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ARUSHA REGION

41286

INTEGRATED DEVELOPMENT PLAN

VOLUME FOUR

**ARUSHA REGION
MAJOR AREAS FOR
LONG-TERM INVESTMENTS**

**Prepared By
THE REGIONAL DEVELOPMENT DIRECTORATE
ARUSHA REGION
With The Assistance Of
THE ARUSHA PLANNING AND VILLAGE DEVELOPMENT PROJECT**

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18th December, 1982

During the four year period beginning in July 1979 Arusha Region has been assisted by the USAID-sponsored Arusha Planning and Village Development Project in the implementation of a large number of village development activities and in the preparation of the Region's Integrated Development Plan. It is a great pleasure to me that this Plan has now been completed and that I am able to write this short forward.

The Arusha Region Integrated Development Plan includes a comprehensive description of the current status of development in the Region, an analysis of constraints to future development, and the strategies and priorities that the Region has adopted for guiding its future development. It also includes a review of projects in the Region's Five Year Development Plan as well as priority projects for long term investments.

The preparation of the Plan has involved many meetings at the Regional, District and village level, and the goals, strategies, objectives and priority projects included in the Plan fully represent the decisions of the officials involved in those meetings. I am confident that the Plan will provide a very useful frame of reference for guiding the economic and social development of Arusha Region over both the medium-term five year period and the next 20 years. The total size of the identified projects and programmes is well beyond the normal scope of the financial resources of the Regional budget. Therefore, one function of this document is also to present the necessary facts and justification for attracting assistance from potential sources outside of the Region to carry out priority projects which address the specified development objectives of the Region. The Plan is by no means exhaustive, and there is room for interested organizations to explore other potential investments. Our Plan is therefore a base for future comprehensive planning.

I would like to take this opportunity to congratulate the Regional Planning Office staff and the team from Development Alternatives, Inc., which undertook the implementation of the Arusha Planning and Village Development Project, for their hard work and many accomplishments and to thank all those Regional Government, Ministry, Parastatal, and Party officials who, in one way or another, gave them the necessary assistance and cooperation.



J. A. Mhaviile

REGIONAL COMMISSIONER
ARUSHA

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SUMMARY

Arusha Region is endowed with rich natural resources. Almost 95 percent of the population is dependent on its land and water for their survival and improved quality of life. At the outset of its regional planning and development effort, the Region defined five main development goals: 1) village reliance; 2) improved equity; 3) economic growth; 4) regional integration; and 5) the protection of its natural resources.

The Region, through the Arusha Planning and Village Development project, financed by the Government of Tanzania and the United States Agency for International Development, undertook an extensive planning effort complemented with the testing and implementation of development activities, primarily in the three agricultural districts of Arumeru, Hanang, and Mbulu. Based on the planning and implementation efforts of the Region, it identified a set of policy decisions to guide regional development which were summarized in four main strategies:

- Strategy One: Integrated development activities that emphasize village level land use planning and reduce population growth rates.
- Strategy Two: Highest priority given to directly productive activities.
- Strategy Three: More efficient use of existing manpower, equipment, materials, and finances in support of regional development activities.
- Strategy Four: New efforts to obtain additional resources for development.

In the preparation of the Region's medium-term plan, these strategies and priorities were incorporated. For the long-term plan, the Region decided to identify eight long-term investment objectives, highlighting the medium-term and long-term projects that require external funding. These objectives and the estimated funding requirements in millions of Tanzania shillings are outlined below:

- Objective One

Increase food crop supplies to feed adequately the growing population of Arusha Region, and to continue to provide a surplus for national consumption in a self-sustaining way.

Medium-Term Plan

79.5

Long-Term Plan

559.0

- Objective Two

Develop the livestock industry for local and national consumption and for export.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
52.5	425.0

- Objective Three

Generate revenue, including foreign exchange, and employment through export crops, tourism, and industries that add value to the region's natural resources.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
20.6	3,160.00

- Objective Four

Develop and maintain a communications network that contributes to economic development.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
44.8	394.4

- Objective Five

Establish and maintain water supply system to promote productivity and the quality of life in rural villages.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
36.0	360.0

- Objective Six

Increase the availability of energy supplies through the development of forestry, hydroelectric, and other resources.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
16.0	367.0

- Objective Seven

Develop the capabilities of district councils and villages to make investments that improve self-reliance and the quality of life in villages.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
35.4	352.0

- Objective Eight

Improve and protect the environment of the Region for accomplishing the above objectives through the better use and conservation of its natural resources and through the slowing of population growth rates.

<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
137.5	38.0

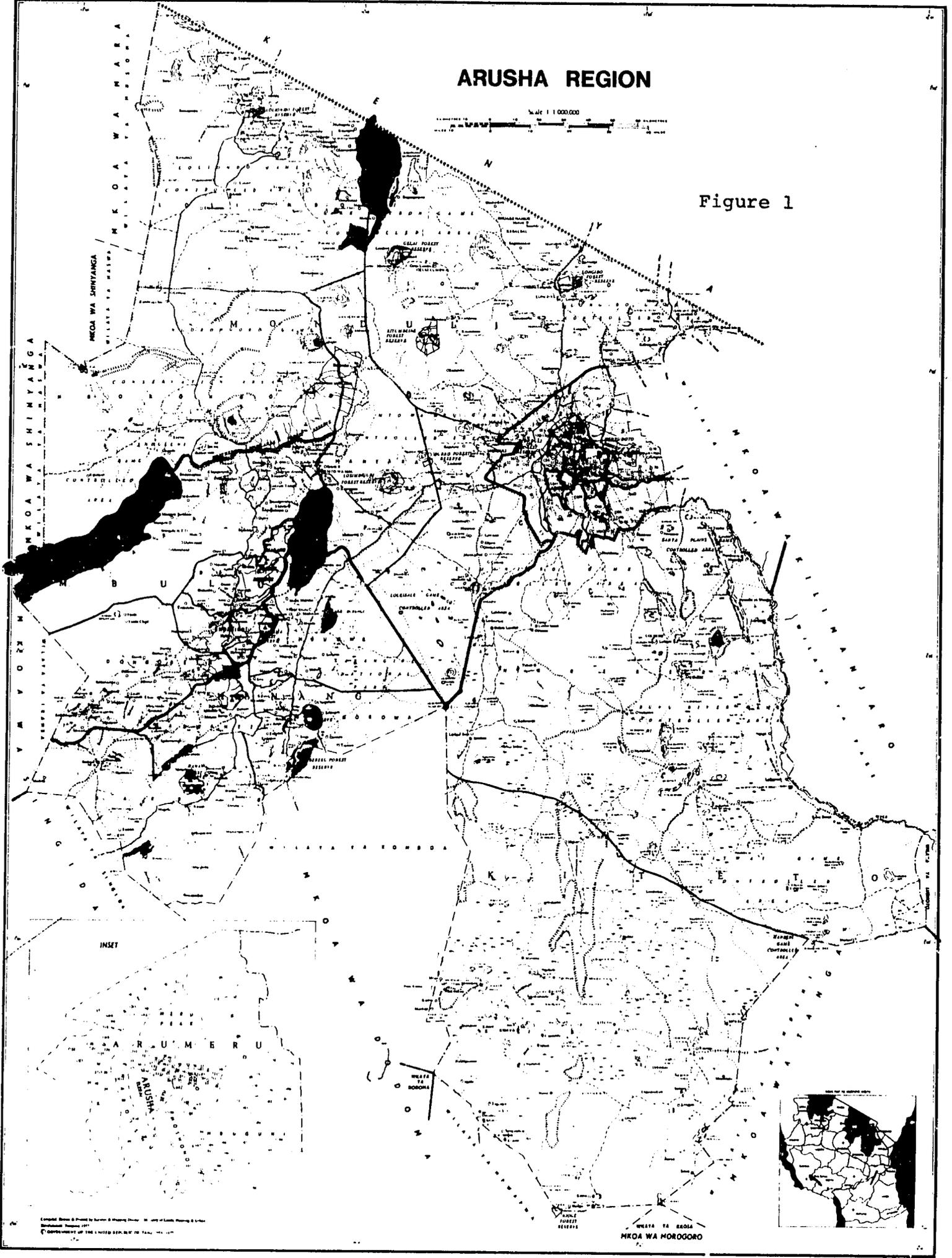
TOTALS:	<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
	422.3	5,655.4

The projects included for external funding consist of 422.3 million shillings for medium-term projects (which lay important groundwork for long-term development) and 5,655.4 million shillings for long-term projects. These represent major potential investments which will help the region to realize its development goals.

