to maintain momentum of activities even with a little shaky willingness of community people. During this period, two possible incentives can be given to target communities. One is the procurement of tree seedlings from community nursery, if available, and

another is hiring of community people for planting work. These seems to be less "participatory" approach, however, more important issue during the initial stage of forestry project is how to keep them involved in the activities.

Another possibility is combining forestry activities and broad based livelihood improvement activities. One example exists in India where the government has adopted "Joint Forest Management (JFM)" as its basic approach of forestry projects. Primal aim of JFM is rehabilitation and conservation of their state forest. Under the JFM framework, the government and a community share future economic benefit form the state forest such as timber sale, and also the government allows the community to use the non-timber-forest-products from the forest. JFM also facilitate a revolving fund for development of social infrastructure in the village, or micro-credit for income generation activities of the community members. As a whole, JFM tries to give short-term benefit to the community members enough to make them motivated toward the protection of the state forest. The reason why Radingwana group could continue the activities and Ga-Kopane group could not has the similar underlying principle that the former could get some income from their nursery and the later did not.

(3) Nursery business development requires prior confirmation of market potential and capacity development of the target group on marketing and business negotiation.

If a forestry project combines plantation and community nursery business, profitability of the nursery business is crucial to maintain motivation of the target group members. Therefore, careful market study should be done before starting any activities. In the reality, private demand for tree seedling in semi-arid rural area is negligible, and most of the hope comes from the public sector. A community nursery has to be prepared in many aspects including stable production, proper stock management, communication and negotiation ability, and others. External support agency should be aware of this challenge and necessary capacity building should be accompanied with development of a community nursery.

8.4 Practical Farmer Training Project

The following are the lessons from the Practical Farmer Training Project.

(1) Youth in the area are positive about agriculture.

Despite the team's anxiety that the youth in the area may not be interested in agriculture, this project attracted quite a number of young people, and most of them completed about a half-year programme

of training. It is considered that the problem is not the youth themselves, but the method of announcement or recruitment. If a right method is taken, we can meet a lot of young people looking for the future of local agriculture.

(2) Technical support should be accompanied by initial funding support.

Originally this pilot project was focusing only on training, and the team explained this focus to all the relevant stakeholders from the beginning. Despite that, the team still received many voices to request after support such as assistance to obtain farm land and provision of infrastructure materials. The team now understands that training itself is not enough. Especially when agricultural development in a poverished rural area is the objective, integrated support including all three aspects of "technology," "capital" and "management" is indispensable.

(3) "Farmer to Farmer" extension is a considerable possibility

After the initial try and error, this project proved that leading local farmers can be "mentors," and that knowledge, skill and experience can be transferred and/or shared between farmers. This "farmer to farmer" approach has at least following two merits: 1) a mentor farmer can teach according to reality of local conditions, and trainee can understand better and more realistically, 2) trainees can, if necessary, visit the mentor farmer even after completion of training.

(4) Mentor farmer can be a partner of LDA

The mentor farmers voluntarily participated in the pilot project without any reward or any promise beforehand. This project has considered possible benefit to the mentor farmers, unfortunately however, nothing came to reality. Mentor farmers are potential partners for LDA to strengthen its extension system, and to have them involved in the system, proper reward should be provided to the mentors.

8.5 Women Businesses Promotion Project

The following are the lessons from Women Business Promotion Project.

(1) Small-scale business is profitable, if designed properly

The small-scale, traditional home-made style, bakery business is profitable. The products attracted many customers, and made good sales. This experience tells us that once differentiation of product and market is well established, small-scale business can compete with larger business entities and make profit. In this case, most of the bread consumed in the target area comes from commercial

bakery firms outside the area, which means this traditional home-style bakery still have a large room of potential market which can be taken over from the commercial bread. From the macro economic point of view, alteration of commercial bread by local bread means more than just the development of bakery business. Once the local product replaces the imported product, more capital would be accumulated in the area and the area would have better potential for further economic development.

(2) Traditional method and technologies have important merits

All the ingredients of the bread and doughnut are available in the target area. No electricity is necessary and just mud or brick is enough to make an oven. One of the most critical issues of small-scale business development is how to keep the initial and recurrent costs low. Use of traditional method usually is resulted in low cost. It also enable the most of ordinal people learn the method easier. These are the important merits, which make traditional method and technologies the first choice of small-scale business development.

(3) Management of groups is the key to success.

Except individual business, outcome of group management directly affect their business, regardless of the quality of their products or of the smartness of their marketing strategy. Strong leadership is not enough to maintain a group, but it also requires other elements including information sharing, clear demarcation of role and responsibility and clear and proper decision making procedure. It turns out that information sharing or transparency on accounting is especially important.

(4) Assistance for small-scale business should be given step by step.

Proper support to a small-scale business group should be given at a right time. The business group develops their capacity along with the development of its business. Assistance should be given according to the level of business development as well as development of confidence of the group. Step by step support is also important to maintain sense of ownership of the group.

(5) "Grass root extension" should be tried.

This pilot project examined a process model in which "model groups" were assisted to be a partner of the team for promoting bakery business to other women groups, and it was proven to be effective. Moreover, some of the new group transferred their knowledge and skill to other groups without any intervention from the team. This implies that if a business model is practically profitable, extension occurs naturally among the people on the ground. It does not mean government extension is unnecessary; rather, possibility of complementary combination of government extension and this grass-root extension should be explored.

(6) The most important challenge.

The most critical issue of the traditional bakery business is fuel source. Currently, all the participated groups use firewood for the fuel. However, vegetation has been already depleted, and collection of fuel wood will be more difficult. Use of firewood itself is pressure on the environment. Coal may not be a practical alternative due to several reasons: difficulty of heat control, difficulty of procurement and its cost. Although it takes time, plantation of firewood trees may be the only practical solution to this challenge in the long run.

8.6 Community Soil Conservation Project

The following are the lessons from the Community Soil Conservation Project.

(1) Participatory planning can work even for the soil conservation project.

Participatory planning process using PRA method obviously raised the motivation and awareness of community members on soil conservation. In general, a project whose aim is rather long-term benefit such as soil conservation cannot attract immediate interest of local people, and thus it is generally believed that the adoption of participatory method is difficult for this type of project. Nonetheless, this pilot project showed that it can still work.

(2) Continuous communication with the community is necessary.

Participatory planning is not a goal, but just a start, and continuous communication with target communities should be maintained. During implementation period, whole variety of incidence happens, such as delay of procurement, flood, and others. It is natural for local people to be too preoccupied with a variety of concerns in their everyday life to worry about soil conservation. Therefore, in order to maintain interest and motivation of target communities, events raising their awareness such as study tours and cross visit between the target communities can be organized at appropriate occasions.

(3) Flooding can occur.

In Mankotsana, vetiver planting was damaged by heavy rain in December 2004 and all the on-going construction of soil conservation structure was destroyed by a flood in March 2006. They are force majeure, and construction schedule was not adversely affected by the time limitation of this project. Nevertheless, risk of flood damage should have been minimized as much as possible. Planting and waterway protection should have been scheduled right time so that they could be completed at least in the first half of the rainy season.

(4) From soil conservation to environmental conservation.

Committee members of Tjatane community expressed their interest in starting a community nursery, after they visited the Community Forestry Project group in Radingwana. Although the team could not fully respond to their interest, this suggests that once they are aware and motivated in one aspect of "conservation," it may further develop by itself. Soil conservation and the rehabilitation of vegetation are closely related, and these two aspects can be easily integrated in a project.

(5) New structure for soil conservation using tires and planting is effective.

The flood occurred in March 2006 destroyed all the structure in Mankotsana, however, there were some places where tires kept their positions. At those places, sowed grass already grew under the tires, which suggest that once grass grows properly, whole system will be functional and strong enough to hold even in a flood.

(6) Internal resources and external resources should be used effectively.

Construction machines of LDA were not workable in the second year of this project and there was no way other than hiring the machines from a private company, which resulted in increased cost of the project. Possession of machines requires maintenance and operation staff, and they also cost. Since both possession of machines and outsourcing have advantages and disadvantages, LDA should carefully consider which is the better in terms of economy and of its operational capacity.

(7) Improvement of efficiency in administrative procedure is one of the critical challenges of LDA.

Delay of LDA's administration, especially in tendering and procurement, is not just a problem of LDA, but also a problem for community people since the delay caused by the inefficiency could spoil the motivation and momentum of community activities. Therefore, it should be clearly understood that this issue is a very critical challenge for LDA as a public service provider.

(8) Extension system should be re-designed.

After satisfactory involvement of extension officers in the first year, involvement and participation of the extension officers drastically decreased in the second year due to conflicting mandates and activity schedules. In general, extension officers' activities are strongly influenced by new instructions from higher positions and donors. This is somehow unavoidable and it is unfair to blame on extension officers for this problem. The re-design of extension system and management procedure is an urgent task of LDA.

8.7 Mobile Information Unit Project

The following are the lessons from the Mobile Information Unit Project.

(1) People seek for information.

It was a common belief that agriculture was one of the most unpopular occupations in the target area, but this pilot project revealed that it was not true at all. Booklets and pamphlets brought by the mobile unit were taken away in a second every time. There is no further observation if they actually use the information gained from the mobile unit, however, still it is reasonable to judge that people in the target area are interested in agriculture and looking for information.

(2) Active information hub should be realized.

There are some information outlets in the target areas other than the mobile unit. Major ones are traditional authority offices and local municipal offices. At those places, announcement, advertisement and other information are posted on the wall, and communication officers may be waiting at his/her office for any persons to come. These information outlet may be referred to "static information outlet," while the mobile information unit is an "active information hub." It moves and carries variety of information time to time, and sometimes, it can be information outlet of farmers. This type of "active information hub" is a completely new information dissemination method, and this pilot project proved that this is well effective.

(3) Trust can be established on the ground of "routine work."

During the implementation of this pilot project, farmers sometimes used the mobile unit as a platform of information sharing. This can only happen if the mobile unit works regularly. Farmers anticipate the mobile unit comes as scheduled, and as they see the mobile unit, they feel closer to LDA. Then, some of them may plan to do something with it. Routine, or regular visit can build a trust between local farmers and LDA; this is another challenge of LDA.

Part 4 MASTER PLAN

Chapter9 Strategic Vision for Holistic Development

9.1 Introduction

Since the end of the apartheid era, the Government of South Africa has been trying hard in socioeconomic empowerment of blacks and raising their income. However, achievement of these policy goals is not easy. It is especially hard in areas such as Sekhukhune district that have underdeveloped social infrastructure and few sustainable employment opportunities. This study was meant to support the government's undertakings to reduce poverty in the target area, and was also to help create communities with economic and social capacities that could take charge of their own development in a proactive manner.

To achieve such objectives, in the first year of the study, the team surveyed the target area from various expert viewpoints and actively exchanged views with local people. The Interim Report that was distributed in February 2004 spells out the mission's findings in detail. In addition, the Interim Report includes proposals on eight pilot projects that arose out of the survey above.

For nearly three years from February 2004 to February 2007, in cooperation with the counterparts at LDA, the team did its best to implement the pilot projects that it had proposed. With the exception of the Local Governance Strengthening Project[1], the team believes that the other seven pilot projects accomplished various tangible results. Each of the pilot projects went through a process of trial and error with a number of unexpected events. However, the pilot projects as a whole achieved far more than that the team had initially expected, and the team was able to draw many lessons in a wide range of areas.

Chapter 7 and 8 described the activities, achievements and tasks ahead of the respective pilot projects. This chapter focuses on the findings of the team through implementing the pilot projects, and the team's proposals for development strategies based on lessons learned. Based on this study, the team is convinced that the target area can establish a proactive development process if patient efforts based on a proper development strategy continue. But on the other

[1] The Local Governance Strengthening Project did not work well for the following reasons: (1) The administrative capacities of Fetakgomo and Makhuduthamaga, two municipalities in the target area, were inadequate, and the JICA mission was unable to play a major role in the process of formulating IDP; and (2) the JICA mission was occupied with providing support to, and coordinating the work of, LDA that implemented the other pilot projects, and the JICA mission was unable to devote adequate human resources to this pilot project.

hand, it is concerned that the conventional way of doing things, i.e., putting more money into projects without grasping lessons so far correctly, will only deepen poverty and dependence on outside assistance.

Unlike other countries in Africa, the Government of South Africa is not dependent on development funds from donors. It also has the financial capacity to devote a large amount of its own development money to poverty-stricken areas, but is not necessarily capable of maximizing the effects of such money. On the other hand, the government has few opportunities to have its development strategy and approaches evaluated by outside parties and is thus unlikely to rectify shortcomings in its development policies. If the insufficiency of local governing capacities, an issue that the government believes is quite serious, becomes even more apparent, then the government may have to choose from two equally unappealing options: either let abundant funds not be used for development, or use funds the wrong way and end up producing a negative impact on development.

To make sure that issues raised in this chapter will not stay just superficial discussions on generalities, the team spells out here an overview of the Center of Excellence Project (CEP) as a specific project proposal. In the midterm seminar of this study, LDA made a basic proposal on CEP, and the team has been working on details of the proposal in consultation with LDA. Chapter 10 “Overview of CEP” describes CEP-related matters.

At the end of this Part 4 is Chapter 11, “Sekhukhune District Soil Conservation Master Plan.” The team believes that, given the district office’s manpower, skills and knowledge, it is unrealistic to expect the district office to take the lead in soil conservation activities as expert knowledge is essential in such activities. Thus the soil conservation activities are planned separately so that the LDA Head Office can implement them on their own.

9.2 Strategic Vision for Holistic Development

9.2.1 Visions for Integrated Development

The natural condition of the target area is harsh with low precipitation and worsening soil erosion and devegetation. Livelihood of the people in the area is seriously difficult. Majority of the people is deeply depending on the government welfare programmes. Agriculture is not an industry to support the economy of the area, or not even an economic activity to support the daily life of the people. Most of the people in the target area lack experience of self-reliant

producer of anything, and are out of the “first economy” for a long time. This is the reality we have to face, when we consider the improvement of livelihood of the people in the target area.

Applying its experience and findings in the pilot projects that the team has been vigorously implementing for the last three years, the team proposes defining the combination of the following three norms as a strategic vision for integrated development in the target area based on small-scale agriculture. The strategic vision indicates in which broad direction development activities should proceed in the future, and forms the pillars of the development strategy for the area.

- Growth: Generate economic activities to be self-reliant
- Equity: Ensure people’s participation to be confident
- Stability: Recover the ecological and social balances to be secured

(1) Vision for Growth

It is of utmost importance for the people in the area to secure means to earn incomes and stand on their own feet financially, rather than depend on various kinds of public grant. This necessitates, however, coordinated efforts to explore and exploit small but critical income generating opportunities that are now half-buried in local society. Despite seemingly poor development potential and multiple hindrances, the pilot project has proven that many income generation opportunities are available for the people in the area. Previous development initiatives tended to spend too little time to explore such opportunities on the ground. There is often no readymade solution for assistance to eradicate poverty. However, instead of carefully examining the situation by shedding light from various angles to find location-specific solutions, the government has tended to “teach” the people how to emulate perceived “modern and large-scale” ways of production, which seldom worked well under the local conditions.

In this context, it may not be an exaggeration to state that the local people have not been given adequate chance to experience their indigenous development in a form adaptive to their environment and to today’s economic reality. If “failure” is defined strictly, the local people have not experienced failures of development projects, since few of which came from their initiative. If the “failure” is a consequence of someone else’s suggestion, it would hardly bring about lessons and therefore would perpetuate itself. This would make people even more dependent, in terms of not just economics but of sprit. Nelson Mandela wrote in this autobiography:

"It was not lack of ability that limited my people, but lack of opportunity."

The same statement can be rightly repeated to pinpoint the core of problems plaguing the target area. Contrary to the widely held perception, the real culprit of failed development in the past was not the laziness of the people but rather the failure in the careful examination of indigenous economic opportunities by those who should indicate possibilities of development to the people. This should be replaced with organized efforts - as opposed to isolated and piecemeal attempts - to explore various development possibilities in the local context. The team would like to see the provincial government, municipalities, NGOs and the private sector work together with the local people in seeking opportunities for income generation by taking into consideration local potential and constraints.