ARUSHA REGION

Scale 1:1,000,000

Figure 1



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MKOA WA MOROGORO

ARUSHA PLANNING AND VILLAGE DEVELOPMENT PROJECT

Livestock, Wildlife and Land Use Survey, February 1980

ARUSHA REGION AND DISTRICTS

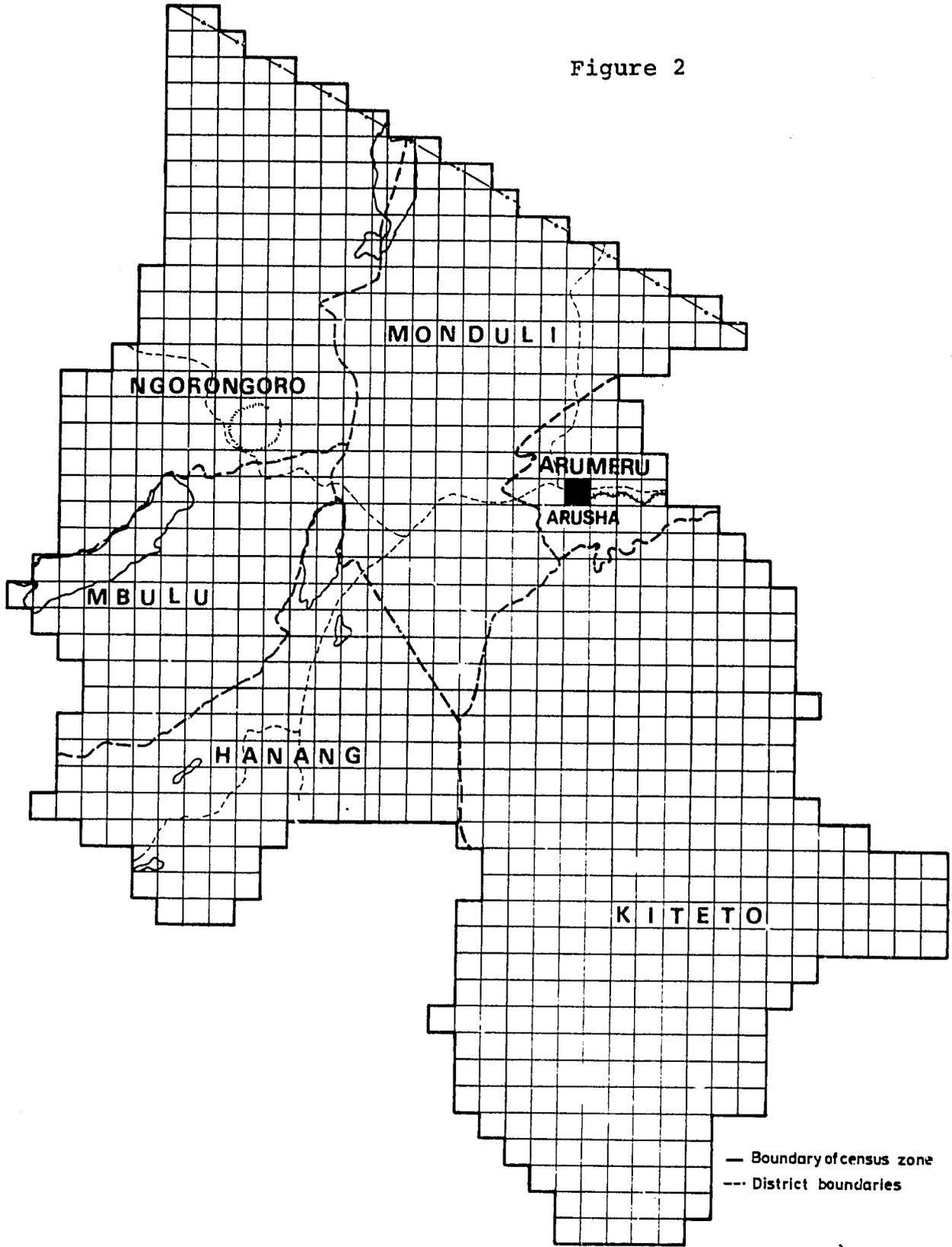


Figure 2

**SUMMARY STATISTICAL PROFILE
ARUSHA REGION**

<u>Location</u>	North-central Tanzania, bordered by Kenya on the northeast, and Tanzanian regions of Kilimanjaro, Tanga, Dodoma, Shinyanga, and Mara.
<u>Size:</u>	82,428.5 sq km.
<u>Climate:</u>	Mild, average temperature 22° C. Variation in rainfall between the mountains and the lowlands, ranging from 500 to 1,000 mm a year.
<u>Natural Resources:</u>	<p>National forest -- 2,345.0 sq km (3 percent of the total land area).</p> <p>National Parks and Ngorongoro Conservation Area -- 8,809.0 sq km (10.7 percent of total land area). Wildlife population -- 2 million.</p> <p>Lakes and dams -- 3,571.0 sq km (4 percent of total land area).</p> <p>Cultivable land -- 8,506 sq km (10.3 percent of total land area).</p> <p>Grazing land (including Ngorongoro Conservation Area) -- 66,559 sq km (80.7 percent of total land area).</p>
<u>Population:</u>	1981 -- 1,035,761 (1978 -- 928,478) -- 92 percent located in rural areas, annual growth rate 3.8 percent; thus, the population in all districts will double by the year 2000.
<u>Administrative Structure:</u>	A regional government overseeing 1 town council, 6 districts, 26 divisions, 128 wards, and 463 villages.

Physical

Infrastructure: Airports -- one international, numerous small airstrips.

Roads -- 4,562 km of which 243 km are tarmac, 1,539 km murram/gravel, and 2,780 km earth.

Water systems -- almost 48 percent of the population is provided with safe water.

Dams -- 12.

Hotels -- 21 tourist hotels and 114 guest houses.

Health facilities -- 9 hospitals, 10 health centers, 122 dispensaries, and 60 village health posts.

Schools -- 2,474 primary classrooms, 10 secondary schools, 15 technical schools, and 2 colleges.

Businesses -- 190 village shops, 85 cooperative shops, 26 corporations, 161 grinding mills, 254 bars, 199 stores, 14 hardware stores, and 8 pharmacies.

Principal Economic Activities

Agriculture: Produces about 40 percent of the gross regional product. In 1979-1980, 579,000 tons of agricultural commodities were produced, earning about 650 million Tsh.

(in tons)

● Main food crops:	Maize	324,250
	Mixed Beans	50,315
	Millet	8,810
● Main cash crop:	Coffee	17,956
	Wheat	95,014
	Seed beans	27,770
	Sorghum	45,639

Livestock: Produces about 40 percent of the gross regional product.

Wildlife and Tourism: Produces about 5 percent of the gross regional product.

Employment Structure:

95 percent of the people are agriculturists/pastoralists; 1.3 percent (12,174 posts), civil servants. The remainder are employed by parastatals or private enterprises, or are self-employed.

Quality of life Indicators:

Health -- life expectancy 51 years.

Infant mortality rate -- 130 deaths per 1,000 births.

Percentage of school-age children enrolled in primary school -- 91 percent.

Economic -- per capita income, 2,432 Tsh (1980, based on National Economic Survey); 1,650 Tsh (1980, based on estimated gross regional product).

Food production in kilocalories per capita per day -- 3.818.

INTRODUCTION

The purpose of Volume Four of the Arusha Region Integrated Development Plan is to outline the major areas for investment over the next 20 years. It builds upon the findings and development decisions incorporated in the first three volumes of the Plan which include:

- Volume One: ARUSHA REGION TODAY: 1981, which outlines the current development status, trends, and constraints in the Region;
- Volume Two: ARUSHA REGION: DEVELOPMENT STRATEGIES AND PRIORITIES FOR THE NEXT 20 YEARS, which presents the Region's main policy decisions to guide development to the year 2000; and
- Volume Three: ARUSHA REGION: MEDIUM-TERM PLAN 1981/82-1985/86, which presents the projects for funding under the region's five year plan, including a detailed project proposal for the follow-on to the Arusha Planning and Village Development Project (APVDP).

Within the development framework established by the Region, this part of the plan will outline the Region's critical investment objectives and the priority projects and project ideas for accomplishing these objectives. As a prelude to the long-term projects, a quick review is made of the critical medium-term projects under each development objective to give the background for the long-term projects and to show the basis that is being laid for them during the medium-term plan.

1. Regional Development Goals

Regional policy, planning, and investment decisions are guided by five main development goals established by the region early on in the planning process. These goals provide the broad framework for regional development decisionmaking and include:

- Increase village self-reliance, as measured by an expansion of village capabilities to solve their own problems;
- Improve equity, as measured by poorer areas receiving development benefits in a manner that is self-sustaining;
- Promote economic growth, as measured by increases in the Gross National Product and in the generation of foreign exchange earnings;
- Improve regional integration, as measured both by stronger commercial, institutional and cultural stronger linkages within the Region, and by stronger linkages with national and international sources of capital and markets; and
- Protect natural resources, as measured by the development of sustainable production systems.

2. The Planning Process

With the establishment of the Region's development goals, the Region adopted an evolutionary approach to planning, the essence of which is to build upon knowledge and experience gained, making modifications and additions as circumstances change rather than relying on a "blueprint" for development. This approach combined an intensive information gathering and analysis effort with the lessons learned from the actual implementation of development activities. An initial emphasis in the planning approach was to realistically assess the availability of resources and their better utilization. Further, it was decided that decisionmaking would be done by regional and district officials, with external technical assistance personnel integrated fully into the planning structure and process.

After establishing the Region's development goals and planning strategy, the Region decided that planning should be based on the definition of agro-ecological zones, refined into planning units taking into account economic, social and administrative factors. With these decisions, the steps in the planning process involved:

- Definition of agro-ecological zones through the use of earth satellite photos, aerial photos and census, and slope map analysis which resulted in 245 distinct zones that were later organized into planning units by district officials;
- Analysis of population growth and movement to determine resulting land use pressure;
- Preparation of sector-specific background and assessment papers to identify specific problems and potentials;
- Identification of village economic activities and infrastructure through a rapid reconnaissance survey of 150 villages (about 30 percent); and
- Development of background papers which cut across sectors such as manpower, the availability of financial resources, implementation problems and soil conservation.

The insights from the planning exercises were complemented by the lessons learned from the initiation of development activities to test approaches and project ideas. Major activities were carried out in the directly productive sectors of agriculture, livestock, natural resources, and rural industries. Supporting infrastructure for these activities was developed through the rural water and roads rehabilitation and development activities.

About 350 documents from both the planning and implementation activities have been produced and are listed in the attached bibliography (Annex A). The conclusions from this work were summarized as resource material for regional and district policy and planning papers. On the basis of regional and district deliberations, the strategies and priorities, investment objectives and possible projects of the region were formulated.

3. Regional Strategies and Priorities

The analyses done under the planning exercise show that there are two main constraints that will influence regional development over the coming years. The first is the current national economic

situation which shows that the central government will not be able to provide the region with additional financial support, measured in real terms, in the foreseeable future. The regional planning documents highlight that by the year 2000, the population of all districts will double. Moreover, this doubling of population, when coupled with needed complementary growth in economic activity, will increase competition for available land and place increased pressures on the environment.

The above constraints led the Region to the conclusion that its development over the next two decades should be based on four main strategies:

STRATEGY ONE: Integrated development activities that emphasize village-level land use planning and reduced population growth.

This first regional development strategy calls for land use planning combined with a concentration of government resources in specific geographic areas and the gradual extension to other areas. It also calls for the development of village planning and implementation capabilities in the areas of geographic concentration and the introduction of family planning and migration control programs to alleviate land pressures and to help ensure the economic and social well-being of rural people.

STRATEGY TWO: Highest priority given to directly productive activities.

This second regional development strategy calls for giving the highest priority to directly productive activities in order to build village financial and organizational capabilities so that they can finance quality of life improvements. Since agriculture and livestock provide the economic base for the Region, these sectors and related industries which add value will be the major emphasis of regional planning and development. Emphasis will also be placed on natural resources, particularly forestry because of the extensive use of wood as an energy source.

STRATEGY THREE: More efficient use of existing manpower, equipment, materials, and finances in support of regional development activities.

This third regional development strategy calls for the more efficient use of those manpower, equipment, material, and financial resources available to the Region. The starting point for the implementation of this strategy is to improve the planning, implementation, monitoring and evaluation capabilities of the Region and districts. With limited resources, significant progress can also be made by training regional manpower in management and technical skills. Financial resources can best be utilized to fund the operation and maintenance of existing roads, water systems, and social service facilities. Much progress will be made by creating industries that produce needed materials and by improving maintenance and by standardizing equipment.

STRATEGY FOUR: New efforts to obtain additional resources for development.

The current macro-economic situation suggests that there will be few additional resources, in real terms, from the central government in support of regional development activities for the foreseeable future. Therefore, the Region must increase its revenue through alternative mechanisms such as user contributions, borrowings from financial institutions, and loans and grants from external sources. Moreover, the Region requests that the central government consider:

- Increasing the proportion of government development expenditure in the Region that is channeled through the government development budget; Currently only 10 percent of all development expenditures are channelled through the development budget, and the remainder of the expenditures are budgeted for parastatals and line ministries); and
- Exploring means by which additional operation and maintenance funds could be made available to the Region.

Further, the Region sees the possible contribution of parastatal and line ministry resource investments to regional development goals but only if the Region actively participates in the decisionmaking process. Through the above means, this fourth strategy calls for securing additional resources for development, with the Region taking the primary initiative in generating these revenues.

These four strategies, supported by a series of policy decisions and initial project ideas, are elaborated in Volume Two: ARUSHA REGION: DEVELOPMENT STRATEGIES AND PRIORITIES FOR THE NEXT 20 YEARS.