The investigations of the team have identified potentially viable economic activities that the local people could carry out. Of course, as in any pilot project, assistance from the outside is at first needed in many cases so that local people can actually implement project activities. An example of such undertaking is the 0.1 ha Integrated Farming Project which was designed in full consideration of local people's favorable experience of community gardens. Another example is the Women Business Promotion Project which is aimed primarily at assisting rural women groups to earn incomes through food processing and other small enterprises. In this case, the team paid attention to one women's group of a small village which was running a traditional bakery with a considerable return. These pilot projects are just examples of such efforts; the more careful we are in investigation the more potential opportunities will be dug up.

The team believes that the top-down approach, which has been adopted by the government for many years, can hardly work when the people have yet to build confidence to venture into their own businesses. Their confidence can only be enhanced through a myriad of small successes; no matter tiny they are for other's eyes.

Any fancy planning with administrative jargons and buzzwords will be at best in vain and at worst anti-developmental. We believe that has been amply demonstrated in the past. In essence, the people and those assisting for their better lives must be brought home to the basics - without the base of indigenous development initiatives, no seed of further development can germinate. What is symbolized in the motto "Growth: Generate economic activities to be self-reliant" is the departure from widespread dependence on public grants and the recommendation to explore possibilities to earn incomes through alternative economic activities based on indigenous experience.

(2) Vision for Equity

The essential mechanism to secure equity for the local people should be enhanced community power and reliable municipality capability. It can be called “community empowerment.” Unfortunately, both the community and municipal governments of the target area are in transition and weak. They are often impotent to align people’s wish for and to discharge their energy on, development towards a fruitful end. Under current drives of the government for decentralized decision-making by democratically elected local leadership, the people’s voices are supposedly heard and adequately reflected in the formulation and implementation of development activities. However, the emerging reality does not fit this expectation, thus raising concern for ultimate disenchantment among the people with the new administrative structure and the visionary message attached to it.

This issue is closely related to the growth issue discussed above. There is a chicken-and-egg relationship. Since local initiatives are weak, more and more development projects are instituted from a top-down approach and since the development projects have been something given by the government or external aid organizations, sound local initiatives have never grown.

We need an alternative here, too. The alternative is a new norm that people should contribute considerably to development projects, thus converting the image of their being passive beneficiaries of development. People should gain the ownership of development projects with a clear-cut mechanism of staking their money, labor and time on the success and failure of projects. Of course, this does not mean that they can be left out in the cold without support. They should be supported as long as they committed to own projects. However, it should be remembered that development projects would remain, in reality, no more than self-perpetuating hand-outs without people’s strong sense of their interest being at stake.

From the very beginning of development activities, people’s participation must be secured on the ground, not on paper. People’s participation must be rigorously maintained even if it means sacrificing speedy implementation of projects and disbursement of funds. The participation of people is not an additional virtue of development but an essential element of development. One can easily understand that people’s participation is essential for successful development by imagining the preparation and implementation of any single development project. In this world, there is no such a thing as a project prepared and carried out in a silk-smooth way; every project faces some hindrance, happenings, complaints or confusion. Unless people are committed to the project, it cannot overcome these obstacles and advance further. In other words, the project will be fall at the first hurdle.

The team has found many committed communities while exploring pilot projects in the target area. After communities' own deliberations, many contributed to the implementation of pilot projects in a proactive manner. There seemed to be at least two reasons for such strong commitment from the communities. First, the team generally approached communities that strongly feel needs for certain activities and have good grass-root leaders. Second, the team made crystal-clear from the very beginning that the project would not proceed without the communities' promise of substantial contribution. The communities, of which no such commitment had previously been requested, were often taken aback at first. Some indeed could not reach consensus on the requested commitment while others lost interest in the pilot projects. But the team was very encouraged as many communities actively contributed to the implementation of the pilot projects until their completion.

With regard to empowerment, farmer-to-farmer training provides a useful lesson in a pilot project. PRIDE has utilized farmer-to-farmer training effectively in many ways. Such training gave pride and a sense of solidarity and accomplishment to both trainers and trainees, leading to their socio-psychological empowerment. The team suggests that farmer-to-farmer training be used more actively and strategically for development of the target area.

The team also initially intended to bolster the administrative caliber of the two local municipalities in the target area. Even in comparison with many communities in RSA that had been homelands in the apartheid era, the administrative capacity of the two local municipalities was inadequate. The municipalities are, for instance, still struggling to properly manage their own development planning to fit the policy framework of Integrated Development Plan (IDP). However, regardless of the administrative capacity of the two municipalities, the project implementation capacity of LDA was rather weak to begin with. Due to the combination of problems of individual staff members and the organization in itself, LDA's organizational capacity was time to time disappointing. From now on, a vision for the target area's development must be set with a sober and realistic assessment of LDA's capacity in mind.

(3) Vision for Stability

While the target area suffers from poverty and dependency, a new sort of crisis is quietly underway. The signs of environmental deterioration are increasingly apparent throughout the area and conditions have already developed to devastating shape in some communities. In every corner of the communities, including residential zones, farmland, rangeland and hilly areas, ecological imbalance and the lack of sustainability are evident.

Particularly, impending risks of water runoff and mud slide are becoming more serious in several communities. Residential areas and farmlands are now threatened by ever-expanding dongas. Dongas have reached to the fringes of school yards and residential blocks, causing immense and imminent threat to the safety of communities. The topsoil of farmland is constantly eroded, degrading the most important resource for agricultural development. Further, soil erosion causes sedimentation in water bodies. For example, Lepellane dam at the midpoint of the Lepellane River has almost entirely filled up, becoming not only useless but hazardous. We discussed the issue in Chapter 3.

Rangelands and hills that account for a considerable portion of the target area are under constant degradation caused by livestock overgrazing and by villagers excessively felling trees to get firewood. These bad practices have led to usage of rangeland being far below its potential. Although the environmental deterioration is steadily underway all over the area, the people seem unalarmed with these “familiar” problems. Unless the environmental problems are dealt with urgently and determinedly, they will begin undermining the very foundation of local economic development. Then, all ongoing and future developmental endeavors, including this study, will be nullified. How to regain ecological balance in the target area is also an important theme of this study.

In the social dimension, stability issue has another face. The gravest issue is no doubt HIV/AIDS which is rampant throughout RSA, but especially in poor black communities, both urban and rural. Although the budgetary and manpower constraints compelled this study to leave this issue out of its activity scope, the sober fact is that the target area is no exception in suffering much damage from the disease in many ways.

Another worrisome issue, albeit less imminent than the HIV/AIDS issue, is unemployment among the youth, which is naturally related to delinquency and crimes committed by young people. Although the target area is still relatively safe, the social environment will deteriorate over time if no effective action is taken to tackle the issue. The team implemented two pilot projects in this connection: one for training young farmers and another for disseminating agricultural information with the mobile information unit.

The former project was to support the first trial of practical farmer training targeted to unemployed youth, among which farming is said to be generally unpopular. The project was intended to alter the not-so-positive image given to farming, by providing various training opportunities to young people. The latter project was an attempt to directly provide rural people,

particularly to those willing to work, access to technical information on agricultural enterprises. These pilot projects showed that many young people are actually interested in farming. It is not just young people but also many small-scale young farmers who took interest in farming. Active measures should be taken to utilize and enhance their interest, which is a huge asset in local communities. While LDA's organizational capacity has room for improvement, the Agricultural Training Center is doing credible work. Thus such measures should be done as an important undertaking of LDA.

9.2.2 Five Analytical Dimensions of the Master Plan

To elaborate and transform into a workable master plan the strategic vision discussed in the previous section, the team reviewed the experiences of the eight pilot projects under PRIDE in a cross-sectional fashion and further analyzed them from the following dimensions: (1) Production Technology Dimension; (2) Natural Environment Dimension; (3) Economic Dimension; (4) Social Dimension; and (5) Political and Administrative Dimension. Analysis through the five dimensions helped shape a multi-dimensional master plan out of a conventional development plan.

(1) Production Technology Dimension

PRIDE took advantage of various techniques and approaches new to Sekhukhune. For example, in the Mobile Information Unit Project (hereinafter, "Information Unit Project"), the mobile information unit trailer equipped with videos and other equipment as well as the creation of education videos were all new techniques for the Sekhukhune District Office of LDA, while in the Community Soil Conservation Project, aqueduct protection structures made of tires represented a new technique for the LDA and contractors. The Practical Farmer Training (Practical Training Project) also attempted to use new training system that would have a sense of novelty for LDA employees.

The particular techniques that the farmers in the target area have been unfamiliar with (or had forgotten) thus far are wide-ranging, as shown below. PRIDE aimed to establish these practices through a process of trial and error.

<u>0.1 ha Integrated Farming Project (hereinafter, "Small Farming Project")</u>

Building a silage for chicken, raising earthworms, improving soil conditions using chickens, and raising tilapia

Livestock Owners' Group Support Project (hereinafter, "Livestock Project")
Water harvesting, chicken house, and the conservation of grazing land

Community forestry Project (hereinafter, "Forestry Project")
Nursery gardens, grafting fruit trees, and planting trees on wild land

Women Business Promotion Project (hereinafter, "Women Business Project")
Traditional earthen kilns (a technique that had been lost) and sweet buns

Community Soil Conservation Project (hereinafter, "Conservation Project")
Participatory rural appraisal and raising vetiver grass

Naturally, introduction of techniques did not necessarily go as intended in all communities. For example, in the Women Business Project, it was proposed that they try planting trees so that they could gather firewood, but this idea was completely ignored. Also, as with the use of coal to bake bread in the same project and the use of breeding chickens in the Small Farming Project, it was subsequently decided that these techniques were inappropriate or too difficult to use.

By and large, however, the farmers (the beneficiaries) at least were extremely interested in new techniques, and in almost all cases they were very accepting of these new techniques. They also showed a good understanding of the techniques. The trainees that were taught in the Practical Training Project were clearly very curious and intrigued, and gave no sign of unwillingness to accept the new techniques or take the easy way and avoid work. In light of this, it is certain that small farmers in poor and arid regions in the Limpopo province, as well as in the target area, are ready to actively take on "small technological innovations and the combination of techniques," which PRIDE has been promoting.

Indeed, there was even a sense that the administration tends to have a blind trust in large, modern production technology, overlooking small-scale and simple techniques and traditional techniques. In particular, they must recognize that extremely adverse conditions characterized by the absolute shortage of water and inadequate accumulated capital make it essential that small-scale agricultural development in Limpopo province lead to sustainable development. The farmers will be unable to compete against commercial farmers unless they develop simple and unique low-cost production techniques suitable to small-scale producers, rather than just a miniature version of the same production techniques used in much larger commercial farming. With this method, added-value is raised while keeping the scale small and costs down, not

quickly expanding scale and making major investments.

Not only is this kind of production technique more suited in social terms, but it also makes economic sense, as a simple calculation of the costs and benefits should show. Further, adopting such technology carries with it the significant merit of minimizing risks. Examples are improving soil conditions using chicken manure instead of a major input of chemical fertilizers in the small farming project, bread-making using traditional ovens rather than large electric ovens, as encouraged in the Women Business Project and building chicken sheds out of rubbish and branches as recommended in the Livestock Project instead of brand-new chicken houses. These PRIDE activities demonstrated the need to return to traditional concepts. A clever combination of small innovations, simple techniques and a re-evaluation of traditional techniques should become the key concept behind the technology needed for the province's semi-aidr small-scale agricultural development.

(2) Natural Environment Dimension

First, when devising a development strategy for the target area, we must keep in mind that the natural resources within the area fall into three very different geographical categories. Of course, the categories themselves depend on the criteria chosen, but the basic criteria in considering development in the target area are the geographical and hydrological features of the area. The A, B and C zones described in "11.3 Master Plan Framework" are examples of how the target area is categorized using this kind of criteria. Zone C including the upstream area of the Lepellane River and part of the Olifants River's catchment basin has the potential for small-scale irrigation. There are plans to restore the irrigation facilities here that are currently in disrepair. Zone B is the Lepellane floodplain. There are very few water resources, with water unavailable unless natural water is stored and wells are dug. Zone A encompasses the other type, which are primarily characterized by a steep range of hills and made up of mountain ranges and mountain areas with very little plant life. Zone A has very little potential for agricultural development, but preventing flooding and restoring plant life here is extremely important for the entire target area in terms of preventing soil runoff in the downstream areas in the future.

Not only does the target area have the lowest rainfall in all of Limpopo province, but plant life has been depleted due to overgrazing and excessive firewood gathering, making for extremely severe natural conditions. For this reason, the only areas that have almost certain potential for agricultural development are those in Zone C. Even in the small farming project the performance of the participating individual farmers was greatly affected by the water limitations. Nevertheless, if more farmers practice water harvesting so that the modest rain falling on their

premises and surrounding areas does not go to waste, the growth period for dry-season feed crops cultivated on a small-scale in backyards can be extended by three to four weeks, improving productivity in Zone B. The ability to practice water harvesting leads to major differences in productivity, such as the ability to raise chickens on a small farm.

Of course, it is essential to raise people's awareness of the environment's perilous state and take steps that will improve the target area's natural environment in fundamental ways, such as plant and soil conservation. The Conservation Project was started with the aim of meeting the community's desire to prevent dongas or huge ditches from expanding, but in the process a community got interested in creating nursery gardens and starting to plant trees. Of course, at the same time, the Forestry Project demonstrated that it was difficult for people who have never benefited from having abundant forests to want to plant trees from which they will not benefit until far into the future. It is a mistake to assume that changes in residents' environmental awareness are uniform across the target area, and indeed should be thought of as quite variegated. It probably would not take communities suffering from donga damage long to recognize the need for afforestation, but communities without this experience would probably be unable to understand the need for it.

As a general principle, we can conclude that during the initial stage of plant restoration in the target area lasting five to ten years, the government must take the lead in afforestation activities because the project must move ahead while it is not yet clear whether the community will become motivated enough to take the initiative. With this method, the government would hire the labor needed for afforestation from the community, and would also buy the plants from the community nursery. This is a more realistic process by which tree planting can go ahead while giving the community an economic motivation. If the residents were actually able to enjoy the benefits of the trees, afforestation would gain momentum as a social movement. The Forestry Project demonstrated that residents could take the initiative with the technical aspects of nursery gardens and tree planting. The next issue is whether this experience can help in starting a wide-ranging social movement.

Another method involves the integration of livelihood improvement projects and afforestation. For example, in India a program to restore national forests under the Joint Forest Management system has been successful. Under this system, the local government gives residents the right to use non-timber-forest products and dead trees from afforested land and also gives them half of the profits when the trees are sold as timber in the future. In addition, the government sets up a revolving fund to be used to improve livelihoods and village infrastructure. The thinking behind

this is that the revolving fund allows residents to enjoy the economic benefits sooner, thus ensuring that they remain motivated while waiting to receive future benefits from the forests. The forestry project in Radingwana succeeded in planting marula trees, albeit on a small scale, because a group of residents received cash income from the nursery garden, so in this respect was similar to the JFM in India.

The Livestock Project succeeded in working with the residents to fence off part of the grazing land on shared land to protect the plants during the rainy season and let the land rest. This experiment suggested that even if trees cannot be planted for some reason, as long as grazing land is appropriately managed, plant life including trees will be naturally restored, leading to preservation of the natural environment. In PRIDE, the afforestation carried out in the Forestry Project and the regeneration of the grazing land in the Livestock Project were separate projects, but their effect could be naturally enhanced if they were integrated.

Further, the Conservation Project was a pilot project started at the instigation of community residents, and achieved its results by encouraging them to participate as much as possible. Soil erosion had reached a severe state in the target region, and just as with green development through tree planting and natural restoration, this project would probably have to be carried out by the government as a public works given its technical aspects, while bring residents' own sense of initiative to the fore. Please refer to "Chapter 11 Master Plan for Soil Conservation in Sekhukhune District" for more information.

The harsh natural environment characterized by water shortages and its opposite, surface water run-off, owes its advent precisely to the failure to protect the natural environment. With the awareness that these factors pose major threats to small farmers' production, production and environmental conservation should be seen as two sides of the same coin.