4. Statement of Investment Objectives

In the process of preparing its long-term plan for the next 20 years, the Region has defined a set of investment objectives that take into account its four main strategies for regional planning and development and the findings of its planning process and development experience. These specific investment objectives include:

- Increase food crop supplies to feed adequately the growing population of Arusha Region and to continue to provide a surplus for national consumption in a self-sustaining way;
- Develop the livestock industry of Arusha Region for the purposes of local and national consumption and export;
- Generate revenue (including foreign exchange earnings) and employment through the production of export crops, tourism, and industries that add value to the Region's natural resources;
- Develop and maintain a communications network that contributes to economic development;
- Establish and maintain water supply systems to promote productivity and the quality of life in rural villages;

- Increase the availability of energy supplies through the development of forestry, hydro-electric and other resources within the Region;
- Develop the capabilities of district councils and villages to make investments that improve self-reliance and the quality of life in villages; and
- Improve and protect the environment of the Region through better utilization and conservation of its natural resources and by slowing its population growth rate.

In the following sections of this part of the plan, the Region will briefly analyze each objective, identify the anticipated contribution made by the five year plan to achieving the objective (highlighting projects that still require external financing), and present project proposals and ideas to be developed for its long-term development.

I. OBJECTIVE ONE: INCREASING FOOD CROP SUPPLIES

The first investment objective of the region is to increase food crop supplies to adequately feed the growing population and to continue to provide a surplus for national consumption in a way that is self-sustaining. Although Arusha Region has been in the past the predominant food exporting region in Tanzania, it will become a food deficit area by 1990 due to its growing population and to lower levels of production.

1.1 Analysis of the Objective

Agriculture contributes an estimated 40 percent of the Gross Regional Product through only about five percent of the Region's 82,428 square kilometers is under production. Almost 95 percent of the people in the Region are engaged in agriculture, primarily subsistence agriculture, with an average farm size of about 2.2 hectares. The major agricultural centers are in Arumeru, Hanang, and Mbulu Districts, and production on more marginal lands occurs in the drier Districts of Monduli, Kiteto, and Ngorongoro.

The two main food crops consumed on-farm are maize and mixed beans, the production of which accounted for about 375,000 out of the 579,000 tons of agricultural production estimated for the Region on 1979-80. Using a factor of 180 kg. per person, the current rural population consumes about 180,000 tons of foodstuffs annually. The population projections for the Region are 1.2 million people in 1985 and 1.4 million in 1990. In order to maintain current food supply levels for this growing population, an additional 36,000 tons of food grains will be needed in 1985 and by 1990 an additional 72,000 tons. Meeting these needs will require increases in production of 10 and 20 percent respectively.

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Through the regional agriculture program, including the efforts of APVDP, the Region has taken steps towards improving production including the testing of crop packages, the strengthening of the extension service, the provision of improved (ox-drawn) implements, and pest and disease control. In addition, the Region has placed priority on land and water resource management and conservation, and is initiating small scale irrigation training and development.

However, production levels continue to decline for several reasons. The first are the natural constraints within the region, such as irregular rainfall and environmental deterioration. The environmental constraints are compounded by macro-economic factors, the most important of which are producer prices, the availability of foreign exchange for agricultural inputs, an ineffective delivery and marketing system and the lack of operational funds for the agriculture service. More specifically for the Region, there is a need to develop research-based, improved farm production technology, to improve the performance of the extension service for transferring agricultural knowledge to small farmers, to increase the availability of other farmer inputs and services, to develop water resources for crop production, and to adopt improved soil and water conservation measures for sustained production (which is discussed under objective eight).

1.2 The Medium-Term (Five Year) Plan

Under the Region's medium-term plan, the largest amount of resources programmed is for the agricultural sector. The plan combines a series of projects to lay the groundwork for the long-term sustainable increases in production with those that take advantage of known constraints and solutions for improved production.

For the longer-term, a critical project is to develop an adaptive research or testing program to improve on-farm production methods, particularly given the diverse ecological zones and farming systems in the Region. Further, the linkage between technology development and the transfer of this knowledge to farmers is critical; the present effort of the Region is to strengthen the extension services, using known technology, which will be further developed under the five year plan with emphasis on maize production. Over the long-term, an essential need is to link the findings of research-based, adaptive testing with the development of the extension services. Further efforts have been made by the Region to train its personnel in soil and water conservation, the full development of which is a priority investment objective.

Current regional investments and its medium-term plan highlight the importance of irrigated crop production as a means for achieving the necessary long-term gains in the supply of food crops. Under the plan, the emphasis is on training and on the initiation of small scale schemes, with the intent of developing the technology and know-how for larger scale schemes over the next twenty years as outlined below. In addition to irrigated crop production, another initiative under the five year plan is to introduce and test drought resistant crops for production in marginal areas.

In the shorter term, the Region's medium-term plan builds upon current initiatives and technological know-how. Of chief importance is the continued development of maize production and marketing which was initiated under the World Bank program. It calls for the continued development of the use of ox-drawn equipment through a project to establish seven ox-plough training centers. Under APVDP, a central factory for producing these implements was established in Arusha, supported by three district centers for the assembly and maintenance of ox-drawn equipment.

Also, the plan contains a project for continued control of pest damage to crops, an initiative supported by FAO. Further, the plan includes projects for fruit and vegetable nurseries and expanded oil seed production which are current initiatives of the Region.

To improve the delivery of inputs, the Region envisions under the five year plan a series of farm centers to service agricultural implements (where appropriate both tractor and ox-drawn), to provide necessary agricultural supplies, to add to the storage capacity of the Region, and to provide a place for extension assistance. Provision is made for seventeen such centers.

Outlined below are priority projects for external funding from the five year plan which are essential for increasing food crop supplies in Arusha Region:

Adaptive Research

12,500,000 T.Shs.

This project proposes to establish four adaptive research centers serving to develop, test, and teach improved agricultural production practices and systems for the diverse agro-ecological zones in the region. Linked with national research institutes, these centers will attempt to increase maize, mixed bean, and other crop yields given the constraints and potentials of existing farming systems and will train agriculture extension personnel on how to increase subsistence farmer production.

(See Vol.3: Arusha Rural Productivity Project, Part V, Section 2).

Extension and Information

10,500,000 T.Shs.

The Region has initiated pilot agricultural extension programs in the three agricultural districts of Arumeru, Hanang, and Mbulu, based on a modified version of the World Bank's training and visitation extension model. This project provides the resources necessary for expanding the coverage of this effort through training, operational support for the extension services, and production of extension materials. A continuing focus of this effort and project will be on improved maize production.

(See Vol. 3: Arusha Rural Productivity Project, Part V, Section 3)).

Irrigation Development

38,800,000 T.Shs.

The need and potential for irrigated crop production in Arusha Region are substantial if food crop supplies are to be maintained and increased. This project is designed to develop regional and district capabilities to design and implement irrigation projects, rehabilitate existing irrigation systems, develop schemes in areas where there are traditional irrigation schemes or where natural water flows allow low-cost construction, and prepare the feasibility studies for larger scale schemes to be financed under the long-term plan. This project may be divided into several sub-projects for specific locations in the agricultural and Maasai Districts.

(See Vol. 3: Arusha Rural Productivity Project, Part V, Section 4)).

Agricultural Workshop and Farm Service Centers (Pl.1)

17,700,000 T.Shs.

This project is designed to establish a series of seventeen farm centers or workshops in important agricultural areas. These centers will provide maintenance and spare parts for agricultural equipment (ox-drawn and tractor depending on areas), other agricultural inputs, warehouse and storage facilities, and locations for extension services. Priority for establishing these centers will begin with highly productive areas such as Karatu and be gradually expanded as the idea is tested and as resources become available.

(See Vol. 3: Five Year Development Plan, Part II, Section 2.17[5])).

1.3 Priority Long-Term Plan Projects

Over the long-term, the Region proposes major investments in irrigated agricultural production to achieve necessary production increases on a sustainable basis. Priority projects include:

Pl.2 Kiru Valley Irrigation and Agricultural Development

278,000,000 T.Shs.

This project is designed to develop the Kiru Valley in Hanang District. The project, based on a pilot irrigation scheme, will extend and improve irrigated production in village areas, control flooding, rehabilitate estate and leasehold farms in the upper reaches of the valley, and will include reclamation of swamp land. It is anticipated that about 28,000

hectares can be improved with a reliable water supply for irrigation. Also, under the project, improved agricultural technology and soil conservation practices will be introduced.

- Pl.3 Mang'ola Irrigation/Flood Control and Agricultural Development 240,000,000 T.Shs.

This project is designed to develop the substantial irrigation potential of the Mang'ola and Yaeda Valley. It is designed to place about 20,000 hectares under irrigated production, with the establishment of flood control and improved land management and soil conservation. In addition, the project will introduce improved agricultural and livestock production methods.

- Pl.4 Mbuguni-Moshono Irrigation and Flood Control Project 35,000,000 T.Shs.

This project is designed to bring 3,500 hectares under irrigated production in the Mbuguni-Moshono area of Arumeru District. It will construct the necessary irrigation infrastructure to tap water from the Kikuletwa and Nduruma Rivers. In addition, it will initiate several flood control measures including the construction of earthen embankments and protection works along the rivers and installation of control gates and storage facilities. Further, the project will introduce agricultural and soil conservation methods.

- Pl.5 Lake Babati Irrigation and Flood Control Project 6,000,000 T.Shs.

This project is designed to control the serious flooding of Lake Babati and in the process develop 500 hectares of irrigated production. This area is appropriate for paddy rice production and a main concentration of the project will be introducing this technology as well as conservation measures.

The above projects will extend irrigated agricultural production in the Region by 52,000 hectares. With improved agricultural and soil conservation measures, they offer the potential for a sustainable food supply for the Region to meet the needs of its growing population and to continue to provide a surplus for national consumption.

1.4 Project Ideas to be Developed

In addition to the above irrigation projects, there are the potentials for expanded irrigated production in Dongobesh in Mbulu District, for the development of the catchment area of the Bubu River in Hanang District, and for the expansion of small scale irrigation activities now being carried out in the three Maasai Districts. Other project ideas for external development and funding include:

- The establishment of an arid lands testing center for the further introduction of drought resistant crops primarily in the three Maasai districts;
- The revitalization of the agricultural marketing system with an aim to establish village cooperatives for input delivery, marketing and sale of consumer goods;
- A market analysis for spice exports and the development of projects similar to those in the Sudan for spice production and marketing to private companies;
- The further exploitation of the potential for wheat production in Ngorongoro District (with anticipated funding from Canadian assistance through NAFCO); and
- The development of integrated production and processing projects for fruits and vegetables.

Long Term Investment Proposal - Agriculture

P. 1.1

I. Project Title: Agricultural Workshop and Farm Service Centers

II. Project Objectives:

To support mechanized agricultural production in Arusha Region through the development of a Regional Agricultural Workshop (in Karatu, Mbulu District) which will:

- Provide spare parts and maintenance services for tractors, combine harvesters, and other agricultural implements;
- Provide hiring services for tractors and combine harvesters owned by the government; and
- Serve as a maintenance training center.

To support both food and cash crop production in Arusha Region through the development of Farm Service Centers in agriculturally productive areas in the six rural districts. The Farm Service Centers will:

- Provide maintenance and repair services for tractors, combine harvesters, ox-carts, ox-ploughs, and other agricultural implements;
- Improve the distribution of agricultural inputs such as seeds, fertilizers, insecticides, and petrol/ diesel; and
- Serve as the focal point for agricultural extension services.

III. Project Location:

The regional Agricultural Workshop will be located in Karatu, Mbulu District.

Seventeen Farm Service Centers will be located in agriculturally productive areas in the six rural districts: Arumeru, Hanang, Mbulu, Monduli, Kiteto and Ngorongoro.

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IV. Estimated Cost: 17,700,000 T.Shs.

V. Background and Rationale:

As one of the leading agricultural regions in Tanzania, Arusha Region has a long history of agro-mechanization. However, during the Third Five Year Plan it became increasingly apparent that the poor condition of the agricultural machinery has hindered agricultural productivity. In strengthening the agricultural sector the region has therefore adopted a strategy of maintaining the existing capital in agricultural equipment and developing the production, maintenance, and utilization of intermediate, light-weight agricultural equipment and ox-drawn implements.

As of 1981, it is estimated that there were 1,568 tractors in Arusha Region, 500 of which were completely broken down. An additional 200 needed spare parts in order to be rehabilitated. There were also 61 combine harvesters, 11 of which were completely broken down, and 30 of which needed spare parts in order to be rehabilitated. At the same time it is estimated that there are approximately 3,900 ox-carts in the region, while the need for ox-carts is estimated to be at least 8,500. There are approximately 36,000 ox-ploughs, 9,000 of which are no longer servicable, and there is a very serious shortage of plough shares and other spares.

During the Third Five Year Plan, an agro-mechanization center was started in Arusha Region with the aim of providing two services: (a) maintenance and repair of government-owned, cooperative, or individually owned agricultural machinery (tractors and combine harvesters), and (b) tractor hire services. Funds allocated and used for this project during the Third Five Year Plan were as follows:

	<u>1977/78</u>	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>
Allocated	200,000/-	605,000/-	355,000/-	1,780,000/-
Spent	235,000/-	581,968/70	353,376/65	1,645,469/45

The project concentrated in three areas: Karatu Division of Mbuly District, Hanang District and Arumeru District. Six tractors, four disc plough, three harrows, one chisel plough and one rotavator were purchases bringing the total number of tractors under the project to 12.

The 1982/83 Development Budget includes an allocation of 570,000/- for this project, to be spent as follows:

Agricultural Workshop, Karatu	
Building materials	300,000/-
Spare parts for tractors and combine harvesters	200,000/-
Transport materials	50,000/-
	<hr/>
TOTAL	550,000/-

In addition, 100,000/- has been budgeted under APVDP to begin development of a Farm Service Center in Arumeru District which will provide services for the distribution of agricultural inputs such as seeds, fertilizer, insecticides, diesel/petrol, hoes, plough-shares, ox-carts, and other agricultural equipment.

The Agricultural Workshop and Farm Service Centers are aimed at improving the operation of the present stock of farm machinery in the region and improving the distribution of agricultural inputs to contribute to the goals of a 3 percent annual increase in production of cash crops and a 4.8 percent annual increase in food crops.

IV. Detailed Project Description

The Project will consist of two components:

- Completion of a Regional Agricultural Workshop in Karatu. This workshop will provide the following services:
 - Repair and maintenance facilities for government, cooperative, and individually owned agricultural machinery.
 - Distribution of spare parts for machinery and other agricultural inputs.
 - Training on maintenance and repairs to agricultural machinery.
- Development of Farm Service Centers in the agriculturally productive areas of the six rural districts. These centers will:
 - Provide maintenance and repair services for tractors, combine harvesters, ox-carts, ox-ploughs, and other agricultural implements.

- Serve as the focal point for agricultural extension services.

VII. Cross-sectoral Coordination:

As centers for extension services and distribution of agricultural inputs, these centers will serve as focal points for providing similar services in the other productive sectors as well, leading to an integration of the extension activities.

VIII. Existing Project Preparation Documentation:

No detailed plans for the construction or operation of either the Agricultural Workshop or the Farm Service Centers have been prepared. Short descriptions of the project are found in the Fourth Five Year Development Plan 1981/82 - 1985/86 and in the 1982/83 Annual Development Plan for Arusha Region.

IX. Action Required:

Development of detailed implementation plans and organizational arrangements for both the Agricultural Workshop and the Farm Service Centers. Site plans and construction plans are also required.

Long Term Investment Proposals - Agriculture

P. 1.2

I. Project Title: Kiru Valley Irrigation and Agriculture Development

II. Project Objectives:

To develop a multipurpose land management scheme for the Kiru Valley area of Hanang District, designed to:

- Extend and improve irrigated agriculture in the village areas;
- Rehabilitate agricultural production on the estate and leasehold farms in the upper reaches of the valley;
- Prevent flooding of land which was previously under production through rehabilitation of existing furrows; and
- Extend the area area of land currently available for agricultural and livestock production through reclamation of swamp land in the northern part of the area.

Though the above, to contribute to the achievement of necessary long term gains in the production of food crops for both the Arusha Region and national distribution, and to contribute to the rehabilitation and expansion of cash crop production for export sales.

III. Project Location:

Kiru Valley is located south-west of Magugu Village in Hanang District. Magugu is approximately 90 miles south-west of Arusha on the Great North Road linking Arusha and Dodoma. The District headquarters, Babati, is 15 miles south of Magugu.

The western boundary of the potential development is the Rift Valley escarpment and the hills east of Derakuta and the Gichami River Valley, with the eastern boundary formed by the Arusha-Dodoma Road.

IV. Estimated Cost: 278,000,000 T.Shs.

A number of options for potential levels of development investment are indicated in the detailed project description.

V. Background and Rationale:

The feasibility study for Irrigation and Agricultural Development in Kiru Valley was undertaken in response to the national priority on extension of irrigated agriculture. Potential for irrigation development in Kiru Valley is indicated on several grounds.

First, there is adequate land to support a medium- to large-scale irrigation scheme and historical evidence indicates that a potential exists for a wide variety of crops to be grown under irrigation in the area.

A number of crops are irrigated at the present time by both small- and large-scale farmers. Therefore, some familiarity with the principles of irrigated agriculture.

Several perennial rivers flow through the Kiru Valley providing a permanent source of irrigation water. Preliminary hydrolic investigations show that there is an adequate supply for a large-scale scheme, and there are no visible indications, such as formation of salt patches on irrigated soils, to suggest that irrigation water is of low quality.

Disruption of the local populace to establish the scheme would be minimal in view of the distribution of population in relation to the various categories of land tenure.

There is already a solid basis for estate-type agriculture centered on the leasehold land, much of which is abandoned or inefficiently operated at the present time, with adjacent areas farmed both communally and individually on village lands. The land tenure system and associated population distribution patterns, therefore, lend themselves to a single large-scale operation with a series of associated out-growers operating on a contractual basis with the centrally controlled scheme.

Production potential from this area is considerably under-exploited, partly due to changes in the tenure of leasehold land and partly to the relative levels of farm husbandry on the village lands. The area has potential for increased production of import substitutes and export crops, as well as providing crop residues and by-products to support improved livestock programs and agro-industry.

The physical nature of the area, in its land tenure systems and its proximity to a potential source of hydro-electric power (Hainu), provides scope for phased development of a larger scheme. This could facilitate financing and implementation, and allow Tanzanian expertise to be built up in the early phases to facilitate later stages of

development and to generate a capacity for establishing future schemes in other locations.

VI. Detailed Project Description:

A series of phased options have been investigated for the development of the irrigation and agricultural potentials of the Kiru Valley area. These phases and their objectives are outlined as follows:

Phase 1: Concentrate on the flood control issue.

Objective: To prevent flooding of land which was previously productive (and which is now inundated following faulty weir construction) and hence activate two existing furrows.

Phase 2: The incorporation of modifications to water use from existing furrows.

Objective: Rationalize water application on the basis of user and crop requirements.

Phase 3: The preparation of a soil survey to develop a land use/land management plan to maximize productivity on the basis of an accurate assessment of soil/crop/water relationships.

Objective: To maximize productivity of the total area irrigable from the existing two furrows.

Phase 4: Rehabilitation of farming on currently grossly unproductive leasehold land.

Objective: Maximize utilization of leasehold land.

Phase 5: Large-scale centrally controlled unit supported by outgrowers (both large- and small-scale; i.e., existing private leases, village land, and individual dual ploholders) based on irrigation from the Dudumera catchment.

Objective: To maximize productivity of currently unproductive leasehold and village land and develop a scheme in which economies of scale would allow incorporation of major irrigation works and a vertically integrated production unit - from crop production to product marketing and distribution.

Phase 6: Building on Phase Five, but incorporating investigation of possibilities for reclamation of swamp land.

Objective: To develop a multi-purpose scheme based on existing farmland in Kiru Valley, and the possibility of increasing the land available for crop/livestock production by draining swamp areas to the north of Magugu.

Areas involved in the six phases:

Whole area demarcated by the preliminary study	730 sq. km.
Attention to flood control and irrigation from two furrows	50 sq. km.
Total leasehold land	400 sq. km.
Swamp area within the preliminary study area	20 sq. km.
Swamp area to the north of the investigation area	120 sq. km.
Area west of the main road below 4000 ft. contour	300 sq. km.
Areas east of main road below 4000 ft. contour	70 sq. km.

VII. Cross-sectoral Coordination

Irrigation and agricultural development of the Kiru Valley will contribute substantially both to long-term increases in food supplies and to increase in export crop production. Reclamation of inundated land and swamp reclamation will extend areas available for livestock production. In addition, both the food crops and export crops will provide crop residues and by-products to support improved livestock programs, and will contribute essential raw materials for agro-industry. Kiru Valley is also ideally located to take advantage of the hydro-electric power potential of the Hainu River Project.

VIII. Existing Project Preparation Documentation:

A Preliminary Investigation into the Potential for Agricultural Production from the Kiru Valley Area of Hanang District, I.C. Walton, J. Gadek, and D.R.R. Mabugo, June 1981.

IX. Action Required:

A firm commitment on the part of the Government on the organizational framework within which the irrigation scheme can be developed, bearing in mind the various land tenure systems in operation and the need for coordination of farming practices, and adherence to an overall management plan.

Agreement on the objectives of the scheme which the feasibility study team will use as guidelines.

An assessment of the current state of leasehold land tenure in the investigation area.

Early establishment of water quality testing at selected points along potential irrigation water sources in the valley.

Collection of available water flow data and generation of daily discharge data for the Dudumera River.

Collation of available meteorological data for Kogugu.

Full feasibility study, including soils' specialist, water control specialist, crop production specialist, and agricultural economic/financial evaluation specialist.