(3) Economic Dimension

Needless to say, the direct benefit to the regional economy achieved by PRIDE would be extremely minimal. Even if all of the 10 or 20 small-scale community projects are successful, they cannot expect to achieve output that would actually have a social impact. However, the latent potential demonstrated by these pilot projects is not insignificant, and thus will be examined in detail here.

The results of a household expenditure survey conducted by the team in the target area in 2006 showed that maize was the main food with 60% of expenditures within this category, followed

by bread for 5%. Assuming that the average annual income of the approximately 40,000 households in the target area was SAR 8,000, the economic scale overall would be over SAR 300 million. Simple calculations based on data from the study suggest that the target area represents a large market equivalent to SAR 15 million for bread alone. Currently, large bread makers based in the city meet almost all of this local demand. However, the locally made bread that the Women Business Project in PRIDE prepared using traditional methods satisfied local preferences and proved that it was competitive enough. Accordingly, by increasing women's groups throughout local communities over the long term, there is a chance that manufactured bread could be gradually replaced by locally made bread.[2]

Similarly, vegetables could also be replaced with local produce. Tomatoes, onions and cabbage are all very popular, but potatoes are the most popular. Potatoes were not actively grown in the Small Farming Project, but given the market potential, potatoes are very promising. Since fruits and vegetables make up 6.3% of residents' diets, simple calculations similar to those performed for bread indicate that the potential market for fruits and vegetables is worth SAR 19 million in the overall target area.

Livestock products represent an even higher percentage of 9.4%. Of these, chicken meat is the highest at 5.3%. The average SAR 59 spent on chicken meat is equivalent to two live chickens. This can be more easily understood as one family eating two whole chickens a month. Calculating the market potential as with bread and vegetables indicates that the market for chickens is equivalent to SAR 16 million a year in the area, or about 700,000 chickens, demonstrating that there is considerable latent demand for chicken meat in the target area. Both the Livestock Project and Small Farming Project introduced the production technology needed to ship more chickens in meat form, and if this technology is developed smoothly it could make inroads into local markets and compete against commercial broilers outside the area.

Listing these figures side by side shows that sustained development of PRIDE could result in food products with an economic value of about SAR 50 million that could substitute for imports. These are just theoretical calculations, and there is no guarantee that they could be immediately carried out. However, these are no doubt important macro-economic targets helpful in determining the optimum goal for agricultural development in the target area.

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[2] This assumes that the women's groups would not run into any problems in the future in obtaining firewood needed to bake the bread.

Let us now see a micro-economic potential from the perspective of individual farmers. As discussed in “7.5 Women Business Promotion Project,” the bakery business promoted in the standard women’s project would generate sales of SAR 105 per day. In annual terms, this would be SAR 31,500. Since productivity could certainly be raised further, we can assume that each group could generate up to SAR 50,000 in sales per year. This means that if 50 women’s groups baked bread in each community of the regions, it could take over the SAR 2.5 million market for manufactured bread.

The successful Small Farming Project demonstrated that farmers could each raise their income by a net SAR 6,000 per year through the integrated farming. This does not amount to the average household income in the target area, but this is a major change given that it is not atypical for households live on less than SAR 6,000. If 1,000 farmers in the target area carried out small-scale integrated farming and locally produced potatoes could take over one-fourth of the local market, the production total would be SAR 6 million.

The Livestock Project also demonstrated that improvements in the productivity of 10 chickens at each firm generate the additional income of SAR 4,000 for the participating farmers. If all farmers achieved this level, even under a conservative assumption that the average profit would be half of this amount, the success of 3,000 farmers would result in profit of SAR 6 million.

The total of micro-economic targets is SAR 14.5 million. This is quite low compared to the SAR 50 million calculated as the macro-economic target. It can be considered that the SAR 14.5 million figure represents a feasible target while the SAR 60 million represents a theoretical target, with the fruit of future efforts determining the extent to which it exceeds SAR 14.5 million. The economic value of other items PRIDE works with such as fruit, seedlings, chicken eggs and farmed fish are not included in these calculations, neither do the figures include the economic value of the cattle that survive the dry season as a result of the rangeland management in the Livestock Project. When including these values, we estimate that the total economic benefit that could realistically be achieved by steadily developing and expanding several production models tested in PRIDE would be almost SAR 20 million in the target area alone.

The main issue is determining how best to market the target area’s produce in order to realize these latent economic benefits. Marketing must be considered pragmatically based on the area’s economic reality. Given the gaps in terms of technology and capital between the target area and external regions, a strategy promoting exports would not be appropriate in the near future at least. The residents in the target area pay SAR 150-200 million to external commercial farmers

and distributors to buy basic food items produced outside of the area. Given this situation, it would be more realistic for local farmers to focus on their own local market rather than trying to compete against powerful producers in markets outside of the area.

Nevertheless, in the medium term a strategy involving "brand farming" in which unique products based on the concept of "slow food" produced in the area are sold outside of the area. The slow food concept orients locally produced, often organic, food, emphasizing health and environment. The concept originated from Italy and is becoming widespread throughout the developed world, including RSA. If economic development can bring more prosperity to urban consumers and diversify their values, demand for slow food products will certainly increase. There is little price elasticity in the demand for these products, which could offset the modest transportation costs. More and more health-conscious consumers are becoming distrustful of mass-produced chicken and vegetables, and markets could welcome produce raised using traditional methods even if the price is high. Bread baked by women using traditional techniques is currently consumed by the community, but a taste test shows how good it is, and there could be potential in an interesting marketing strategy whereby the women work with local restaurants to send their bread directly to consumers.

There have been many cases in which "brand farming," originating in the 1960s, was used in rural development efforts in post-war Japan, as with the "one town one product campaign" that started in Oita prefecture in 1979. This strategy is still in use today. Almost all of brand farming examples share in common the leading role that residents play and the unique attempt to boost the village or town economy by utilizing natural resources in the area. Particularly important in this strategy are an environment and techniques that unearth a region's own resources and take full advantage of the community's knowledge. This "brand farming" concept could possibly be incorporated as a strategy in the future. A scarcity of water and farming experience and inability to produce on a mass scale may not be a fatal disadvantage. In particular, regions such as the target area, where prosperous urban markets are within one hour's drive, are the ideal economic environment for the "brand farming" strategy.

The team has mapped out the following four stages to divide the period until 2017.

Stage 1 Pilot stage corresponding to PRIDE (2004-2007)
Stage 2 Dissemination stage corresponding to CEP Phase 1 (2007-2009)
Stage 3 Expansion stage corresponding to CEP Phase 2 (2010-2013)
Stage 4 Brand farming strategy (from 2014)

Stage 1 was the period for this study, during which several pilot projects were carried out as development measures and the results were recorded. Pilot projects aimed to explore successful models although they could directly benefit only a few numbers of people.

In Stage 2, the LDA Sekhukhune district office will take the initiative in continuing with pilot projects so as to ensure those small farming techniques with the most potential, based on the output and lessons from the pilot projects. This is the objective of CEP Phase 1. The target area will double in size from Stage 1.

In Stage 3, other LDA district offices in Limpopo province will become involved, and successful pilot projects will be replicated and the activity area expanded significantly. There will have to be an increase in the numbers of projects and participating farmers. The community must take the initiative with help from stakeholders. Having come this far, residents' access to natural resources and greater control should result in visible signs of how their lives are improving. At the same time, the leading role in this development will gradually shift from external aid organizations such as LDA to the community, which should give the residents a greater sense of ownership over the development projects. In other words, in this stage residents will have a better ability to develop their communities and will take the leading role in development, while still receiving some aid from the government. It is also in this stage that development models can be expected to expand into the province overall and even throughout the country.

In Stage 4, the unique aspects of each farmer and community will be brought into focus and branded under "brand farming" strategy, based on all of the development experience that has been built up thus far. Communities can use their abundant labor force to compensate for shortcomings such as inadequate water and delays in building infrastructure, and produce goods emphasizing the environment, health and tradition that would appeal to wealthy consumers. This is a strategy that the entire region could aim for. Yet, the adoption of brand farming still appears farfetched, and it will look more realistic only when Stage 3 is successfully completed.

(4) Social Dimension

One important piece of information learned in this study was that if a farmer group formed with less than 15 members, direct communication between the members is effective and the group tends to be run relatively well. However, when groups have more than 15 and less than 50 members and could be more appropriately termed an "organization," in most cases technical instruction alone is inadequate and the organization requires considerable aid and constant

monitoring. If the number of members is over 50, making it a large organization, it is difficult to run smoothly without management help from external experts.

Nevertheless, farmer groups of less than 15 members do not necessarily function well. Rather, in many cases these small groups disintegrate or die out in course of time. It is essential to always back-stop with education in management techniques, such as leadership, clear goal-setting and record-keeping, and in addition, there are many cases that require external consultation on how to address the various problems that occur on a daily basis. Ultimately, almost all development projects will have group activities. However, since the local farmers are not skilled at running groups, when such group activities are required it is wiser to keep the number of members as low as possible.

One lesson learned from PRIDE was that “farmers’ skills are learned in a chain of experiences of small successes.” There are many small steps that must be learned, whether in raising livestock or growing vegetables. Multiple experiences of small successes in which farmers master each step help improve their skills. Unfortunately, however, most local farmers have not experienced small successes. This is because they live in rural areas and yet depend on government welfare programmes or remittances from their family, so they have little experience in farming even though they go by the name of “farmer.” Experiences of success give farmers the confidence they need to take the next step and challenge themselves to take up a new endeavor.

Their experiences also encourage many others in the community who had previously watched from the sidelines to act. In particular, it should be emphasized that PRIDE has been able to confirm that farmer-to-farmer training is an extremely effective methodology for disseminating technology. In the small farming project, the Livestock Project and the Women Business Project, the farmer-to-farmer training enabled technology transfer from people to people. In the Livestock Project, farmers that had succeeded in growing feed with water harvesting taught the method to neighboring farmers. Even without support from the team, a women’s group provided instruction in bread-making in response to requests from another women’s group. In this way, the circle of shared experiences of small successes slowly expanded.

In the case of farmer-to-farmer training, the instruction is provided by actual practitioners so it is not only practical, but there are no obstacles in terms of language or culture. Further, it should be noted that farmer-to-farmer training results in significant psychological growth for the trainer as well as the trainee. This clearly demonstrated the importance of empowerment based on pride

and a sense of solidarity. It is difficult to forget the expressions of joy and pride on the faces of the women's group members—most of whom are illiterate—when they were thanked for teaching the other women's groups how to bake bread. This kind of experience improves the group's daily performance from that point forward.

At the same time, many pilot projects suffer from a lack of leadership and unexpected changes in leaders. Almost all of the members were illiterate and lack business experience, and it was difficult to find anyone with the aptitude and experience needed to lead the group within the community, in which very few have any understanding of English. As is typical of any human society, occasionally the groups would experience a falling out and would cease to function.

Development projects led by residents in the target area were further complicated by the duality within the South African economy. Rural areas in the ex-homeland suffering from low productivity and poverty exist side by side with modern cities which constantly look for skilled workers. For the kind of person that has the experience and personality that would make them skilled leaders of a residents' group, it would likely find job opportunities in the urban sector at some point. With the loss of their leader, the group quickly loses its cohesiveness. Leadership is at the core of rural development problems.

We are unable to find a solution that would resolve this problem, but one possibility would be to actively utilize these rural leaders as instructors for farmer-to-farmer training. For example, LDA could sign an annual contract and these leaders could gradually replace LDA extension officers, which are said to include some poor performers. The key is to somehow halt the outflow of people with leadership skills from the target area.

(5) Political and Administrative Dimension

Finally, we must address comprehensive rural development in terms of government and administration. Development based on groups formed within the community should be central to forming resident organizations, at least for the target area. Of course, this is not a generalized view for all communities in South Africa's ex-homelands. After all, there are many other communities in other ex-homelands with the ability to carry out development projects at a higher level than these communities.

The devolution currently underway throughout RSA is an extremely important political issue, and there is no one that would throw doubt on its significance in a historical context. However, while it is true that the first foundation for devolution policies must be the existence of

communities with the ability to govern themselves, unfortunately this foundation is weak in the target area. As a result, conscious efforts to strengthen this base are essential.

Another issue is the government's double-layered structure, consisting of the democratically elected local government organization and the traditional chief system. In 2003, it was the traditional chiefs that held more power in the target area than the democratically elected leaders. This has been rapidly changing, and now the power of the local governments is quite notable. Chapter 6 discussed the results of a related study, but unfortunately an exhaustive discussion of the problems of this double-layered government is beyond the scope of this study. However, it should be noted that some of the traditional chiefs are very knowledgeable about local development needs due to their daily contact with residents. Of course we cannot make a categorical assertion about this, and neither is it merely an issue of a conflict between a new system and the old. The only solution is to devise development ways that will be well received by the residents and that are suited to the political realities that differ in subtle ways between communities.

As described above, the inadequate organizational capacity of LDA time to time caused shortcomings in the course of implementing PRIDE. In the Practical Training Project, several practical farmers cooperated as mentors, but angered by the disappointing response of LDA, they refused their cooperation. Various benefits were considered to show appreciation for their cooperation, but not only were none of these actually offered, but there was no follow-up to the activities. Even in the Small Farming Project and the Livestock Project, the extension officers' activities were not very satisfactory. In the Conservation Project, the completion date was postponed significantly because of problems with contract procedures within LDA.

As with all projects, management of the pilot projects involved patient work, moving the activities forward while resolving the daily problems one by one. LDA's challenge in this regard is still critical, including the sense of ownership in the project, efficient project management and accurate evaluations of officers' performance.

In closing, we would like to point out an important problem that the Limpopo province government should discuss thoroughly. Department of Health and Social Development as well as LDA should immediately stop giving materials and money to some residents' groups without long-term consideration. This leads to a strong sense of inequality between the groups that receive aid and those that do not, and has also led to the breakup of some groups because members of groups that have persevered in their small-scale but high-quality activities begin to

want more as soon as they receive the aid, which leads to internal bickering, and the members begin to distrust one another. Why can't development aid be used more systematically and in a way that will encourage farmers' autonomy? Investment plans should be altered so that they provide matching funds, rather than entire grant funds, and require residents' groups to take considerable responsibility, increasing aid amounts in stages.

Group activities should also be evaluated and monitored. For materialization of real development on the ground, efforts should be made to consolidate thoughts on the development of internal government organizations dealing with rural development, improve employees' basic skills and prevent future corruption.

9.2.3 Implication of this Master Plan to ASGISA

The team believes that the development strategy mentioned above and project idea of CEP described in the following chapter share the same philosophy with ASGISA which is the current overall development framework of the government of RSA. ASGISA is a national policy of economic development of RSA, and it does not further indicate how it can be realized in different situations of different provinces. For example, business outsourcing such as call centers listed as one possible priority area of ASGISA does not mean it should be applied in semi-arid poor rural areas such as Sekhukhune district. ASGISA is literally a national framework, and practical application of the framework according to different situations in the country should be identified by relevant local government agencies.

The development strategy for smallholders in semi-arid ex-homeland areas shown in this master plan has following features, which are within the framework of ASGISA.

- This master plan shows a basic concept of method to bottom up the smallholders, or the "second economy," to the economic mainstream of the country, not a welfare programm. Further it recommends strengthening of competitiveness of the "second economy" by maximum use of local resources, development of nitch markets and alternation of export goods;
- It emphasizes strengthening of human resource development of farmers and extension officers at Tompi Seleka Agricultural Training Center;
- It also recommends a new method of capacity development of government institution, LDA, by incorporation of "farmer to farmer" extension approach.

The target area has many difficult limitations including low rain fall, low fertility of soil, less experienced people, and others. These are critical given conditions when an appropriate

development strategy is sought. It should be clearly understood that practical development strategy should be different according to where and whom it would be applied, and no single development strategy can be a panacea for everywhere and everyone in the country. Without this understanding, there is a considerable risk that the government of RSA repeats the same error that it experienced in the past.

Table 9-1 summarizes the relevancy of the basic strategic concept for smallholder development discussed in this report and the framework of ASGISA.