Long Term Investment Proposal - Agriculture

P. 1.3

I. Project Title: Mang'ola Irrigation/Flood Control and Agricultural Development

II. Project Objectives

To develop the substantial irrigation potential of the Mang'ola area to contribute to the necessary long term gains in food supplies that will be required to feed the growing population of Arusha Region and to generate a surplus for national distribution.

To reclaim additional area for irrigation, and through control of groundwater discharge for irrigation to control the annual flooding of large areas of agricultural land adjacent to the rivers.

To develop a sound land use management and soil conservation program for the Mang'ola area and to develop marketing arrangements for the sale of the agricultural produce.

III. Project Location:

Mang'ola area is situated at the northeast end of Lake Eyasi in Mbulu District at an altitude of about 3,500 ft. above sea level. The area is approximately 210 kilometers west of Arusha. The potential area for irrigated agriculture includes 20,000 hectares.

IV. Estimated Cost: 240,000,000 T.Shs.

V. Background and Rationale:

The Mang'ola area is characterized by highly permeable soils and substantial groundwater that is recharged annually by rainfall. The groundwater is a natural, low-cost source of irrigation water and a phased development of irrigated land can eventually be expanded to over 20,000 hectares by the construction of appropriately spaced groundwater interceptors.

There are two rivers in the area, the perennial Mang'ola and the intermittent Barai. The Mang'ola River is a natural groundwater interceptor. The Earth Satellite Corporation (1975) concluded that the land system in the area consists of intersecting fractures leading westward

from the Kidero Mountains. The entire area should be studied in detail to determine how to construct groundwater interceptors at proper locations and to adjust the present Mang'ola River interceptor.

When these interceptors are appropriately located, the natural flow can continue and be used for extensive irrigation development. The area has outstanding irrigated agricultural potential and, if the project is designed properly, it will provide good flood control for the large areas adjacent to the rivers which are flooded annually during the rainy season. This flood control will also contribute to soil conservation and the reclamation of swampy areas adjacent to Lake Eyasi for extension of the irrigated area.

Mang'ola area is currently the site of some limited irrigation producing onions and other crops. A 1977 feasibility study by the Ministry of Agriculture estimated a potential net annual agricultural production of T.Shs. 37,000,000 which could be considerably greater at current prices. Infrastructure to support the project has recently been improved through the rehabilitation of the Oldeani-Mang'ola road by APDVP.

Detailed land use surveys of 17,000 hectares have been carried out by the Arusha Land Use Planning team, and limited soil surveys have been made. With reclamation of adjacent swampy areas near Lake Eyasi, the projected irrigated area could cover more than 20,000 hectares.

In addition to the components of flood-absorption, irrigation, soil conservation and afforestation, reclamation of land for irrigation, and development of marketing facilities, adjacent area in the Lake Eyasi Basin including the Yaeda Valley can be developed for livestock production and wildlife utilization.

VI. Detailed Project Description:

Irrigation/Flood Control and agricultural development of 20,000 hectares in the Mang'ola Area of Mbulu District.

Following basic hydrological, land survey, soil survey, water level and rainfall studies, a phased development of the irrigation potential to be undertaken.

A Pilot area on the Mang'ola River is currently being considered for rehabilitation by the villagers. Second phase construction of a weir across the river would increase the waterhead to feed an existing irrigation

furrow located on relatively higher ground. Phased development of 500 hectare units would be accomplished by development of groundwater interceptors fed by the enormous artesian water system.

Additional components to include:

- Reclamation of swampland adjacent to Lake Eyasi;
- Development of a soil conservation/afforestation program; and
- Development of marketing arrangements for agricultural produce.

VII. Cross-sectoral Coordination:

Development of infrastructure/marketing arrangements for the agricultural development of the Mang'ola area would also contribute to development of livestock production and wildlife utilization in adjacent areas in the Lake Eyasi Basin, including the Yaeda Valley.

VIII. Existing Project Preparation Documentation:

Mang'ola Flood Control Cum Irrigation and Power Project, Feasibility Report, Regional Irrigation Unit, Ministry of Agriculture, S.L. Khullar and K. Singh, 1977.

Developing Irrigation in Arusha Region, Dr. Bishay G. Bishay, May 1982.

Potential Groundwater and Land Resource analysis for Planning and Development, Arusha Region, United Republic of Tanzania. Report prepared for the U. S. Agency for International Development, Washington, D.C., Earth Satellite Corporation, 1975.

IX. Action Required:

The following basic studies are needed:

- Hydrological study: To supply information generally concerned with an aquifer such as geometry of the reservoir, lithology, geological cross section, transmissivity, diffusivity, water balance (recharge and discharge), safe yields, and optimum design of irrigation interceptors.
- Land survey: Topographic maps at 1:5,000 and 1:5,000 needed for detailed project design.

- Soil survey: A reconnaissance or semi-detailed survey is required for the feasibility study and a detailed soil survey is required for project design.
- Water level survey: To determine fluctuation in level of Lake Eyasi.
- Rainfall: Collation of available meteorological data and early establishment of water flow and water quality testing points.

A full feasibility study, to include a soils specialist, water control specialist, crop production specialist, and an agricultural economist/financial evaluation specialist.

Long Term Investment Proposal - Agriculture

P. 1.4

I. Project Title: Mbuguni-Moshono Irrigation and Flood Control Project

II. Project Objectives:

To develop the substantial irrigation potential in the Mbuguni-Moshono area of Arumeru District to contribute to the achievement of long term gains in food crop production that will be required to feed the growing population of Arusha Region and to generate a surplus for national distribution.

III. Project Location:

Mbuguni-Moshono area is situated at a distance of about 48 km. south-east of Arusha Town. Kikuletwa and Nduruma are the main rivers in the area and the potential area for irrigated agriculture includes an area of 3,500 hectares.

IV. Estimated Cost: T.Shs. 35,000,000

V. Background and Rationale:

Mbuguni-Moshono area in Arumeru District is an area of high agricultural potential with an estimated irrigable area of 3,500 hectares. Although there are three perennial rivers and several seasonal rivers, only about half of this area is reported to be irrigated as much as once a year by traditional furrows.

The main rivers which, with their tributaries, originate from the Meru Forest Reserve, are the Nduruma, the Kikuletwa and the Themis with catchment areas of 60 sq. miles, 150 sq. miles, and 35 sq. miles, respectively. Two major seasonal rivers are the Mungushi and Oloibor. Altogether there are an estimated 215 traditional furrows, irrigating about half of the 3,500 hectares.

Being situated on the lower plains of Arumeru District, most of Mbuguni is cultivated in the rainy season, with the main crop being maize. Lack of water control facilities causes inundation of much of the land during rainy season, and in several cases emergency task forces have had to be set up to provide emergency assistance to farmers and livestock. In the dry season, lack of adequate water storage facilities leads to a serious paucity of water and thus a serious underutilization of the irrigation potential.

VI. Detailed Project Description:

Irrigation works will include:

- Construction of pick-up weirs/intakes on selected furrows on the Kikuletwa and Nduruma Rivers;
- Remodeling of existing furrows, construction of new furrows, and lining of selected furrows to reduce seepage;
- Construction of small storage reservoirs;
- Construction of cross-drainage works;
- Installation of appropriate water-lifting equipment (e.g. Persian wheels); and
- Damming of the Oloibor Senya seasonal river and construction of link channels between the Oloibor Senya, Themis and Nduruma rivers.

Flood control works will include:

- Construction of earthen embankments and protection works along selected stretches of the Kikuletwa and Nduruma Rivers;
- Installation of control gates on most of the traditional irrigation furrows to prevent unregulated flows during the rainy season;
- Construction of small storage reservoirs on the Kikuletwa, Nduruma and Mungushi Rivers and their tributaries; and
- Plans for the utilization of Lake Duluti as a storage reservoir through the diversion of several streams.

VII. Cross-sectoral Coordination:

In addition to increasing food crop production, the expanded irrigation will provide crop residues and by-products to support improved livestock programs, and will contribute essential raw materials for agro-industry.

VIII. Existing Project Preparation Documentation:

Mbuguni-Moshono Irrigation Cum Flood Control Scheme Preliminary Report, No. R.I.V. 78. Regional Irrigation Unit, Ministry of Agriculture, K. Singh, 1978.

IX. Action Required:

Detailed basic studies are needed, including geological investigations, hydrological study, land surveys and mapping soils survey and mapping, water flow and rainfall data collection water quality testing points, and a full feasibility study.

Long Term Investment Proposal - Agriculture

P. 1.5

- I. Project Title: Lake Babati Irrigation and Flood Control Project
- II. Project Objectives:
- To contribute to increased food crop production through the development of irrigation potential around Lake Babati in Hanang District.
- Prevention of floods and consequent flood damage to Babati Township, headquarters of Hanang District.
- III. Project Location:
- Babati Township is situated adjacent to Lake Babati along the Arusha-Dodoma Road about 180 km south-west of Arusha in Hanang District.
- The area surrounding Lake Babati with potential for irrigation includes approximately 500 hectares.
- IV. Estimated Cost:
- | | |
|--------------------|------------------|
| Feasibility Study: | T.Shs. 100,000 |
| Project: | T.Shs. 6,000,000 |
- V. Background and Rationale:
- Babati Township is situated immediately adjacent to Lake Babati in Hanang District. During the rainy season the run-off from a catchment area of about 320 square kilometers drains into Lake Babati. The banks of the land adjacent to Babati Town, especially along the Babati-Dodoma Road, are low with subsequent overflow into Babati Town before the water drains into a seasonal stream which drains into the Dudumera River.
- An estimated 500 hectares of land adjacent to Lake Babati could be put under paddy (rice) production through the construction of flood control works.
- VI. Detailed Project Description:
- Two alternatives for the irrigation and flood control project have been proposed. The detailed feasibility study would assess the two proposals.

Alternative I involves construction of a storage dam about 6 meters in height between the Ayaawek and Sumbi hills. This storage dam would affect about half of the catchment area, i.e., an area of about 160 square kilometers. Additional construction would include irrigation channels and structures.

Alternative II involves construction of earthen embankments for Lake Babati along selected stretches of the Babati-Dodoma and Babati-Singida roads, where the river banks are low. The feasibility study would consider suitable building materials for the embankments as well as their design. This alternative would involve the construction of a side-channel spillway to discharge into the overflow stream (Thlawi Gulley), leading to the Dudumera River. It would also involve construction of an intake structure in the lake and an underground pipeline connected to the overflow gulley for releasing regulated water supplies for irrigation, as well as additional irrigation channels and structures. This alternative would involve construction of a culvert across the Babati-Dodoma Road as a spillway channel.

VII. Cross-sectoral Coordination:

In addition to providing increased food crop production, the proposed project is essential for maintenance of the road links and other economic infrastructure in Babati Town.

VIII. Existing Project Preparation Documentaton:

Lake Babati Flood Control Cum Irrigation Scheme, Preliminary Report, Regional Irrigation Unit, Ministry of Agriculture, Arusha.

IX. Action Required:

Full feasibility Study and implementation plan.

II. OBJECTIVE TWO: DEVELOPING THE LIVESTOCK INDUSTRY

The second investment objective of the Region is to develop the livestock industry for the purposes of local and national consumption and for export. The current livestock industry is traditionally-oriented, with most livestock held for family consumption and wealth.

2.1 Analysis of the Objective

Livestock production (along with agriculture) is one of the two main enterprises of people in Arusha Region. It is a main source of food, wealth and employment in many rural areas. Recent land use surveys indicate that over 6 million hectares or about 80 percent of the land area of the Region is available for livestock grazing. Much of this land cannot be used because of tsetse infestation, lack of water, and soil deterioration; more accurately about 60 percent of the Region's land area is used for grazing. The value of the grazing land varies greatly from district to district. In the agricultural districts of Arumeru, Hanang, and Mbulu, grazing is confined to steep slopes and less fertile and eroded areas unsuitable for crops. In the three Maasai districts of Monduli, Kiteto and Ngorongoro, livestock grazing is extensive with animals going wherever forage and water are available.

There are nearly 2.2 million cattle, 1.1 million sheep, and 1.5 million goats of indigenous breeds in the Region. With such a high level of production, human protein requirements can be met. However there are no reliable figures on offtake and on where that offtake is marketed. The evolving dairy industry has the potential to meet milk and dairy product demands in the Region, but only 25 percent of the supply necessary for the Tanzanian Dairy Corporation is being provided with the remaining 75 percent

available through food imports. There is small ruminant production, but on a small scale, falling far below the requirements and potentials of the Region.

There are several trends in the Region which influence current livestock production and call for modifications in traditional livestock management practices. With the growing population of Arusha Region, competition for land is increasing. There has been a reduction of grazing land due to agricultural expansion; moreover, there has been extensive range deterioration (with the replacement of good quality forage with undesirable plant species) and significant soil erosion by wind and water because of overgrazing, cattle tracking and concentration of animals at water places. As forage and water supplies diminish, there is also increasing competition for resources between wildlife and livestock. These trends suggest the need for better land and water resources management and conservation at the village level as well as the gradual modernization of the livestock industry.

The Region, assisted by the National Livestock Development Policy 1981, has taken steps to improve the stability and productivity of the livestock sector. A major focus has been to improve village land use planning and management through such projects as the Kisongo Water Catchment Development Program in Arumeru District. Further efforts have been made to improve extension services, livestock infrastructure, and the availability of veterinary supplies. However, there are major constraints to be addressed in the longer-term plans of the Region. In the traditional rangelands of the Region, the major concerns of the pastoralists are; security of land tenure to reduce further encroachment by agriculturalists, provision and maintenance of adequate water supplies, and the availability of veterinary medicines and services. In the more highly populated areas, where mixed crop and livestock production systems are in use, the primary needs are for extension information on improved production

technologies and the availability of services and inputs to intensify livestock production.

2.2 The Medium (Five Year) Plan

The Region's medium term plan allocates a major portion of resource investments to the livestock sector. Of particular importance during this five year period will be the continued development of the livestock sector infrastructure.

The plan proposes several projects for adaptive research including the testing of forage crops and the further investigation of possible water supplies for the livestock industry. In the Maasai districts, approaches to better range management and to the establishment of village ranches and cooperative pastures will be tested. In the districts with mixed farming systems, approaches to intensive livestock production will continue to be tested.

Directly related to the research and testing, the plan calls for the further development of livestock centers and the strengthening of extension operations through the provision of training, better facilities, equipment and supplies. Training will concentrate on improved land and water resource use and management and the introduction of more modern animal husbandry methods. With this intensification of training, one project proposes to expand the facilities and other capabilities of the Monduli Livestock Development Training Center.

A main constraint addressed by the medium-term plan is the further development of water supplies for livestock production. This includes projects for dam rehabilitation and construction and borehole rehabilitation and development. Closely linked to water resources development will be the construction and rehabilitation of cattle dips to increase geographic coverage. Several projects

have been proposed to provide the Region with an ongoing capability to improve the livestock sector infrastructure, primarily related to water resources utilization, which involve equipping and upgrading the Maasai Range Workshop, the establishment of a range workshop in Ngorongoro District, and the creation of Maasai construction brigades to do contract work on infrastructure development.

Other projects under the medium-term plan continue to develop ongoing programs of the Region, including tsetse fly eradication, the provision of curative and preventive veterinary medicine, the establishment of breeding centers and slaughter facilities, and the expansion of the Region's dairy herd. Funds are also allocated to expand fisheries activities in the Region and to promote beekeeping through the introduction of modern hives.

Priority projects requiring external funding include:

Extension Training and Operations 16,400,000 T.Shs.

This project consists of several activities (included under the Medium-Term Plan) to improve the overall performance of the Livestock Development Extension Service. Of particular importance is the ongoing training of veterinary field staff and livestock keepers, with the expansion of the Monduli Livestock Training Center as a focal point of this training.

Further the project provides for vehicles and equipment, field housing, and a small expansion of the Regional Veterinary Office.

(See Vol. 3: Five Year Development Plan, Part II, Section 2.6).

Veterinary Medicines 3,500,000 T.Shs.

The purpose of this project is to provide preventive and curative veterinary medicines for livestock keepers. The medicine will be sold, creating a fund for continued purchase of needed supplies.

(See Vol. 3: Five Year Development Plan, Part II, Section 2.6 (10)).

Range Workshops

8,200,000 T.Shs.

The aim of this project is to upgrade the capabilities of the Maasai range workshop and to establish a workshop in Ngorongoro District. Both of these workshops will service machinery for water resource and other livestock infrastructure development. For the Maasai workshop, the project provides the acquisition of four bulldozers and spares.

(See Vol. 3: Five Year Development Plan, part II, Section 2.6 (18, 19)).

Maasai Construction Brigades

11,000,000 T.Shs.

This project is designed to establish construction brigades in Kiteto, Monduli, and Ngorongoro Districts to do contract work for Maasai villages to develop their livestock and other infrastructure. Regional research shows that Maasai villages are willing to finance (rather than contribute labor) village improvements; such investments may increase livestock sales to pay for these services.

(See Vol. 3: Arusha Rural Productivity Project, Part V, Section 5.5.4).

Water Resources Development

8,400,000 T.Shs.

The project provides for the further development of water supplies for livestock primarily in the Maasai districts. Project components include the construction and rehabilitation of 30 dams, the digging of four boreholes, and the purchase of pipe to connect cattle dips with available water. (See Vol. 3: Five Year Development Plan, Part II, Section 2.6 (2,3)).

Tsetse Fly Eradication

5,000,000 T.Shs.

This project supports the ongoing efforts of the Region to clear tsetse fly infested areas which will open up significant lands for grazing. The project provides for equipment and materials to be procured externally.

(See Vol. 3: Five Year Development Plan, Part II, Section 2.6 (9)).

2.3 Priority Long-Term Plan Projects

Project proposals for the long-term plan of Arusha Region call for major development of the beef and dairy industries, based on improved land use planning. It also calls for a major investment in the small ruminant industry--production and

processing--which reflects a potential of the Region that has not yet been developed. Summaries of these proposals follow with full descriptions in the attached annex.

P2.1 Regional Range and Dairy Development Program

53,800,000 T.Shs.

The project has been developed in response to the national government's request for the development of a livestock development policy. The project concentrates on establishing land use priorities for the six districts, with an aim of introducing modern methods of production to improve beef and dairy production. Institutionally, it further develops concepts of village ranches, national and regional ranches, and individual farms. Though fully integrated, the project has several components which can be broken out for specific financing:

- Surveying and Plans (1.1 Million T.Shs.).

The component provides for the necessary survey and planning work to establish 43 ranches, 47 dams, and 19 boreholes.

- Piped Water Systems for Group Ranches and Dips (4.1 million T.Shs.).

This component provides for the development of piped water systems for livestock consumption and for the establishment of dips on the 43 ranches.

- Construction of Dams (15.5 million T.Shs.)

This component provides for the construction of 47 dams to provide water resources for consumption and dips.

- Construction of boreholes (9.0 million T.Shs.).

This component provides for the digging and installation of boreholes in areas where surface water is not available. It includes 19 boreholes and headworks.

- Construction of Worker's Quarters (5.7 million T.Shs.)

In support of the new ranching operations, there is a need for quarters for 38 livestock development workers which is provided by this project component.

- Construction of Dips (2.6 million T.Shs.)

This project component provides for the construction of 37 dips to serve the requirements of the new and improved ranch operations.

- Construction of Calf-Pens and Milking Sheds (2.4 million T.Shs.)

For the projected 30 dairy farms, this project component provides for the construction of calf-pens and milking sheds.

- Vehicles and Equipment (3.0 million T.Shs.)

This project component provides for the necessary vehicles and farm equipment for the Livestock Service to support overall project operations.

- Tsetse Clearing and Control (10.4 million T.Shs.)

This project component opens up new land for the ranching operations, including 5,000 hectares through clearing and 90,000 hectares through spraying.

The above summary outlines the investments required for the regional program. Area specific investments are also possible in lieu of general program support.

P2.2 Arusha Agro-Industrial Project 371,200,000 T.Shs.

This project was developed by the OCM SACCO Consortium of Italy in cooperation with SHUMA the Arusha District Development Corporation. Based on successful models (such as the one in Zaire), this project involves the development of the pig and poultry industry of Arusha Region for both domestic consumption and export markets. The project develops a potential of the Region that has not yet been realized and includes:

- The establishment of farms to produce cereal and protein for animal feed;
- The establishment of a feed production center that premixes feed and protein concentrates;
- The establishment of a hatchery which produces chicks for domestic and export sales and also poultry meat;

- The development of a swine breeding center for sale of piglets and production of pork;
- The establishment of a slaughterhouse for pigs (61,000 head per year) and poultry (2.4 million head per year);
- The development of a waste treatment and fertilizer production plant for preparation of organic and inorganic substances; and
- The construction of the infrastructure in support of the above operations.

The project is a high technology, fully integrated effort which uses the resources of the Region. Its long-term success depends on the availability and access to export markets which is currently being examined by FAO. However, even for domestic purposes, aspects of the project have significant merit and potential benefits which can be examined on a reduced scale (and with a village orientation) if major funding is not available.

2.4 Project Ideas to be Developed

In addition to the projects highlighted under the medium-and long-term plans, there are several project ideas to be developed over the next two decades which will support the current and future regional initiatives.

Animal Drug and Vaccine Production Facility

One major constraint to the development of the beef and dairy production industries in Arusha Region is the availability of curative and preventive veterinary medicines. Because of its importance as a livestock production center, Arusha would be an appropriate location for the construction and development of a production facility.

Livestock Marketing

Currently most livestock products are held for wealth or consumed locally, due in part to poor prices, and inadequate livestock marketing infrastructure, and the lack of desired

consumer goods. The offtake from the cattle herds can be increased through a marketing project that combines the provision for purchase of veterinary supplies and consumer goods with improvements in livestock marketing facilities. The services provided for livestock, i.e., veterinary drugs, acaricides, construction and running of cattle dips, and livestock water development, will be paid for by the users of those services. This project is of critical importance for national and export market supply and development.

Abattoir--Arusha Region

If market surveys are favourable for the development of an international market for the Region's beef cattle there will be a need for a project to construct and initially support the operations of an Arusha-based abattoir.