Table 9-1 ASGISA and Smallholder development

ASGISA in Agriculture	For Smallholder Development
Economic infrastructure, Broad Based AgriBEE, and Food Security	Materials necessary for small scale farming system, range land protection, community soil conservation, rehabilitation of vegetation.
Sector investment, Labor absorbing and Value chain	Promotion of low-cost labor intensive simple farming technologies, differentiation of produce and “Brand agriculture,” appropriate micro-credit.
Human resource development, Research, Extension and Training	Formal training at Tompi Seleka, combined with grass roots training at advance farmers’ fields.
Mainstreaming of the “Second Economy”	Substitution of existing local market dominated by commodities coming from the “First economy”
Capacity building of the government institutions and partnership	Mentor farmer partnership and “Farmer to farmer” extension.

Small holders in semi-arid areas are a difficult target as well as an important target of ASGISA for the shared economic development of the country. They are the one who suffered most in the “Second Economy,” or even lower level, and most importantly, bottom up of these people is indispensable for rural development in the target area and consequently necessary for the shared and sustainable economic growth of the country. Difficulty stems from the fact that the majority of people in the target areas not yet ready to participate in the “First Economy” due to shortage of experience in production and marketing. They have to start from the beginning, otherwise, they will be overwhelmed by advanced technologies and complicated management requirements. Basic development strategy discussed in this report cannot guarantee the success in this difficult task, however, the Team is rather confident that the experience of PRIDE has important implication to the future policy formulation of LDA.

Chapter10 Centers of Excellence Project

10.1 Background

In 2003, responding to the request of the Government of South Africa, the team commenced eight different pilot projects in Sekhukhune district, Limpopo Province. This group of pilot projects is named as PRIDE (Participatory Rural Integrated Development), and PRIDE has aimed to identify appropriate and affordable means of agricultural and other types of income generation for poor black people in rural communities. PRIDE tried to stress the importance of a technical integration and participatory approach. The PRIDE has explored various possibilities of applying successful technical models. One example is an integrated farming system developed in Eastern Asian countries for a long historical time. The team expected that principle of this integration of multiple agricultural production system might be applicable to local communities in the target area, and experimented a vegetable-poultry integrated farming system to improve productivity of the semi-arid land. As of February 2007, the team has observed satisfactory results from the pilot projects. After witnessing the emergence of tangible results and recognizing further developmental potential created by PRIDE, LDA proposed a new project called “Centers of Excellence Project (CEP).”

CEP is composed of two phases, two and half years for Phase 1 and five years for Phase 2. In the most recent development, LDA Sekhukhune district office has begun “PRIDE 2,” which is more or less equivalent to Phase 1 of CEP, and they are still in strong need of external expert support in the subjects of project management and small-scale farming technologies.

10.2 Project Purposes

The poor farmers and other rural residents in nodal points of Limpopo Province would substantially benefit with supplemental incomes generated from sustainable integrated farming and other production models which CEP is to disseminate. They would also benefit from improved environmental conditions in and around their communities as CEP is to introduce rangeland management and promote community forests. These economic and environmental goals would be achieved in tandem with socio-psychological progress in terms of enhancing the sense of ownership and getting rid of dependency mind set among the target population. Followings are the direct project purpose of CEP.

（1） Realization of sustainable livelihood improvement through development and dissemination of models for farming, livestock production and other income generating activities applicable to socio-economic as well as natural conditions of designated nodal points within the province.

（2） Improvement of environmental status of communal lands by introducing the participatory management of rangeland to prevent over-grazing and by promoting community initiative to set out community forests and to address the issue of soil erosion.

（3） Consolidation of participatory approach in rural development with tangible and sustainable results of project activities and improvement of people's sense of ownership and self-reliance.

（4） Establishment of institutional mechanisms of delivering knowledge and experience to rural residents.

（5） Awareness raising among extension officers on the main concept of small-scale farmer development underlying CEP that smallholder development should be based on promotion of low cost integrated farming system and human development of rural farmers.

（6） Dissemination of project experience to other districts within the province and even to other provinces.

10.3 Framework of CEP

10.3.1 Target Communities

Target areas of CEP include at least five municipalities listed below, however, it does not restrict further application of CEP in other semi-arid poverty areas of the province.

- Fetakgomo municipality in Sekhukhune district.
- Makhuduthamaga municipality in Sekhukhune district.
- Marble Hall municipality in Sekhukhune district.
- Blouberg municipality in Capricorn district
- Maruleng municipality in Bohlabela district

10.3.2 Phasing of the Project

Phase 1: From April 1, 2007 till September 30, 2009,

CEP would cover the three municipalities of Fetakgomo, Makhuduthamaga and Marble Hall in Sekhukhune district. The goal of Phase 1 is twofold; the first is to ensure a gradual but steady

expansion in project activities in these municipalities in order to further prove the usefulness and practicality of the CEP activities. Broad application of farming technologies developed by PRIDE in LADEP project is another expectation during the phase 1. The second is to prepare a project feasibility report needed for the implementation of Phase 2, for which donor's financial and technical support would be instrumental to mainstream CEP activities in a volume multiplied, at least, several times that of Phase 1. Implementation period of Phase 1 is from April 2007 till September 2009.

Phase 2: From October 1, 2009 till September 30, 2014,

During Phase 2, CEP would not only substantially elevate its scale of operations in the three municipalities in Sekhukhune district, but proceed to include at least two new municipalities: namely, Blouberg municipality of Capricorn district, Maruleng municipality of Bohlabela district. One more municipality may be identified to make the total target municipality six. Through the proposed five year period of Phase 2, CEP is expected to develop itself into ubiquitous, as against pioneer in Phase 1, practices of rural development in Limpopo province. Furthermore, necessary arrangements would also be made to facilitate a gradual spill-over of CEP activities to other municipalities of Limpopo province and even outside the province. Implementation period of Phase 2 is from October 2009 till September 2014.

10.3.3 Small agriculture component

A small-scale, about 0.3 ha plot of land, but labor-intensive and profitable faming model has been developed by PRIDE. The most critical thrust of the model is the integration effects among different farm activities such as poultry, fish culture, earthworm culture, vegetable production and homestead tree planting. The combination of these farm activities is an essential element of Asian farm modes, which enable farmers to reduce production costs and to enhance farm's resilience against drought and diseases. Another important aspect of the Small Agriculture component is water-harvesting and water-saving which are very critical in the targeted municipalities. Overall, this component would aim to benefit ordinary residents in the target municipalities who do not have access either to a sizeable land or large-scale irrigation facilities.

During Phase 1, the farming model developed by 0.1ha Integrated Farming Project of PRIDE would be further tested and tuned to secure its technical appropriateness and economic viability in small farm context in the three municipalities in Sekhukhune district. At the same time, CEP would help more farmers practice the model in their backyards or community gardens. Minimum of additional 600 farmers are expected to participate in this activity, and 200 of them or more would actually realized profit in Phase 1. The following is planned activities under the

Small Agriculture component during Phase 1.

Training of Farmers

Thirty sessions of 5-day training course would be conducted at Tompi Seleka Agricultural Training Center. Similar training has already been successfully conducted as a part of PRIDE 2 activities in November 2006. This training is open to both current farmers and would-be farmers. The training would first provide lectures for basic understanding on small-scale integrated farming and followed by farm visits. Since each course could accommodate about 20 people, 600 people would be trained in total during Phase 1. Cost of this training is estimated to be SAR 300,000 and possibly covered by budget of Tompi Seleka Agricultural Training Center.

On-farm After-Training Support

After the above course training, on-farm support would be provided by Sekhukhune district office to the trained farmers to ensure farmers' proper introduction of the trained techniques. It is expected that at least 30 % of trainees would eventually put the learnt techniques into practice at their farms, and thus 200 people would be given the on-farm after-training support service. These 200 people would also be assisted to cover a certain portion of the initial costs of constructing chicken sheds, purchasing the chicks of appropriate breed and obtaining any other materials needed to start off the trained practice. In this way, each and every 200 people would be financially supported with the limit of SAR1,000 per person. Cost for this activity is estimated to be SAR 200,000 and should be covered by CASP budget.

Training for Officials

In addition to direct support to farmers and would-be farmers as discussed above, CEP would hold introductory and intermediate training courses for LDA extension officers, NGO personnel and municipality officials from not only within the target areas but from other areas of the province. The 5-day introductory courses would train 100 persons, while 15-day intermediate courses would benefit 20 persons, giving advanced training to the successful attendants of the introductory course. Estimated cost of this training is SAR 140,000 and should be covered by capital budget of the Head Office.

Miscellaneous Service

CEP would also support these initiating farmers regarding associated activities that individual farmers feel difficult to undertake by themselves; examples include vaccination and other disease prevention service for chickens and the delivery of low-cost inputs like orange residues from a juice factory in Polokwane. These services would be regularly rendered throughout the

project period by Sekhukhune district office. The costs of providing these services would be around SAR 150,000 per year, and thus SAR 400,000 for the entire Phase 1.

10.3.4 Livestock production component

The Livestock Production component is intended to strengthen small-scale livestock production capacities of local residents, like the Small Agriculture component, basically by proving training and following up after-training support. The technical focus would be on the improvement of traditional practices concerning free range chicken, goat and other small animals. One of important activities under this component would be the low cost feeding of small livestock with fodder crops and silage production, techniques of which are so far unknown among the local farmers. In addition, this component would pay attention to social aspects as well. For instance, in order to solve the problem of severe overgrazing in communal lands, it would introduce rangeland management by combining the effects of physical fencing and of social fencing so that collective sense of management would be fostered in communities.

Based on a technical package formulated by PRIDE, Phase 1 would aim to disseminate the improved technology to the larger number of farmers in the three target municipalities. The expected number of additional beneficiaries would be in the range of 600 or more. The following is planned activities under the Livestock Production component during Phase 1.

Training for Farmers

Thirty sessions of 4-day training would be conducted at Tompi Seleka Agricultural Training Center to provide both current farmers and would-be farmers, who would be at first organized into livestock farmer groups. Basic knowledge and know-how needed for raising livestock productivity would be taught and subsequently at the farms of pioneer farmers. Each course could accommodate about 20 people, and 600 people in total would be trained in total during the two year period of Phase 1.SAR 300,000 would be necessary for this training and possibly covered by budget of Tompi Seleka Agricultural Training Center.

On-farm After-Training Support

After the training above, on-site support service would be provided to the trainees by Sekhukhune district office of LDA so that farms would be able to apply the trained techniques properly. It is expected that at least 50 % of trainees would eventually put the learnt subject into practice at their farms; in other word, 300 people would receive the on-farm after-training support service. They would also be provided with basic material and inputs needed to start educated practices within the limit of SAR1,000 per person. Estimated cost for this activity is

SAR 300,000 and should be covered by CASP budget.

Grazing Land Fencing

One of the most important activities of this component is fencing of designated communal land. This fencing would enable to prevent over-grazing and an adequate amount of grass would be conserved as preparation for winter drought. CEP would invite communities to come into agreement with LDA for the protection of rangeland. A thorough understanding and cooperation among community members would be a precondition for this activity since physical fencing alone hardly make any effect when facing the lack of cooperation among community members. The average size of protected rangelands would be approximately 3ha, and necessary cost would be SAR 360,000 and should be covered by CASP budget.

Training for Officials

Parallel to the direct support to farmers as discussed above, CEP would also hold introductory and intermediate training courses for extension officers of LDA, NGO personnel and municipality officials from not only within the target areas but from other areas of the province. The courses would benefit 120 persons of which 100 persons would participate in 5-days introductory courses, while 20 persons in 15-day intermediate courses. Estimated cost for this training is SAR 140,000 and should be covered by capital budget of the Head Office.

Miscellaneous Service

CEP would support the participating farmers for delivering particular activities, which the farmers feel difficult to be done only by themselves. Examples include vaccination and other disease prevention service for chickens and the intermediation in case a conflict takes place over how to use communal lands for grazing. These services would be regularly rendered by LDA Sekhukhune office. The costs of providing these services would be around SAR 150,000 per year, and thus SAR 300,000 for the entire Phase 1.

10.3.5 Community woodland conservation component

Most of communal lands in Sekhukhune district are environmentally in very poor conditions; they are usually barren and occasionally eroded severely, resulting in the development of a lot of dongs. This Community Woodland Conservation component is aimed to provide an environment jerk in communal lands by rehabilitating woodlands (or community forests) under community initiative; fencing and reinforcement planting of useful native trees such as marula tree, are basic means to set up community forests. Besides environmental well-being including flood prevention and ground water rising, local people would also be able to gain, in the future,

economic benefits in the forms of fuel wood, grass, fodder and small wild animals that community forests would harness. The active participation of community members would be sought after when constructing community forests and introducing biological means coping with soil erosion and degradation. In Radingwana, Fetakgomo municipality of Sekhukhune district, PRIDE has initiated a small community forest of 2 ha, which could be used as a demonstration site for dissemination of the concept in Phase 1. The following is planned activities under the Community Woodland Conservation component during Phase 1.

Community Nursery

In addition to the village nurseries built under PRIDE, four more nurseries would be launched at as early a timing as possible to supply seedlings for reinforcement planting in community forests of neighboring communities. A group of 10 to 15 villagers would be responsible for managing each of these nurseries and should be financially self-standing in the long run, but some financial and technical support would be inevitable during Phase 1. Each nursery would become capable of producing 10,000 seedlings annually, and if they are sold at SAR 8 per seedling, it possibly generates handsome SAR50,000 every year. This profit can doubles the income of nursery project members. Estimated cost of this activity is SAR 500,000 and should be covered by CASP budget.

Community Forests

CEP would invite any communities of the three municipalities to come into agreement with LDA for creating 20 new community forests of about 3 ha each within their communal premise. CEP would provide about 2,000 seedlings, other construction material, and earthwork services needed for community forests while communities are required to provide free labor during the earthwork and plantation. The communities would be also obliged to provide due vigilance over the forests set out in coming years on the condition that all the benefits generating in due time would belong to a group of villages protecting them, with or without profit sharing with their communities. This activity is estimated to cost SAR 900,000 and possibly covered by CASP budget.

10.3.6 Other Activities

In close association with the three components discussed above, supplemental project activities would be carried out to enhance local people's capacity to cash in economic opportunities opened by CEP. The following is planned activities under this component during Phase 1.

Micro-Credit

The opportunity for local people to receive micro-credit should be secured so that they would be able to undertake agricultural and livestock activities that CEP is to promote. The modality of micro-credit would be as follows. At first, participating NGOs of a reputable truck record would be identified. They would help the farmers who successfully completed CEP training program organize themselves into borrower's solidarity groups. Subsequently, provided that the solidarity group concurs a loan to a farmer, the NGOs would lend small loans to him/her and would gradually raise credit line according to the performance of individual borrowers and solidarity groups. The participating NGOs in turn would be provided with seed fund by CEP. For Phase 1, the micro-credit activity would remain experimental, with the budget of only SAR 100,000 per year. In Phase 2, however, full-fledged micro-credit activities would begin by making the best use of lessons drawn from phase 1 pilot activity. Estimated cost necessary for Phase 1 of this activity is SAR 200,000. MAFISA budget should be used for this component, and corroboration with NGOs, which already has substantial experience in rural micro-finance activities should be thoroughly sought.

Women's Group and Youth Group

Another potential area requiring CEP intervention would lie in nurturing women's groups and youth groups. They are increasingly active in looking for new economic activities to improve their income capacity. On a group by group basis, CEP would scrutinize the purpose and leadership capacity of groups and render support to their activities whatever deems reasonable from business point of views. This activity would be undertaken within the budgetary limit of SAR 50,000 pre year, and SAR 200,000 in total in Phase 1 will be necessary.

Feasibility Study of Phase 2

Last but not least, during Phase 1, the Project Implementation Unit of CEP would have to complete a feasibility study regarding Phase 2 and produce a project document quality of which meets the international standards to secure larger development funds and necessary expertise to implement Phase 2 in full scale. The feasibility report should be prepared expecting that possible funding source of Phase 2 would be international development banks and that necessary technical assistance would be provided by grant basis from a bi-lateral donor agency. Implementation of the feasibility study itself may also be supported by a donor agency, and estimated cost for the feasibility study is SAR 500,000.