Development of the Dairy Industry

Under the plans outlined above, the initial objective of the Region is to expand milk production through the establishment of dairy farms and improved individual farm production. This will increase supply and make more production available to the Tanzanian Dairy Corporation. When this occurs, there will be a need for establishing a village network of cooling and storage facilities as well as the establishment of processing facilities in key geographic areas where milk production is high.

Water Supply and Livestock Development

The long-term plan outlines several projects for the development of water resources and for directly productive activities. Therefore, as these water supply projects are improved, there is a need for complementary projects to improve beef and dairy production. These should include livestock development plans for the following areas:

- Central Kiteto area;
- Dangobesh area;
- Mto wa Mbu-Mbuyuni area;
- Kiru Valley; and
- Mang'ola - Yaeda Valley.

Long-Term Investment Proposal - Livestock

P. 2.1

I. Project Title: Regional Range and Dairy Development Program

II. Project Objectives:

To develop a land use plan for the range resources of Arusha Region to ensure adequate grazing for the region's Livestock.

To establish land use planning priorities for each of the districts of the Region according to their agro-ecological potentials.

To develop the livestock industry of Arusha Region through Village Group Ranches, small village ranches, ranching by national and regional institutions and individual livestock keeping, through the provision of the essential services required for a modern livestock industry.

To develop the dairy industry in Arusha Region through village and individual dairy projects and the provision of essential services and extension support.

III. Project Location:

The Regional Range and Dairy Development Program will cover all six rural districts and Arusha Urban District, with the following land use planning priorities:

- Monduli District -- Beef Cattle Ranching
- Kiteto District -- Beef Cattle Ranching
- Ngorongoro District -- Beef Cattle Ranching
- Mbulu District -- Mixed Livestock/Agriculture
- Hanang District -- Mixed Livestock/Agriculture
- Arumeru District -- Dairy Farming/Agriculture
- Arusha Urban District -- Dairy Farming/Agriculture

IV. Estimated Cost: T.Shs. 53,800,000.0 over ten years, 1982/83
- 1991/92

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V. Background and Rationale:

With over 80% of its land area suitable as rangeland, Arusha Region is one of the leading livestock regions in Tanzania. However, livestock production is very low for a variety of reasons and for the livestock industry and the dairy industry to be developed there is a need to establish efficient organizational structures and to provide essential services for the industry. Between 1970 and 1980 the Maasai Range Development Project sponsored by USAID was undertaken to establish large village ranches, provide essential infrastructure, and increase livestock productivity. Although for a number of reasons was not significantly, increased four of the Ranches are currently in operation, including two in Monduli, and one each in Kiteto and Ngorongoro Districts. The Maasai Range Development Project includes equipment and staff for the surveying and construction of dams and water systems.

VI. Detailed Project Description:

The Regional Range and Dairy Development Program provides an implementation plan for the development of the livestock industry depending on the land use planning priorities of the Districts. In each case, organizational structures will be developed taking into consideration the following factors:

- Political: national priority given to establishing group and communal production;
- Technical: provision of essential infrastructure, such as dips and water systems;
- Technical assistance: provision of training and extension services; and
- Productivity targets: for regional consumption and surplus for national consumption and export.

The Ten Year Plan for the three Maasai districts: Monduli, Ngorongoro, and Kiteto provides for the establishment of Village Group Ranches, small village ranches, ranching by national and regional institutions such as parastatals, District Development Corporations, schools and technical colleges, and for individual ranching.

Ten Village Group Ranches will be established as follows:

<u>District</u>	<u>Name</u>	<u>Acreage</u>	<u>No. of Cattle</u>
Monduli	Leken	45,000	3,000
	Tanganyet	100,000	8,000/10,000
	Mswakini	25,000	2,000
	Engarenaibor	100,000	8,000/10,000
	Moita	45,000	3,000
Kiteto	Naberera	100,000	8,000/10,000
	Olmoti	40,000	3,000
Ngorongoro	Oldosokwan	30,000	2,500
	Soitsambu	30,000	2,500
	Malambo	30,000	2,500

Seventy small Village Ranches will be established as follows:

<u>District</u>	<u>No. of Villages</u>	<u>No. of Cattle</u>
Monduli	30	100-500
Kiteto	20	100-500
Ngorongoro	20	100-500

In the three primarily agricultural District: Arumeru, Hanang, and Mbulu twenty-three village dairy farms will be established with an average of 20 - 100 dairy cattle, as follows:

Hanang	13
Mbulu	5
Arumeru	5

In addition, ten Village Group or Large Village Ranches will be established as follows.

<u>District</u>	<u>Name</u>	<u>Acreage</u>	<u>No. of Cattle</u>
Hanang	Gawidu/Getanuwas	16,000	2,000
	Dangaida/Mwanga	40,000	5,000
	Basaedash/Gorowja	8,000	1,000
	Dirma	24,000	3,000
	Sahandu	16,000	2,000
	Balangdalalu	16,000	2,000
	Vilima Vitatu	40,000	5,000
Mbulu	Endadubu/Endanyawish	40,000	3,000
	Yaeda Chini/ Dugumagin	40,000	3,000
	Matala	40,000	3,000

The Regional Range and Dairy Development Program consists of the following projects, with level of expenditure during the ten year period:

<u>Project</u>	<u>Target</u>	<u>Level of Expenditure</u> <u>1982/83 - 1991/92</u>
1. Surveying and Plans:		
Ranches	43 Ranches	
Dams	47 Dams	T.Shs. 1.1 million
Boreholes	19 Boreholes	
2. Piped Water Systems for Group Ranches and Dips	43 Ranches 39 Dips 54 Km.	T.Shs. 4.1 million
3. Construction of Dams	47 Dams	T.Shs.15.5 million
4. Construction of Bore- holes	19 Borehole and Headworks	T.Shs. 9.0 million
5. Construction of Worker's Quarters	38 Worker's Quarters	T.Shs. 5.7 million
6. Construction of Dips	37 Dips	T.Shs. 2.6 million
7. Construction of Calf- Pens and Milking Sheds	30 on Dairy Farms	T.Shs. 2.4 million
8. Vehicles and Equip- ment	10 Landrovers 4 Tractors 4 Mowers 12 Motorcycles 4 Ploughs 2 Harrows	T.Shs. 3.0 million
9. Tsetse Clearing and Control	18 Ranches 5,000 hectares cleared 90,000 hectares sprayed	T.Shs.10.4 million
Total Expenditure over Ten Years		T.Shs.53,800,000.0

VII. Cross-sectoral Coordination:

The Regional Range and Dairy Development Program is based on land use planning priorities established according to agro-ecological potential. In addition to an integrated extension approach to establishing these priorities, the following Small Scale Industries will be developed in coordination with this program:

- Animal Feeds production;
- Ox-cart manufacture, for transportation of feeds and produce; and
- Leather Goods industry.

Livestock marketing development will be coordinated by the Tanzania Livestock Marketing Corporation.

VIII. Existing Project Preparation Documentation:

Livestock Strategy: Arusha Region (Sera ya Mifugo Mkoa wa Arusha) Prepared by the Regional Development Directorate and the Regional Livestock Development Department, Arusha Region, August, 1982.

IX. Action Required:

Annual implementation plans. Discrete projects for donor funding can be developed on the basis of project activities or area development programs.

Long Term Investment Proposal - Livestock

P. 2.2

I. Project Title: Arusha Agro-Industrial Project

II. Project Objectives:

To increase agricultural production of the raw materials required for the production of animal feeds.

To develop a large scale high technology animal feed production facility to produce animal feed, the shortage of which is a major constraint to livestock production both regionally and nationally.

To develop the poultry and pig production industries.

Through the technical assistance provided under this project, to develop the technological skills required for further development of agro-industries in the region.

III. Project Location:

The Animal Feed Production Center and Pig and Poultry Production Facilities to be located in Arusha Urban District. The Pilot Farms for agricultural production of raw materials for the animal feed to be located in Arusha Urban District and Arumeru District.

IV. Estimated Cost:

T.Shs. 371,200,000.0

The Feasibility Study for this project was undertaken by the OCM SACCO Consortium, Italy, which will implement the project. A T.Shs. 278,400,000.0 loan is anticipated to be provided by American Express International, with the Government of Tanzania to provide T.Shs. 92,800,000.0 equity, to be divided among SHUMA, the Arusha District Development Corporation, the central government, and the Arusha Regional Development Directorate. The Annual Value of Production is estimated at T.Shs. 171,687,510.0.

V. Background and Rationale:

One of the major constraints to the livestock industry both in Arusha Region and nationally is the shortage of animal feeds, in particular protein concentrates. The Arusha Agro-Industrial Project will address one of the Region's small industry strategies, processing of agricultural raw materials, while addressing the regional and national needs for animal feed including premixes and protein concentrates. In addition to the finished feeds, the livestock components will include the production of chicks to assist the

development of the poultry industry, and the production of meat through pig production. Each of these finished products is in short supply in neighboring countries, and export of the products to the extent that is desirable at the time will help to generate needed foreign exchange.

VI. Detailed Project Description:

The Arusha Agro-Industrial Project consists of the following components:

- Agricultural Development, for the production of raw materials to be processed into feed;
- Livestock production: Poultry and Pigs; and
- Processing of the Agricultural Raw materials and livestock by-products into finished animal feeds.

Specific components and the capacity of production are as follows:

A. Pilot Farms:

- Cereal production (Maize, grains, Barley and other) 22,000 tons p.a.
- Protein generating production (Leguminous products: soybean meals, sunflower seed meal, groundnut meal) 15,000 tons p.a.

B. Animal Feed Production Center:

- Premixes and protein concentrates 40,000 tons p.a.

C. Hatchery:

- One day old chicks 1,500,000 p.a.
- Poultry meat 590 tons p.a.

D. Pig Breeding Center:

- Swine breeders with high pedigree available for other breeding centers (excluding the quota for the breeding center replacement) 325 p.a.
- Pig meat 900 tons p.a.

E. Slaughterhouse:

- Maximum capacity for pig slaughter 61,000 heads p.a.
- Maximum capacity for poultry 2,370,000 heads p.a.

F. Waste Treatment Center and Fertilizer Production:

- Organic substances 912.5 tons p.a.
- Inorganic substances (nitrogen, potassium, phosphate) 120 tons p.a.
- Total raw manure treated 5,700 tons p.a.

G. Houses for Workers' Families:

- Five houses for ten families.

VII. Cross-sectoral Coordination

The Arusha Agro-Industrial Project involves both agricultural development, with the pilot farms to provide raw materials for the animal feeds, and the development of the livestock industry in Arusha Region, specifically for poultry and pig production, and through the provision of animal feeds for livestock in general. In addition to the development of high technology processing of agricultural and livestock products, technological skills will be developed to contribute to further industrial undertakings in the processing of other agricultural, livestock and other natural resources of Arusha Region.

VIII. Existing Project Preparation Documentation:

Arusha Agro-Industrial Project: Feasibility Study

OCM SACCO Consortium, Piazza Montecitorio, 115, Rome, Italy
March 28, 1981.