10.3.7 Project Implementation Unit for Phase 1

CEP Project Implementation Unit would be established with members of following.

Project Director

Head of the Department of LDA or any other senior official nominated by MEC Agriculture, would assume overall responsibility of executing CEP as the Project Director. Personnel expense for this position would be covered by the recurrent budget of LDA.

Project Manager

Although LDA would be able to assign the senior manager of Sekhukhune district office as the Project Manager, it is more recommendable to select a senior officer who would perform exclusively for the management of CEP without any competing assignment and be accountable to the Project Director. Personnel expense for this position would be covered by the recurrent budget of LDA.

Assistant Project Manager

A local or international consultant of project management competence would be assigned to help the Project Manager steer the Project on day-to-day basis. He/she must have sufficient knowledge of local society as well as the technicality of project activities. Estimated cost for personnel expense of this position is SAR 360,000, and would be covered by LDA's capital budget.

Project Operators (LDA Staff)

At least 3 officials of LDA should be assigned exclusively for CEP on a full-time basis. Each of them would be responsible for project operations in each of the three municipalities. Personnel expense of this position would be covered by recurrent budget of LDA

Project Operators (Non LDA Staff)

A group of young local consultants would be recruited to carry out project operations on the ground. They would be assigned each municipality as the area of responsibility and make everyday operation under the supervision of the Project Manager. They must have sufficient command of local language. Three Project Operators would be secured during Phase 1, but their number would have to be increased to more than 10, taking into consideration a considerably enlarged size of operations in Phase 2. Estimated personnel expense for this position is SAR 720,000 and would be covered by capital budget of LDA.

Technical Advisors

International or local senior consultants would be mobilized time to time under the limit of 150 person-days per year in accordance with the needs of technical and managerial assistance to the

Project Manager and the project as a whole. Estimated cost for three Technical Advisors is SAR 600,000 and international donor's grant support is highly appreciated. Otherwise, this cost would be covered by capital budget of LDA.

10.3.8 Work Break Down Structure (WBS)

Work Break Down Structure of CEP Phase 1 is attached as a reference to Annex of this report.

10.3.9 Phase 2: Indicative Magnitude of Activities

The CEP project components would be thoroughly reviewed in the second year of Phase1. The results of the review would be fed back to the feasibility study of Phase 2 which would be taking place during Phase 1. It is absolutely necessary that a feasibility study for Phase 2 should come up with a quality report acceptable to international donors and financing institutions. At this moment, premature guesswork is not of much help to work out accurate project descriptions for Phase 2. Therefore, we stop here and now only indicate some important pieces of perception to share the sense of anticipated magnitude and coverage of Phase 2.

Target area

With the start of Phase 2, at least two new municipalities would be added as the target municipalities. This means CEP's geographical coverage would become more than double that of Phase 1, taking into account the much larger geographical areas of the joining municipalities.

Beneficiaries

In terms of the number of direct beneficiaries in each municipality, there would also be a significant increase from the range of 300 - 400 persons in Phase 1 to the range of 1,000 – 1,500 persons in Phase 2.

Project sites

The total number of fenced grazing lands and community forests would be increased from 30 -40 sites during Phase 1 to the magnitude of 400 -600 sites.

Project Implementation Unit

While the project would be implemented in other districts than Sekhukhune district in Phase 2, at least two more Project Implementation Unit would be set up to steer project activities of Phase 2.

10.4 Indicative Cost of CEP

Phase 1 of CEP requires SAR 3 million per year and it sum up to SAR 7.5 million for 2.5 years of Phase 1. Break down of the estimation is shown in the Table 10-1. Phase 2 is designed to make a visible and tangible impact on the lives of poor farmers in nodal points, and would require a considerably larger funding than Phase 1. The figure of SAR 75 million would be required for Phase 2, based on the calculation that SAR 15 million of costing for each year is multiplied by 5 project years of Phase 2. This in the meantime remains indicative only and should be estimated thoroughly through the feasibility study.

Table 10-1 Cost table of Phase 1 of CEP

Component	Duration	Quantity	Unit Cost (SAR)	Budget (SAR)
Small Agriculture Component				
Farmer Training	5days	600 persons	500 per person	300,000
On-site After Training Support		200 persons	2,000 per person	400,000
Introductory Course for officials	5 days	100 persons	1,000 per person	100,000
Intermediate Course for officials	15 days	20 persons	2,000 per person	40,000
Miscellaneous Service	2 years		15,000 per year	300,000
			Sub-total	1,140,000
Livestock Production				
Farmer Training	4 days	600 persons	500 per person	300,000
On-site After Training Support		300 persons	1,500 per person	450,000
Grazing Land Fencing	12 sites		30,000 per site	360,000
Introductory Course for officials	5 days	100 persons	1,000 per person	100,000
Intermediate Course for officials	15 days	20 persons	2,000 per person	40,000
Miscellaneous Service	2 years		15,000 per year	300,000
			Sub-total	1,550,000
Community Conservation				
Community Nurseries	4 sites		20,000 per site	80,000
Community Forests	20 sites	3ha	15,000 per ha	900,000
			Sub-total	980,000
Other Activities				
Micro-Credit	2years		50,000 per year	100,000
Women's and Youth Group	2years		50,000 per year	100,000
Feasibility Study of Phase 2		Donor support is expected for ZAR500000		
			Sub-total	200,000
Project Implementation Unit				
Project Director	1 person	LDA financing out of the regular budget		
Project Manager	1 person	LDA financing out of the regular budget		
Assistant Project Manager	1 person		15,000 per month	360,000
Project Operator (LDA Staff)	3 persons	LDA financing out of the regular budget		
Project Operator (Non-LDA Staff)	3 persons		10,000 per month	720,000
Technical Advisors	150 days		,2000 per day	600,000
			Sub-total	1,680,000
			Contingency	450,000
			Grand Total	6,000,000

Chapter11 Master Plan for Soil Conservation in Sekhukhune District

11.1 Development Issues

(1) Establishment of the basic framework for community-based soil conservation activities

The natural environment in the target area is characterized by scanty rainfall, degradation of vegetation and low water-retention ability of the soil. As rainwater cannot be absorbed and stored, it can cause high runoffs even in the case of small amounts of precipitation, making the area susceptible to considerable soil runoffs. Initiatives aimed at soil conservation in the target area need to stimulate the participation of local communities whenever possible, and to increase their awareness of land degradation problems, ensuring at the same time that communities benefit from the soil conservation activities they participate in. A basic framework for community-based soil conservation activities needs to be established. Most of the previous LDA's soil conservation projects using the participatory approach failed to build sustainable maintenance mechanisms. The following aspects need to be taken into consideration as part of the basic framework for the promotion of community-based soil conservation activities.

Selection of target sites

After target communities for the soil conservation project was selected, target community members will have to decide first which areas of the community's lands will become the focus of soil conservation activities.

In an environment marked by severe land degradation, where a large amount of soil is washed away even by small amounts of precipitation, it is difficult to control the aggravation of large-scale erosion (donga) by artificial means. Results of the previous soil conservation projects have shown that, when targeted areas have large-scale deep dongas, or steep inclines, structures need to be larger, calling for the input of huge amounts of cost and time. Therefore, target areas of an adequate size and an adequate inclination, eroded by relatively small, shallow dongas, must be selected in order to reduce the input of cost and time, and to achieve a satisfactory effect through small-scale, simple structures.

Design

From planning, implementation to maintenance, communities must be the actors carrying out the activities. Therefore, it is necessary to design simple structures, which can be easily constructed and

maintained by communities.

Input scale

The adequate use of internal and external resources is an important factor in determining the appropriate scale of input. In the pilot project of this study, procurement of machines by LDA from the private sector triggered significant increases in the project cost. Careful consideration must be given to input-related issues, such as whether LDA should possess its own machines.

Establishment of a maintenance system

In many of the previous soil conservation projects, the maintenance of constructed structures either lacked continuity, or were inadequately carried out. The factors responsible for this situation include LDA's staff shortage, a deficient extension system, the lack of community ownership, and unsustainable communication between LDA and the communities. LDA Head Office personnel, district office personnel, and extension officers should endeavor together with the communities to develop a sense of ownership towards the project, and establish a sustainable and adequate management system.

(2) The need for LDA-led wide-area initiatives from a long-term perspective – aiming to control soil runoffs in the target areas, and to improve facilities damaged through soil runoffs -

Both soil erosion and soil runoffs occur widely in the target area. Eroded soil runs off and is carried to downstream areas, where it causes the following types of damage.

1) Facilities in downstream areas are collapsed, as well as land erosion is expanded due to the high flow rate and flow volume of soil runoffs during floods.
2) Larger dams like the Lepellane Dam and numerous small-scale dams constructed in the area for cattle watering become filled with sediments, and consequently become unable to function as dams.

Given the huge scale of damages caused by soil runoffs, there is a limit to the measures that can be taken by a community-based approach. This makes LDA-led wide-area initiatives, formulated from a long-term perspective necessary. Nevertheless, projects should not be carried out by LDA alone, and should involve members of communities who have strong relationships to the area whenever possible. These two approaches, community-based and LDA-led, should be given equal importance, and should be carried out simultaneously.

(3) Extension of past experience

There are few opportunities that information concerning the previous projects and pilot projects including their achievements and lessons learned can be shared by the LDA staff and community members. To secure the success of soil conservation initiatives in the target area, lessons from one project or a community need to be shared with other projects or communities. For this reason, it is important to enhance information and communication function of LDA, as well as mutual information exchange among the communities.

(4) Human resources and organizational development

The pilot project demonstrated, to a certain extent, the effectiveness of the participatory approach. However, current number of staff members in LDA Head Office and Sekhukhune district office is far less than enough to establish a sustainable system to provide support to communities in the planning, implementation, and maintenance phases. Activities are needed to build the capacity of LDA staff and communities, to consolidate organizational structures, and to improve the extension system.

(5) Raising environmental awareness

From the residents' viewpoint, earning a livelihood is more important than environmental problems. With environment protection and soil conservation activities requiring time and effort, it is difficult to create incentives for the residents. For this reason, information sharing between communities participating in community-based soil conservation activities and environment protection activities, as well as greening activities such as school forest programmes, should be fostered as opportunities for residents to discuss and deepen their understanding on the long-term benefits of environment protection.

11.2 Basic Policies in Formulating the Master Plan

(1) Promoting a participatory approach in community-based activities

The following activity guidelines have been formulated in order to secure proactive local participation in soil conservation efforts.

Activity phase	Content of activities based on a participatory approach		Activity output
	LDA's role	Residents' role	
Planning phase	Facilitation of residents' activities using the participatory method	Planning of soil conservation facilities using the participatory method	Target-area resource map; Soil conservation map
Implementation phase	Supervision of construction, forestation, and planting works carried out by constructors and residents	Civil construction work; Fence construction work; Forestation and planting work	Waterways, storm water banks, contours, and other civil engineering structures; Fences; Forestation and planting
Maintenance phase	Providing support to residents' maintenance work	Formulation of the maintenance plan; Maintenance activities	Maintenance plan; Maintenance record

In order to avoid choosing a target site characterized by extremely severe conditions, which entails high expenses, the following set of moderate conditions have been established as selection criteria.

Area surface	100 ha - 500 ha
Inclination	No more than 5%
Surface of watershed area	Usually 2 km^2 - 3km^2 Up to 10 km^2 for gentle slopes with an inclination of about 2% or less
Soil erosion and donga distribution	No large-scale, deep dongas, only small-scale, shallow dongas (depth: 30 cm - 50 cm or less, width: less than 20 m)

(2) Combining LDA-led activities with resident-led activities

It is impossible to solve all soil erosion problems by a community-based approach. When scale of soil erosion is extremely large and eroded areas are not suitable for cultivation or pastures, the benefits of soil conservation for the community are not clearly visible, and implement soil conservation by community-based approach becomes difficult. In such cases, it is necessary to conduct soil conservation projects as public works. LDA-led soil conservation projects should be carried out along the following lines.

Control of wide-area soil runoffs through forestation and planting, from a long-term perspective

The control of soil runoffs in heavily eroded areas with large-scale, deep dongas, or in a large area, through the construction of waterways, storm water banks and other civil engineering structures, as well as of protection structures using stone materials and tires, presents the following problems:

1) Huge costs and long time are necessary to complete the construction of such large-scale structures.

2) Floods occurring frequently during the construction may cause damage to the structures under construction, and aggravate erosion. Additional cost and time will be needed to repair damaged structures, making the control of erosion expansion difficult.
3) The large scale of the structures renders maintenance problematic. Damage to the structures entails not only increased repair costs, but also higher maintenance costs.

For these reasons, erosion problems should be addressed not by building structures, but through methods centered on forestation or planting. Possible activities for these forestation and planting are the same as those of "greening promotion" and "environmental education" activities described in (6).

Improvement of existing dams

The Lepellane Dam and small-scale dams for cattle watering, which have lost their functions due to sedimentation, need to be improved based on the following policies:

Dam types	Basic policies for improvement
The Lepellane Dam	With almost 100% of the 10 million m^3 storage capacity of the dam having been filled with silt, functional restoration by dredging is practically unfeasible. Nevertheless, if left in the current state, the dam will lose its flood-control functions, and even small floods may cause the spillway to overflow, having a devastating impact upon the downstream areas. Dam improvement needs to be undertaken through the following methods: i) Reinforcement of slopes in a downstream side of the dam structure through counterweight fills and planting. ii) Repairing damaged spillways Construction, planting, and other works are implemented with the cooperation of neighboring communities.
Small-scale dams for cattle watering	Given their small scale, sediment in these dams can be removed through dredging. The following methods are used for dam improvement. i) Removal of soil deposits through dredging ii) Upgrading and strengthening of dam structures iii) Repairing and improving spillways Facility repairs and other works are carried out with the cooperation of related communities.

(3) Promoting extension activities

In order to extend community-based soil conservation, it is indispensable to make its importance and benefit widely known in the target area. For this purpose, main strategies are followings, 1) utilize the Mobile Information Unit used in the pilot project, and 2) promote information dissemination using the project site of this study as a demonstration site, for the extension of information.

Activity type	Activity implementation	Activity basic policies
Use of the Mobile Information Unit	Head Office District office	**Implementation methods:** Brochures and video materials containing the following information are created and distributed through the Mobile Information Unit. i) Examples of community soil conservation ii) Examples of successful and unsuccessful soil conservation projects
Use of a demonstration site	Head Office District office	**Target:** Although targeted primarily at local people interested in community soil conservation, community forestry and other environment protection initiatives, these activities also aim to raise the awareness of participants recruited from LDA personnel, land care coordinators and municipal staff and other relevant staff members. **Implementation methods:** i) PR on the demonstration site ii) Study tours to the project sites of the Community Soil Conservation Project and Community Forestry Project within and outside of the target area.

(4) Promotion of capacity building and organizational development

Capacity building at the level of both LDA and local communities is necessary in order to put the master plan into operation. The following 3 activities are conducted in order to extend soil conservation-related activities to a wider area and to establish a sustainable system of support to communities.

Activity type	Activity implementation	Activity basic policies
Organizational development of the Head Office and district offices	Head Office District offices	**Organization forms:** Groups consisting of 1 Head Office staff member, 1 district office staff member and several extension officers are designated as "activity units." Each activity unit is given charge of a number of projects. Form another section which is responsible for the overall control of the groups. **Objective:** 3 to 5 activity units will be organized and will start functioning during the first 4 years of the extension stage.

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Activity type	Activity implementation	Activity basic policies
Training for extension officers	Head Office District office	**Basic strategy for the extension stage:** Training on the soil conservation project is conducted. In addition, workshops are carried out in order to improve the activities of the extension officers. **Basic strategy for the self-sustaining stage:** Extension officers who have attended training and those who have not jointly hold workshops on extension activity evaluation, problem identification, and improvement strategies, seeking to enhance their problem-solving and implementation abilities. Improvement strategies are determined and the necessary steps are taken in order to put them into action.
Training for communities	Head Office District office	**Basic strategy for the extension stage:** Training programs on maintenance are carried out for members of the communities where soil conservation activities have been completed. **Basic strategy for the self-sustaining stage:** Training is targeted at the same groups as in the extension stage. Instructors and community members take part in discussions on the problems encountered during the extension stage and on possible improvement strategies. Later, these improvement strategies are implemented by the community members, which help them enhance their problem-solving and implementation abilities.

(5) Incorporation of greening promotion and environmental education

As indicated in (2) above, the problem of soil erosion needs to be addressed not only through civil engineering methods, but also through the greening component, as well as through long-term efforts such as environmental education targeted at the residents.

Activity type	Activity implementation	Basic policies and procedures of activities
Promotion of school forests and school extracurricular activities	Primary and secondary schools Head Office District office	**Objective:** To foster environmental awareness among primary and secondary school students. **Implementation methods:** i) Carrying out PR activities targeted at primary and secondary schools ii) Based on applications from schools, support is provided to school forests and extracurricular activities (trips to soil conservation project sites, etc.).

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Activity type	Activity implementation	Basic policies and procedures of activities
Designation of greening areas	Head Office District office	**Objective:** To stimulate residents' participation in greening activities and to raise their environmental awareness **Implementation methods:** i) Selection of designated greening areas. ii) Seedling trees are bought from tree nurseries of the Community Forestry Project, of the DWAF, and from the private sector. iii) Seedling trees are distributed to communities, who undertake forestation activities. iv) Local people attend training on seedling management methods.
Control of soil runoffs and erosion aggravation in the vicinity of waterways and dongas	Head Office District office	**Objective:** Areas affected by heavy soil erosion and having a damaging impact on downstream areas due to soil runoffs are designated as target areas. Soil runoffs and erosion aggravation are controlled by planting vetiver grass and other herbaceous plants. **Implementation methods:** i) Selection of target areas ii) Procurement of vetiver grass seedlings, herbaceous plant seeds and fertilizers. iii) With the cooperation of related communities, vetiver grass is planted/sown around target waterways and dongas.
Promotion of community forestry	Communities Head Office District office	The same activities are carried out as in the "community forestation project" in this study.

11.3 Framework of the Master Plan

(1) Activity components

Based on the above consideration about the development issues and the basic strategies, the activity components that should be included in the soil conservation master plan can be summarized as given in Table 11-1.

Table 11-1 Activity components

Activity field \ Activity type		Soil conservation/Facility improvement	Greening promotion/Environmental education
Main activities	LDA-led	Facility improvement • Improvement of the Lepellane dam • Improvement program for small-scale dams	Greening activities • Designation of greening areas • Control of soil runoffs and erosion aggravation in the vicinity of waterways and dongas • Promotion of community forestation Environmental education activities • School forests • Promotion of school extracurricular activities
	Community-based	Soil conservation activities • Community soil conservation	
Support activities		Capacity building and organization development • Organizational development of the Head Office and district offices • Training of extension officers • Training of community members Extension activities • Utilization of the Mobile Information Units • Use of demonstration sites and field visits	

(2) Area zoning and activity patterns

When implementing the above components, attention must be paid to the geographic specificity in the target area. The purpose of area zoning is to break the target area down into several zones and typify the activities (combining production, soil conservation activities, etc.) for each zone. Activity patterns for each zone and geographic divisions in the target area are indicated below.

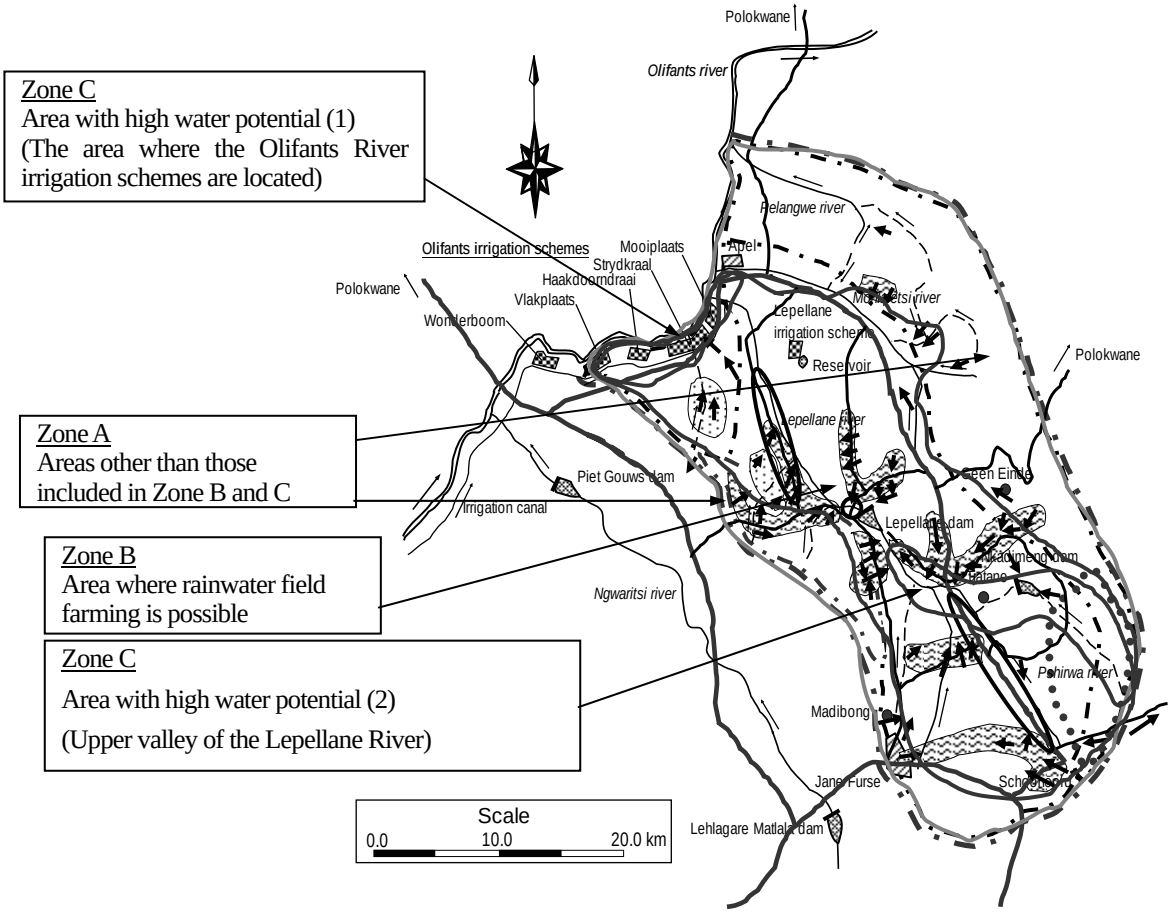
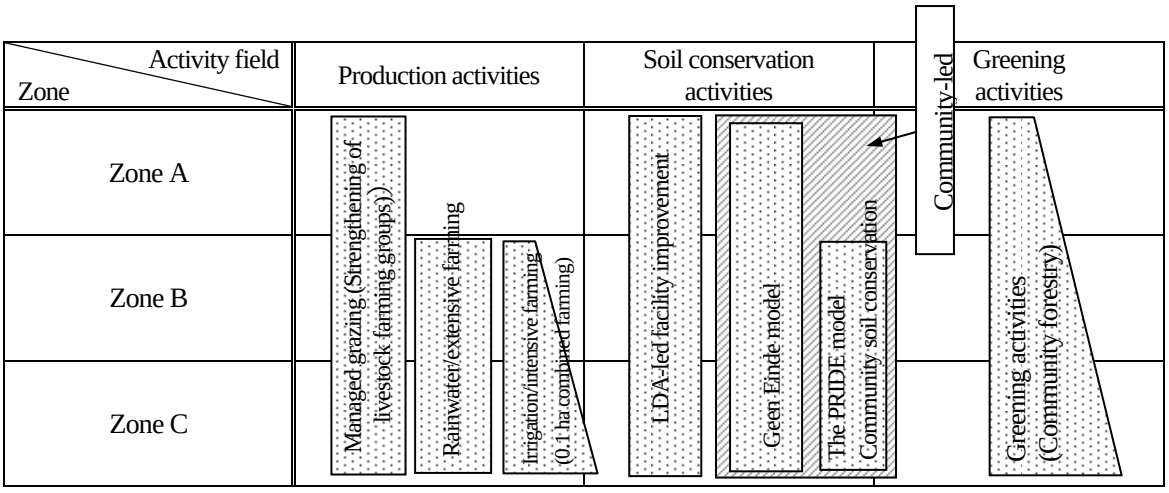


Figure 11-1 Area zoning

Table 11-2 Activity types for each zone



Note: ( ) show the pilot project corresponding to each activity in this study.

The following points should be kept in mind with regard to the area zoning and activity patterns indicated above.

1) There are some areas in Zone B where rain-fed/extensive farming is not practicable, and there are some areas in Zone C where irrigation/intensive farming is not practicable. The features of soil, topography and others of each zone are not uniform within the zone, and the zones contain areas with unfavorable conditions. Zones A, B, and C are rough divisions.
2) While in Zone C the possibility of practicing irrigation/intensive farming is high, in Zone B the possibility is low. Nevertheless, in some areas of Zone B irrigation/intensive farming is being practiced. Irrigation/intensive agriculture can be promoted as a recommendable activity in Zones B and C.
3) Grazing is practiced in all the 3 zones.
4) Although some of the Olifants River irrigation schemes located in Zone C do not function, the area was included in Zone C due to its high water potential.

(3) Activity time frame

Activities included in the master plan are implemented according to a time frame consisting of a pilot stage, an extension stage, and an autonomous stage.

Stage	Activity objective
Pilot stage (2004-2006)	Model establishment (design, process, implementation, and maintenance systems)
Extension stage (2007- 2012)	Extension to a large number of communities
Self-sustaining stage (2013-2017)	Improvement of problem-solving and implementation ability in target communities

(4) Logical framework of activities

The logical framework indicating the structure of the soil conservation master plan in the target area is given in Table 11-3.

Table 11-3 Logical framework of the soil conservation master plan in the Sekhukhune District

Project outline	Indicators
Overall objective A) The impact of soil erosion and environment degradation is reduced. B) The capacity of communities faced with problems of soil erosion and environment degradation is strengthened. C) The capacity of administrative personnel in charge of promoting the activities in the master plan is improved.	A) Situation of soil erosion, flood flow, vegetation, cultivated area, crop yields. B) Changes in awareness, positive attitude, technical knowledge, management capacity. C) Changes in awareness, positive attitude, technical knowledge, management capacity.
Project objective **[Pilot stage]** A model for community-based soil conservation activities is established. **[Extension stage]** All activity types included in the master plan extend to a large number of communities in the PRIDE target area. **[Self-sustaining stage]** Problem-solving and implementation ability of communities participating in activities is improved.	Situation of maintenance; sustainability of the functions of soil conservation structures; sustainability of the maintenance system Number of participating communities and activity outcome Activity outcome

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Project outline	Indicators
Output	
[Pilot stage]	
a) Structures completed through community soil conservation activities; maintenance system within participating communities	Functions of soil conservation structures; functions of the maintenance system
[Extension stage]	
a) Organizational capacity of the Head Office and district offices are improved	Functions of administration's implementation system
b) Structures are completed through community soil conservation activities. A maintenance system is established in participating communities.	Functions of soil conservation structures; functions of the maintenance system
c) Infrastructures such as the Lepellane Dam and small-scale dams are improved.	Functions of improved facilities
d) Forestation and planting are carried out in selected areas. Elementary and junior high schools take part in environmental education activities.	Situation of forestation and planting management; outcomes of environment education activities
e) Training programs are conducted for extension workers and community members.	Training activity outcomes
f) Extension activities are conducted through the Mobile Information Unit, and demonstration sites.	Extension activity outcomes
[Self-sustaining stage]	
a) Structures are completed through community soil conservation activities. A maintenance system is established in participating communities.	Functions of soil conservation structures; functions of the operation and maintenance system
b) Forestation and planting are carried out in selected areas. Elementary and junior high schools take part in environmental education activities.	Situation of forestation and planting management; outcomes of environment education activities
c) Training programs are conducted for extension officers and community members.	Training activity outcomes
d) Extension activities are conducted through the Mobile Information Unit, and demonstration sites.	Extension activity outcomes

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Activities	Input	Prerequisites
[Pilot stage] a) Implementation of community soil conservation projects at 3 selected sites. **[Extension stage]** a) Securing human resources for Head Office and district offices; formation of activity units. b) Promotion of community soil conservation based on established activity models. c) Planning and implementation of facility improvement for the Lepellane Dam and small-scale dams. d) Designation of greening areas; selection of target areas for control of soil loss; promotion of community forestation; promotion of environmental education activities at primary and secondary schools. e) Planning and implementation of training programs for extension officers and community members. f) Planning and implementation of extension activities using the Mobile Information Unit, and demonstration sites. **[Autonomous stage]** a) Promotion of community soil conservation based on established activity models. b) Designation of greening areas; selection of target areas for control of soil loss; promotion of community forestation; promotion of environmental education activities at primary and secondary schools. c) Planning and implementation of training programs for extension officers and community members. d) Planning and implementation of extension activities using the Mobile Information Unit, and demonstration sites.	Materials: Waste tires, stone materials, vetiver grass, tree seedling, herbaceous plant seeds, fertilizers, etc. Machines: Dozers, graders, etc. Human resources: Local consultants Measurement companies Constructors Community members Extension workers District office personnel Provincial office personnel Funding: Refer to the section on "Implementation budget"	

(5) Technical model

The following technical model is used in the design of construction works for soil conservation.

Technical model for community soil conservation

1. Fundamental policy of the model

1) Basic components

The model consists of the following basic components, which are expected to produce synergic effects.

a. Civil construction works

Damage caused by floods and soil runoffs is minimized and erosion aggravation is prevented through the construction of storm water banks, waterways, and contours. In addition, waterways are protected from flood-caused erosion through the construction of waterway protection structures.

b. Forestation and planting works

Storm water banks, contours, waterways and other structures are protected from flood-caused erosion through forestation and planting. In order to secure long-term continuity of these activities, local people's awareness of the need for environment protection is raised through their participation in forestation and planting works.

c. Fence building works

Fences are built in order to protect the vegetation from cattle and to contribute to its recovery.

d. Tree nursery construction works (optional)

Construction works for tree nurseries may be added optionally when target communities wish to produce seedlings as a way of contributing to soil conservation and greening activities in neighboring areas, or as a way of earning additional income.

2) Standard structure design

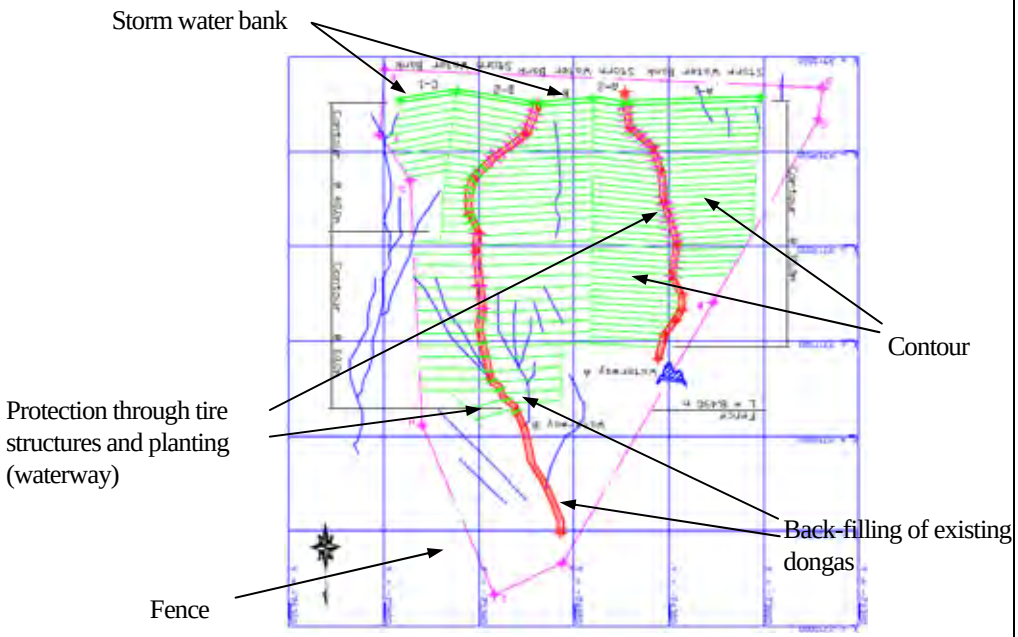
a. Structure layout

Two types of layout design are available, in accordance with their intended use: the PRIDE type and the Geen Einde type. Both designs serve to receive floodwater and soil runoffs from mountain areas through a bank system, and rainwater through a contour system, channeling them safely through waterways towards downstream areas.

The PRIDE type

Objectives:

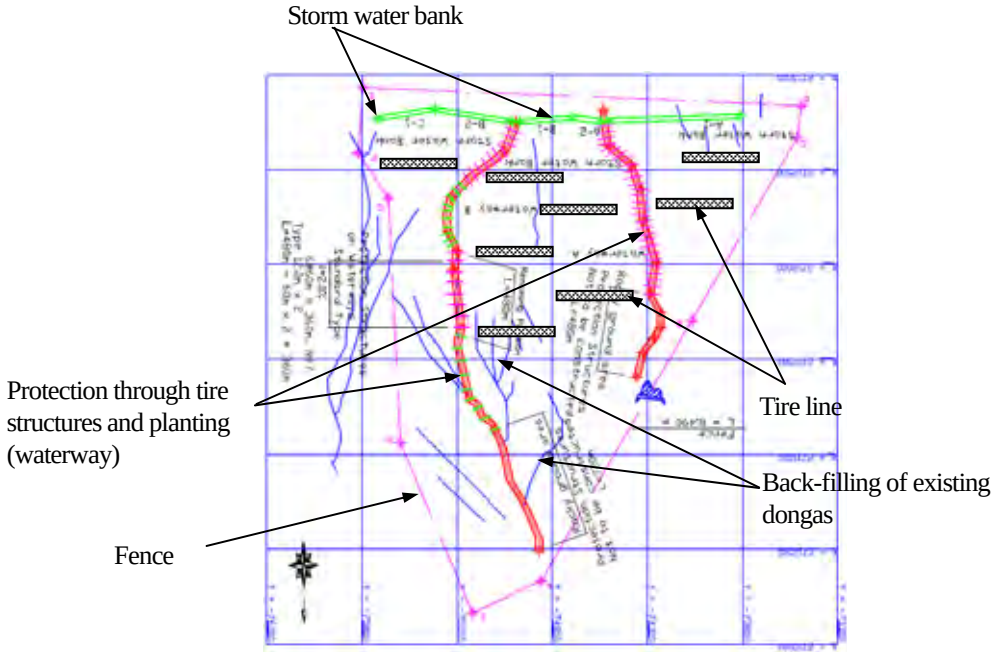
1) Protection of cultivated areas
2) Safe channeling of flood water
3) Stabilization of shallow dongas (expansion control)



The Geen Einde type

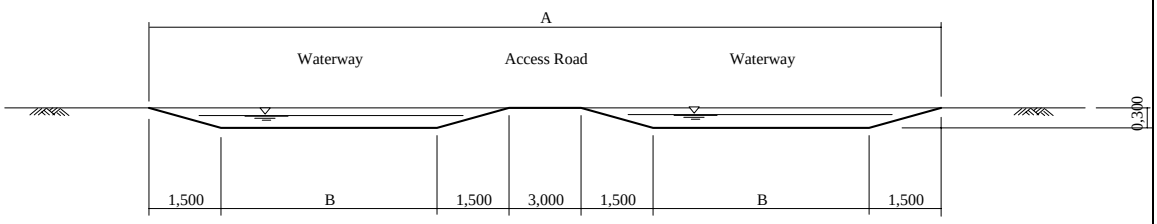
Objectives:

1) Safeguarding gentle mountain-side slopes used as pastures and cultivated land; preventing runoff of soil contained water; encouraging recovery of the vegetation
2) Safe channeling of flood water
3) Stabilization of shallow dongas (expansion control)



b. Cross section of waterways and their protection structures

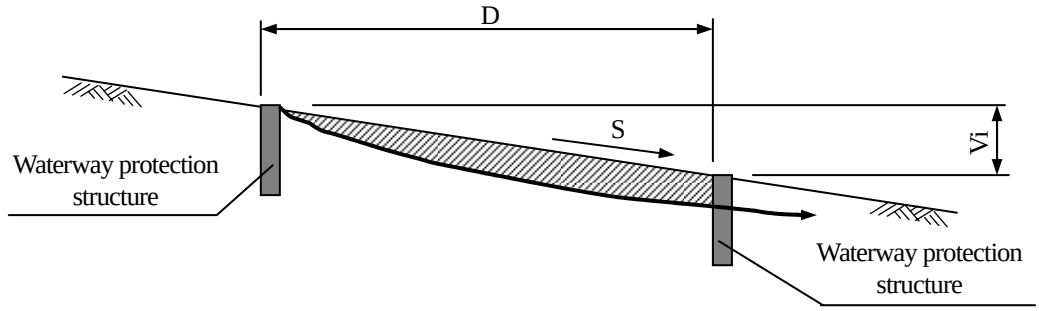
The waterway cross section is indicated below. Waterway flow rate, depth and width are determined in such a way as to ensure safety against flood flow.



The following waterway protection methods need to be used in order to prevent waterway surface from being deteriorated through erosion.

- Waterway protection structures built at regular intervals along waterway
  Materials such as stones and waste tires are used to build these structures. As the vegetation cover protects the waterways even when it is not fully grown or when its growth is uneven, it should be used as a complementary protection form.
- Development of a vegetation cover across the entire surface of the waterways
  Before building the waterway protection structures, seeds of bermuda, tef and other herbaceous plants are sown over the waterway area, and fertilizer is applied. After the waterway protection structures are build, the vegetation cover starts to form gradually over the waterways, protecting them from erosion.
- Planting vetiver grass on waterway slopes and at the top of the slopes
  Vetiver grass is planted on waterway slopes and slope tops in order to protect them. Special attention is given to the places such as storm water banks, and where contours flow in.

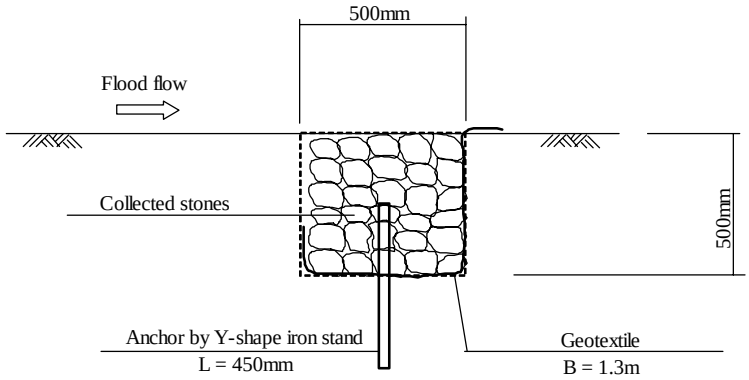
As shown in the figure below, waterway protection structures are built at regular intervals along the waterways in order to prevent deep erosion of the bottom of the waterway.



The next figure shows the cross-section of waterway structures. Materials such as stone and waste tires are used. Structures made of waste tires can consist either of a combination of tires placed horizontally and vertically, or of tires placed only horizontally, in the case of gentle slopes.

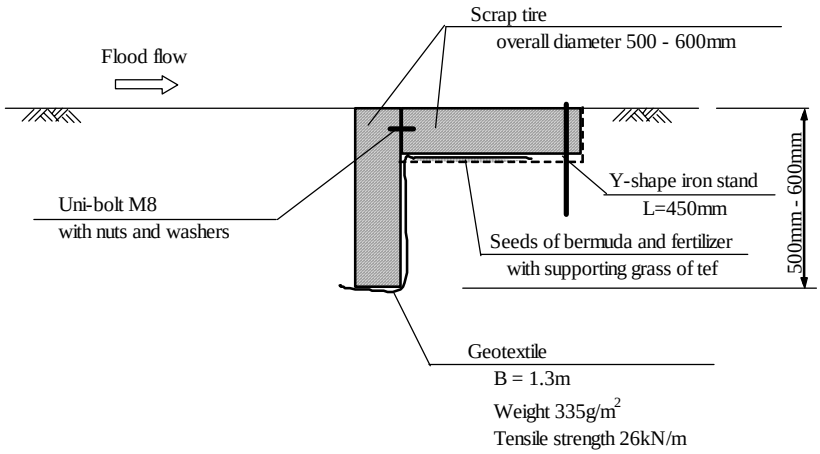
Type 1

– Using stone materials



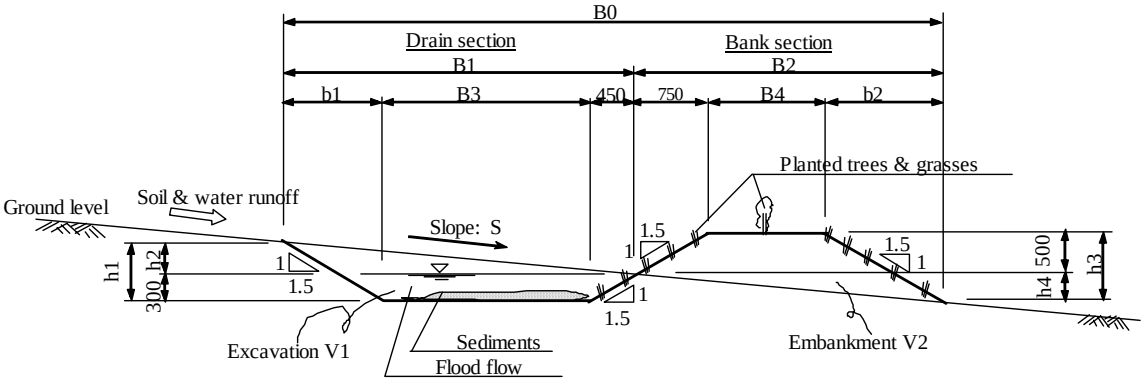
Type 2

– using waste tires



c. Bank and contour cross-section

The cross-section of storm water banks and contours is shown below.



2. Planning, design, and construction processes

Figure 11-2 shows the standard processes for planning, design, and construction. A brief overview of the processes is given below.

- 1st year – Preparation phase: Applications from communities, screening, and selection.

- 2nd and 3rd year – Implementation phase:
  2nd year: Creation of participatory plans; completion of waterways and waterway protection.
  3rd year: Storm water banks, contours, forestation and planting, and fence completion.
- From the 4th year - Maintenance phase: Maintenance of completed structures, forestation and planting.

With regard to implementation phase processes, the construction of waterways and waterway protection structures in the 2nd year should be completed in the first half of the rainy season (November and December), when precipitation is still moderate, in order to avoid the possibility of flood damage during the construction. Planting for waterway protection should also be completed during the first half of the rainy season, in order to achieve vegetation growth from the early stages of the works.

1) Preparation phase

Applications are received from communities, and target communities are selected based on the following screening criteria.

- Objective of the soil conservation project
- Situation of candidate target areas – inclination, water availability, soil, vegetation, and farming
- Community organization
- Local people's willingness

2) Participatory planning – Implementation phase (1)

A participatory planning is conducted using PRA method, with Head Office, district office and extension officers acting as facilitators.

- Grasping the situation based on transect work and resource mapping
- Discussion of problems and possible solutions
- Discussion of the soil conservation plan
- Creation of the soil conservation map

3) Support from LDA staff – Implementation phase (2)

Head Office and district office and extension officers provide support in the following areas.

a. Detail survey and designing
b. Procurement of constructors
c. Supervision of construction, forestation, and planting works with the residents' participation

4) Works realized by residents – Implementation phase (3)

Residents engage in the following activities with support from provincial and district personnel and extension workers.

a. Planting works executed on waterways
b. Construction works for waterway protection structures
c. Fence construction works
d. Forestation and planting works on storm water banks and contours

5) Maintenance phase

Residents have responsibility for the followings.

a. Establishment of a maintenance system
b. Maintenance of structures, forestation and planting activities

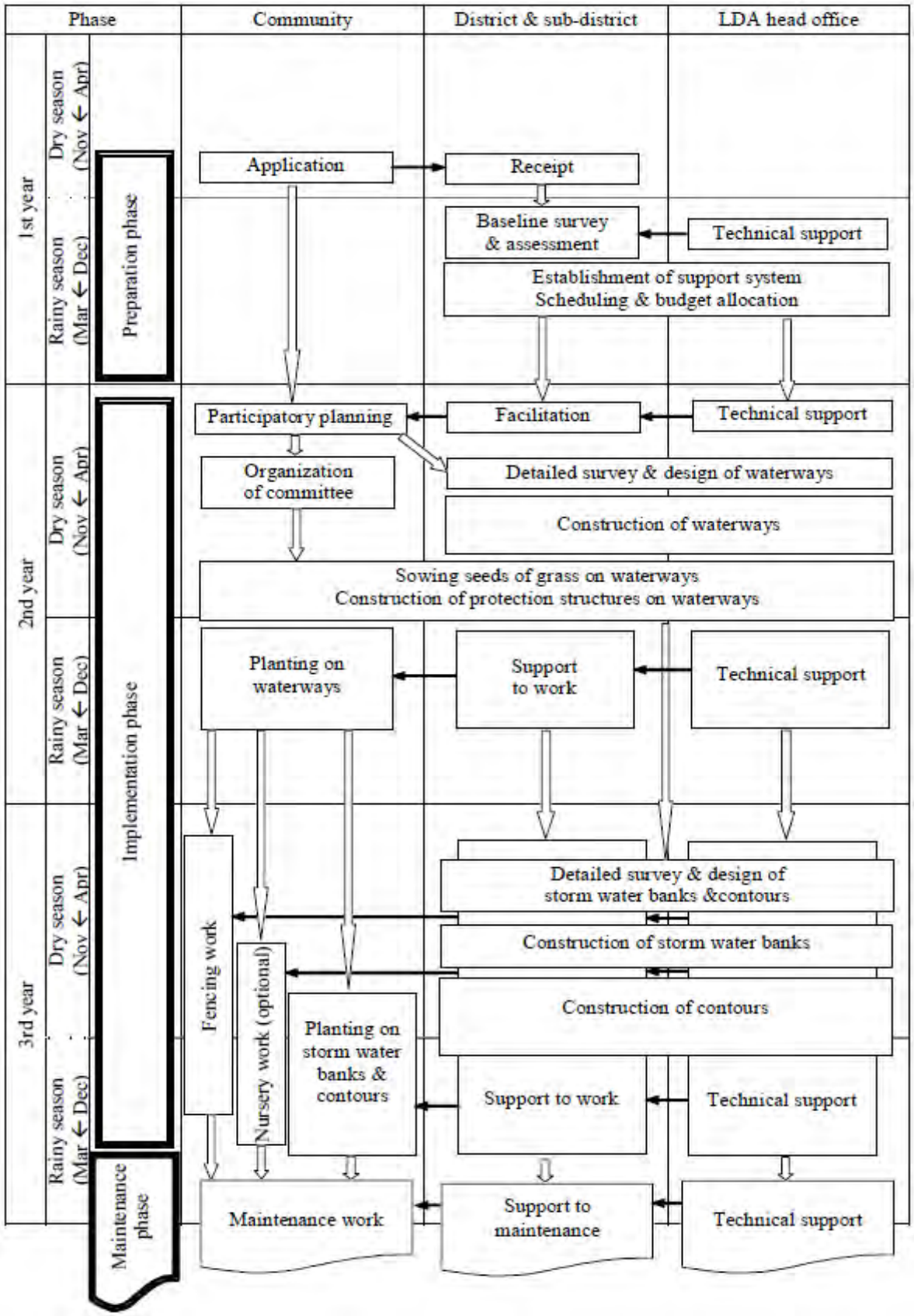


Figure 11-3 Standard process of community soil conservation activities

(6) Implementation system

LDA and community members implement the project based on the following demarcation of roles.

Related parties	Division of roles
Community members	**Actors of planning, implementation, and management activities** - Applications for project implementation - Participation in activities of participatory planning - Organization of committees - Participation in construction activities, forestation and planting activities - Implementation of sustainable maintenance activities
Extension officers	**Instructions and guidance to residents** - Communication with communities - Facilitation of the community activities - Instructions and support to the community activities - Assistance to the activities of district office personnel
District office	**Arrangements for various activities** - Support to the activities of the extension officers - Coordination of various project activities - Assistance to the activities of Head Office personnel
Head Office	**Technical and financial support** - Screening and selection of target communities - Coordination within the Head Office and with relevant institutions - Detail survey and designing - Procurement of constructors - Supervision of works executed by constructors and the communities - Support for the procurement of materials and machines

11.4 Action Plan

(1) Establishment of the implementation unit

As a system for the implementation of activities in the master plan, LDA forms “activity units” composed of 1 Head Office member, 1 district office member and several extension officers. These activity units act as implementation units of all activities, including soil conservation, greening, extension, and repair activities. Roles of constituent members of each activity unit are indicated below.

Member	Division of roles
Head Office personnel	Formulation of activity plans Technical and financial support Liaison and coordination with relevant institutions
District office personnel (or an external supporter, an intern)	Coordination of each activity Assistance to Head Office personnel
Extension officers	Communication with communities Facilitation for communities

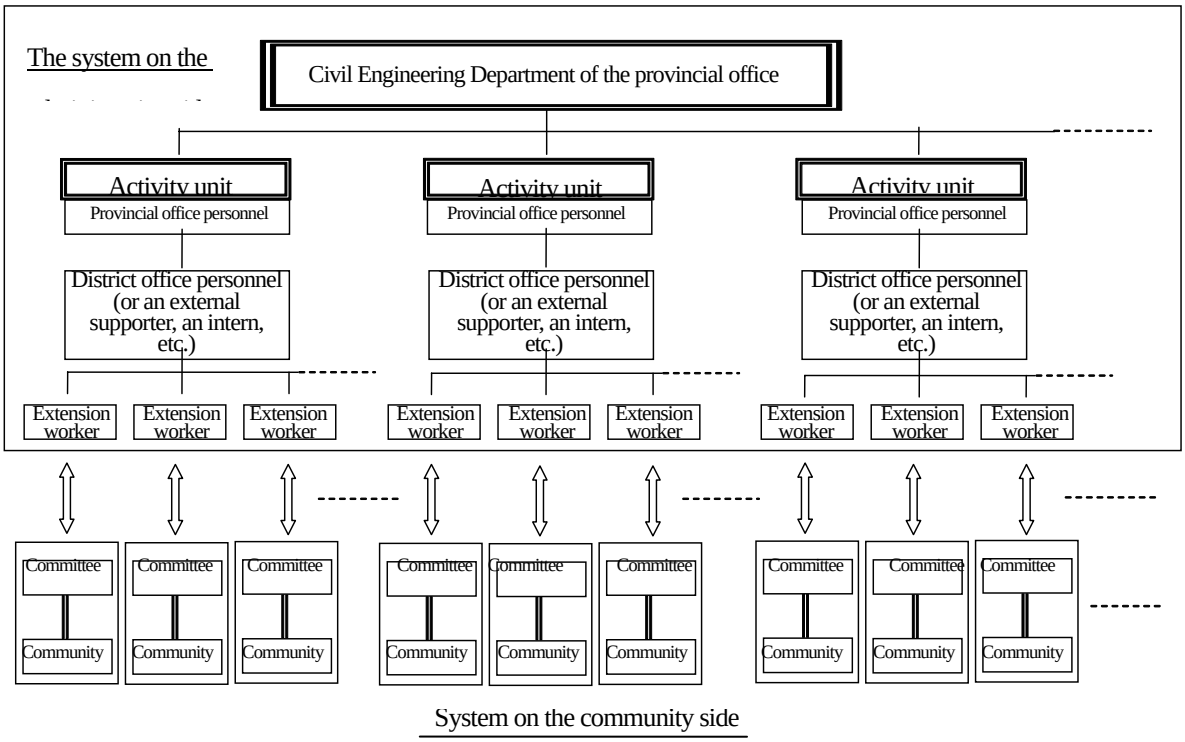
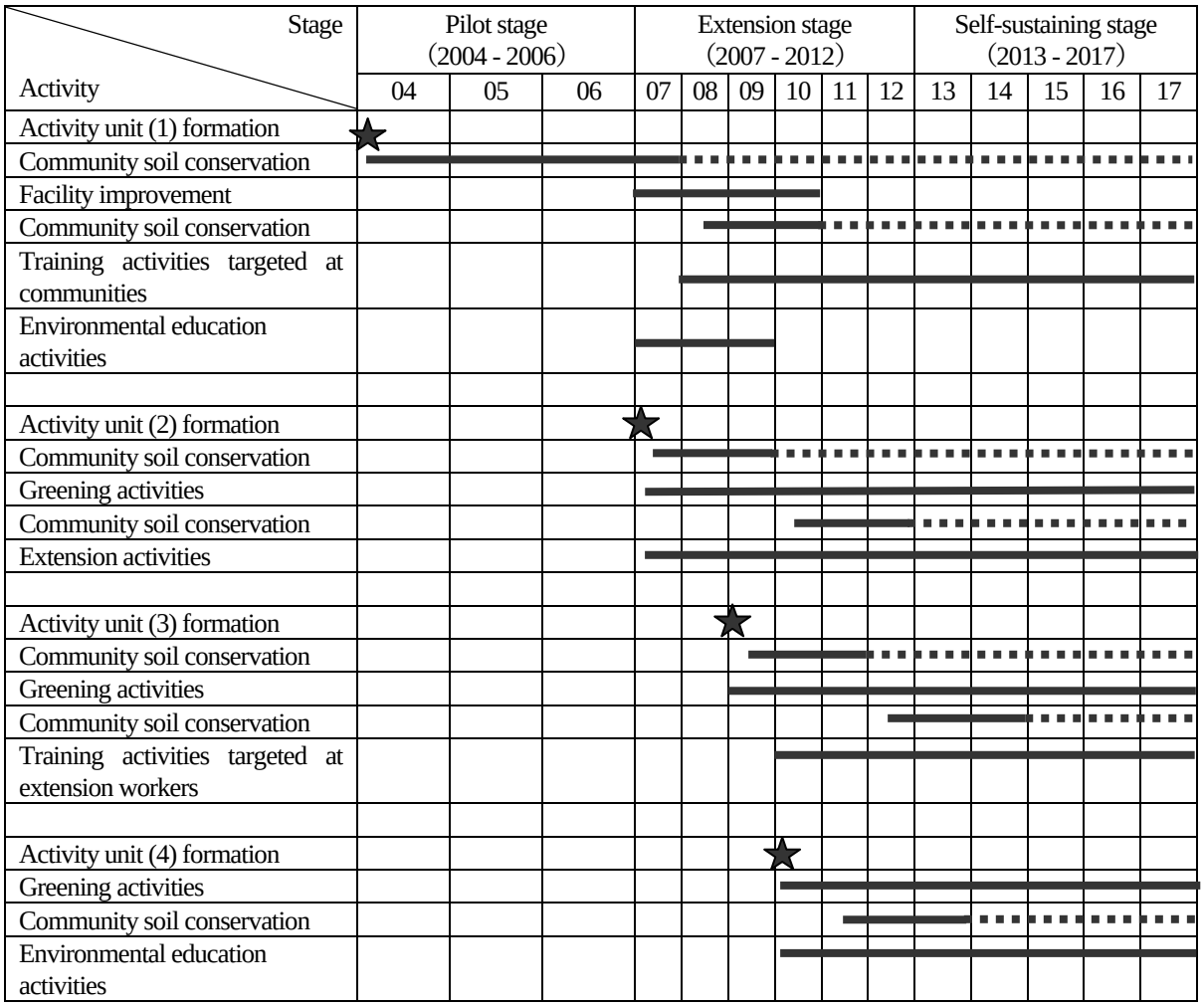


Figure 11-4 Implementation system based on the cooperation between the administration and communities

When adequate human resources cannot be assigned to district offices, use of external supporters and interns should be taken into consideration. In addition, a liaison and coordination center is established in the Agricultural Engineering Section of the Head Office in order to oversee and coordinate activity units.

As part of the implementation system on the community side, soil conservation committees are organized within communities. These committees cooperate with LDA activity units and make arrangements for community participation in each activity, including project planning, implementation, and management.

Three to five activity units will be constituted during the first four years of the extension stage. Examples of activity unit formation and activity planning for each unit are given in the table below.



Note: Continuous lines indicate implementation; dash lines indicate post-completion follow-up (maintenance support).

(2) Action plan for the extension stage and the autonomous stage

Community soil conservation

Activities are implemented based on the guidelines indicated in "11.3. Framework of the Master Plan"

and “(5) Technical models.” Throughout the extension stage, 1 or 2 new target communities are designated each year. In the self-sustaining stage, providing maintenance support to participating communities becomes the central activity. The table below shows an example of an activity schedule. As construction machines owned by LDA broke during the pilot project of this study, a machine procurement plan is formulated for the first year of the extension stage, and methods for machine procurement are discussed.

Example of activity schedule

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Pilot project continuation											
Formulation of machine procurement plan											
Machine procurement											
Selection of new target communities											
Planning and design creation											
Implementation											
Maintenance											
Selection of new target communities											
Planning and design creation											
Implementation											
Maintenance											
Selection of new target communities											
Planning and design creation											
Implementation											
Maintenance											
Selection of new target communities											
Planning and design creation											
Implementation											
Maintenance											
Selection of new target communities											
Planning and design creation											
Implementation											
Maintenance											

Facility improvement

Based on the “11.2. Basic policies in formulating the master plan,” detail survey and construction design are carried out during the first year of the extension stage, followed by the realization of improvement works from the 2nd year through the 4th year. An example of an activity schedule for facility improvement are given below.

Example of activity schedule

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Detail survey and design for the improvement of the Lepellane Dam											
Improvement works for the Lepellane Dam											
Detail survey and design for the improvement of small-scale dams											
Improvement works for small-scale dams											

Greening activities

a. Designation of greening areas

Wide participation of local residents should be encouraged, aiming to foster their environmental awareness. Tree seedlings are bought from the Community Forestry Project's nurseries, from the Rusplass nursery of the DWAF, and from private nurseries. Seedlings are distributed to communities, where forestation activities are carried out. Residents attend training programs on seedling management methods. Schools, market vicinities and other places with potential for stimulating people's awareness are designated as greening areas. The project aims to distribute 1,000 tree seedlings annually.

b. Control of soil runoff around waterways and dongas and for the erosion aggravation

The aggravation of erosion in heavily eroded dongas and the vicinity of waterways can be prevented by planting seedlings and seeds of vetiver grass and other herbaceous plants. The project aims to carry out planting activities on a surface of 100 ha annually.

c. Promotion of community forestry

Refer to the section on "Community forestry" in the Chapter 10. The table below shows an example of a greening activity schedule.

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Selection of greening areas and target areas											
Implementation											

Environmental education activities

a. Promotion of school forests and school extracurricular activities

Activities are implemented throughout the extension and the self-sustaining stages in order to raise the environmental awareness of primary and secondary pupils. Example of environmental education activities are given below.

1) Creation of brochures related to environmental education activities
2) PR activities at primary and secondary schools
3) Promotion of forestation activities (school forests) with primary and secondary schools
4) Support for school trips to soil conservation and other project sites, as extracurricular activities of primary and secondary schools

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Creation of brochures	▬										
PR	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
Implementation	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬

Extension activities

a. Use of the Mobile Information Unit

The Mobile Information Unit constituted in the pilot project of this study is used for extension activities in which successful examples of soil conservation are transmitted to communities.

b. Use of the demonstration site for information sharing

For broad-based extension of soil conservation and other activities of environmental conservation, people interested in community soil conservation, community forestry and other environment protection activities are invited to study tours to project sites. The table below shows an example of an extension activity schedule.

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Creation and updating of materials for mobile information units	▬	▬	▬	▬	▬	▬					
Implementation of extension activities by mobile information units	▬	▬	▬	▬	▬	▬					
PR on display and exchange activities	▬	▬	▬	▬	▬	▬					
Implementation of display and exchange activities	▬	▬	▬	▬	▬	▬					

Training activities for extension workers

In the extension stage, both extension officers who have been in charge of target communities and others attend training programs with the following content.

1) Discussion of problems and improvement methods related to the activities of extension
2) PRA and other participatory method
3) Implementation methods for the soil conservation project
4) Examples of implementation of soil conservation and environment protection projects

Instructors are chosen from among members of LDA activity units. Training materials include the "Project Promotion Guidelines for the Project Staff," and other case examples of projects as necessary. Training is conducted in 2 or 3 sessions/year, using new case examples every year.

In the self-sustaining stage, instructors and extension officers jointly discuss on the following topics, guidance being conducted in such a way as to link all decisions on improvement measures to activities.

1) Selection of case projects and/or activities to be discussed
2) Study tours to sites related to the case projects and/or activities
3) Discussions with communities related to the case projects and/or activities
4) Evaluation of the case projects and/or activities (evaluation methods are specified in the "Project Promotion Guidelines for the Project Staff" formulated in the pilot project of the present study)
5) Examination of improvement measures regarding the case projects and/or activities
6) Decision of improvement measures for the case projects and/or activities

This training is conducted as a series of several sessions, over a longer period of time. Every year, the

projects/activities selected as cases for the training are different. An example of an activity schedule is given below.

Stage / Activity	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Training plan formulation	▬	▬	▬	▬	▬	▬					
Training implementation	▬	▬	▬	▬	▬	▬					
Training plan formulation							▬	▬	▬	▬	▬
Training on the 1st target activity							▬				
Training on the 2nd target activity								▬			
Training on the 3rd target activity									▬		
Training on the 4th target activity										▬	
Training on the 5th target activity											▬

Training activities for community members

In the extension stage, training on operation and maintenance activities is conducted for community members, based on the "Maintenance Manual for Communities". Instructors are members of LDA activity units.

In the self-sustaining stage, discussions are carried out in relation to the following issues. Where decisions have been made on improvement measures, attention is paid to putting them into action.

1) Identification of problems in maintenance activities
2) Examination of improvement measures for maintenance activities
3) Determination of improvement measures for maintenance activities
4) Action

Stage / Activity	Extension stage (2007 - 2012)						Sel-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Training plan formulation	▬	▬	▬	▬	▬	▬					
Training implementation	▬	▬	▬	▬	▬	▬					
Training plan formulation							▬	▬	▬	▬	▬
Training implementation							▬	▬	▬	▬	▬

(3) Implementation budget estimate

The implementation budget estimate for each activity is given below.

(Unit: thousand rand)

Stage / Item	Extension stage (2007 - 2012)						Self-sustaining stage (2013 - 2017)				
	07	08	09	10	11	12	13	14	15	16	17
Community soil conservation											
Pilot project continuation	4,800										
Newly selected areas for 2007		2,500	2,500								
Newly selected areas for 2008			2,500	2,500							
Newly selected areas for 2009				2,500	2,500						
Newly selected areas for 2010					2,500	2,500					
Newly selected areas for 2011						2,500	2,500				
Maintenance support	200	200	200	200	200	200	200	200	200	200	200
Subtotal	5,000	2,700	5,200	5,200	5,200	5,200	2,700	200	200	200	200
Facility improvement	300	2,000	500	500							
Greening activities	300	300	300	300	300	300	300	300	300	300	300
Environmental education activities	100	100	100	100	100	100	100	100	100	100	100
Extension activities	100	100	100	100	100	100					
Training activities for extension officers	50	50	50	50	50	50	100	100	100	100	100
Training activities for communities	50	50	50	50	50	50	100	100	100	100	100
Total	5,900	5,300	6,300	6,300	5,800	5,800	3,300	800	800	800	800

Note: 1 or 2 areas are selected each year for community soil conservation. These can be either 1 area with a medium-scale surface (about 200 – 300 ha) or 2 area with a small-scale surface (about 100 ha). The upper limit of the budget has been set to 2, 5 million rand/year.