Arusha Agro-Industrial Project: Abstract of the Feasibility Study

OCM SAACO Consortium, Piazza Montecitorio, 115, Rome, Italy
March 28, 1981

IX. Action Required:

Negotiation of financial arrangements and an implementation plan.

III. OBJECTIVE THREE: INCREASING EMPLOYMENT AND REVENUES

The third investment objective of the Region is to generate revenue, including foreign exchange earnings, and employment through the production of export crops, tourism and industries that add value to the Region's natural resources. The Region has a history of realizing these potentials, but the current economic situation and its affect on the import requirements of these development activities has led to a gradual decline.

3.1 Analysis of the Objective

The long-term viability of the Region's economic development will depend in large part on the generation of foreign exchange and on the creation of employment opportunities, particularly as population pressures on the land increase. With the current balance of payments situation, the development of these initiatives will have to be evolutionary, with a major emphasis on import substitution combined with discrete investments in proven export-oriented activities.

Arusha Region is one of the main industrial centers in Tanzania, and in accordance with national policy has placed priority on self-sufficiency in supplying basic producer goods such as steel, cement, other building materials and chemicals and on providing consumer goods and services necessary for meeting basic needs of food, housing, transport, health and education. Investments have tended to favor large scale, publically owned enterprises to the neglect of District and village-based activities. As a major development policy, the Region has adopted a medium-term strategy of concentration on small scale industries that add value to the Region's natural resources. These efforts have included production facilities for ox-drawn equipment and other appropriate agricultural implements, the processing of

agricultural, livestock and natural resource products, and the production of materials for construction such as bricks and tiles. There is a need to continue the development of these rural industries while laying the groundwork for larger scale investments.

Further development of revenue and employment generating activities also rests with improvements in export crop production and processing. A comparison of the 1966 and 1980 figures on export crop production shows that many of the economic woes of Tanzania would not have occurred if production levels had been maintained. For Arusha Region, the primary export crop is coffee which is a proven foreign exchange earner in spite of international price fluctuations. Currently, the EEC is investing in the revitalization of the coffee industry, but further project development and the adoption of favorable national policies are required if this industry is to reach its potential as reflected by the production figures in 1966. A second export crop potential is pyrethrum, the production of which has improved since the government's increase in producer prices. However, the long-term viability of this industry depends on locating a reliable international market and improvements in processing which will allow Tanzania to offer a refined product comparable to its competition.

Another potential is the development of the mining industry in the Region, taking advantage of the Region's mineral and precious stone resources. A first step has been taken by Finnish Aid to develop phosphate mines in Hanang District, such initiatives will be encouraged with a full analysis of their revenue and employment generating potentials as well as the costs of these operations.

Two related areas which are included in the medium-term plan and which have potential for long-term development are fisheries and beekeeping. Fishing is a relatively new activity in Arusha

Region and many fishermen appear to be migrants from other areas where fishing was traditionally practiced. Today small-scale fishing activities occur in most major rivers and lakes. Natural resources officials and district planners have recommended that fresh water fishing in the Region's numerous lakes and streams be promoted and that villages be assisted in establishing a fishing industry. Sufficient bodies of water and technical knowledge are available. More important, the development of fishing and fish culture would not compete with traditional agricultural and livestock management practices and would add a rich source of protein for human requirements.

Both traditional and commercial beekeeping are practiced in the Region. Traditional harvesting of wild bee honey is most common in the highlands of Hanang and Mbulu Districts. The beekeeping Division of Arusha Region and several villages practice commercial production. The potential for production of honey and beeswax is very much underexploited, but programs have been established to promote a growth in the industry through introduction of transitional and modern hives.

3.2 The Medium-Term (Five Year) Plan

Under the Medium-Term Plan, the Region will continue to concentrate its efforts to develop the small scale, rural industries sector with emphasis on adding value to agriculture, livestock and natural resources activities as well as on steps to become self-sufficient in basic materials production. The main project requiring external assistance, as a whole or for specific activities, is:

Rural Industries Development

20,600,000 T.Shs.

This project is designed to further develop district and village based industries that add value to the Region's natural resources. It will provide financing for the testing

and expansion of small scale industries such as those established under APVDP. Major areas of investment include:

- Development of assembly and maintenance facilities for agricultural implements in the three Maasai districts;
- Establishment of additional brick and tile production facilities;
- Identification and development of agriculture and handicraft industries in direct support of tourism;
- Continued development of village agro-processing industries such as grain grinding mills and oil presses;
- Introduction of village soap production processes;
- Establishment of timber cutting and carpentry industries;
- Development of industries to process livestock industry by-products such as hides;
- Development of ghee and dairy processing industries;
- Improvement of village level pyrethrum drying and processing facilities; and
- Development of cloth and clothing production industries.

This project offers opportunities for larger scale foreign donor funding and village specific development efforts financed by private voluntary organizations.

(See Vol. 3: Five Year Development Plan, Part II, Section 2.31)).

3.3 Priority Long-Term Plan Projects

Priority projects under the long-term plan propose major investments that will increase revenues and employment, taking advantage of the increased technical know-how and management capabilities developed under the medium-term plan. Specific projects include:

P3.1 Vegetable and Fruit Canning and Processing Industry 10,000,000 T.Shs.

This project is designed to develop a fruit and vegetable processing facility and industry in Arumeru District. It involves the establishment of either an automated plant for canning or a fruit and vegetable dehydration plant. The project will take advantage of the potential for irrigated fruit and vegetable production in the area.

P3.2 Lime Pozzolana Cement Production 30,000,000 T.Shs.

This project is designed to establish a lime-pozzolana cement production facility which will provide low cost construction materials; the project is based on a pilot project established at Oldenyo Sambu which has tested the process. The proposed project will produce approximately 10,000 tons per year and consists of the following components: the development of raw material mining units, the establishment of the production facility, development of marketing and organizational arrangements, and provision for the basic transport infrastructure.

P3.3 Salt Extraction and Processing - Lake Balangida 10,000,000 T.Shs.

The purpose of this project is to develop a salt extraction and processing facility at Lake Balangida in Hanang District to provide salt for domestic consumption and for the production of a surplus for distribution to other regions in Tanzania. Project components include a salt extraction unit for mining, a processing plant, a packaging facility, organizational arrangements, and infrastructure development for transportation.

P3.4 Soda Ash Production - Lake Natron 3,000,000,000 T.Shs.

Supported by feasibility studies done by Japanese and American firms, this project is designed to develop a major industry for soda ash (sodium carbonate) at Lake Natron. With the increasing costs of synthetic production of sodium carbonate as an industrial raw material, extraction and processing of natural deposits has become the most important potential source for this material. Studies show that the reserves of soda ash in Lake Natron consist of 109.0 million tons in the

crust and 27.0 million tons in associated brines. To develop these resources, the project will include the following components:

- Construction of a processing plant and township on the eastern shore of Lake Naron;
- Construction of a power and steam generating facility based on coal;
- Rehabilitation and construction of 175 kms. of road from Lake Natron to a point on the railway near Arusha;
- Railroad modification and extension, to include 5 kms. at Arusha and 16 kms. at Tanga port; and
- Development of railhead and port facilities.

Actual plant and directly related facilities at Lake Natron would cost about U.S. 120 million, with the remaining amount for operations and infrastructure development.

P3.5 Private Sector Tourism Development

80,000,000 T.Shs.

The purpose of this project is to upgrade the private tourism sector to complement the investments being made in the Tanzanian Tourist Corporation by the World Bank. The project will provide loan financing for improving the 16 private sector tourism facilities in the northern zone, for the purchase of hotel equipment and supporting vehicles, and for internal and external marketing operations. The project will be carried out through a cooperative of the owners of these facilities.

P3.6 Wildlife Utilization Project

30,000,000 T.Shs.

This project will develop a comprehensive program to utilize fully the wildlife potential in the Region. The project includes components for wildlife cropping schemes, revenue generation through hunting fees, the breeding of exotic species for export sale, and the further development of tourism for wildlife viewing.

3.4 Project Ideas to be Developed

Over the long-term, the employment and income generating potential of the Region rests with the development of the industrial sector. The potentials of this sector are seen through this limited set of projects which could well have a major impact. In addition, the Small Industries Development Organization (SIDO) has identified several potential investments. Moreover, as outlined under the Livestock objective, there is a potential for a major agro-industrial project which would result in significant foreign exchange earnings. Other priority projects to be developed include:

- The production of soap and soap products which is a main village need;
- The development of the spice production industry, as mentioned under the Agriculture objective, for marketing to international processing companies;
- The extension of phosphate mining operations to Lake Eyasi, in Mbulu District;
- The mining of gold, copper, iron-ore, and semiprecious stones in Kiteto District; and
- The development of the fisheries industry in the Region. A program should be developed for the construction of fish-receiving centers on the major lakes and for extension activities to assist villages in the establishment of fishponds.
- Export Crop Production and Processing.
 - Coffee - Projects to be developed to improve the provision of inputs and credit, seedlings, insecticides, fertilizers, improved extension services, and drying and processing facilities. Improved marketing program to be developed to encourage the expansion of small-holder expansion of coffee-growing.
 - Pyrethrum - Projects to be developed for pyrethrum drying and processing facilities, and for improved extension services to encourage the expansion of pyrethrum-growing.

- Programs for the expansion and development of additional export crops including seed beans, pigeon peas, and spices.

Long-Term Investment Proposal - Industries

P. 3.1

I. Project Title: Vegetable and Fruit Canning and Processing Industry

II. Project Objectives:

Development of an export-oriented vegetable and fruit processing facility and industry to take advantage of the potential for irrigated production of vegetables and fruit in the Ngare Nanyuki horticultural area on the eastern slopes of Mt. Meru.

III. Project Location:

Ngare Nanyuki Village, Arumeru District. The project area is located on the eastern slopes of Mt. Meru approximately 50 km. northeast of Arusha.

IV. Estimated Cost: T.Shs. 10,000,000

V. Background and Rationale:

Preserved fruits and vegetables is an agro-based industry which is ideally suited as an instrument for rural industrialization. It encourages development of commercial cultivation and brings returns to the areas growing these vegetables and fruits through a large value added processing.

The Ngare Nanyuki area on the eastern slopes of Mt. Meru is a horticultural area with both existing and potential irrigation to provide a steady supply of raw materials for processing. Approximately 3,000 acres is currently under irrigation and tomatoes have become a primary cash crop. There is a large potential for cultivation of other vegetables such as carrots and beans and a wide variety of fruits for various forms of processing including canning, dehydration and the production of purees and extracts.

Although there are a range of technologies to select from, varying in capacity, the area has a large production capacity and a medium to large scale facility would be needed to be competitive with the NMC facility in Korogwe. Vegetable dehydration for the export market is an area of high potential, since dehydration reduces weight by up to 95% making air freight shipments to Europe feasible. Although various solar dehydration schemes may have some

potential on a small scale, a high technology dehydration plan, using a variety of fuels, would be needed to insure a competitive economic operation.

VI. Detailed Project Description:

Two major alternatives are available for development of the processing facility:

- An automated plant for canning. Processing facility would include: vegetable and fruit preparation, blanching, can sterilization, syrup or brine preparation, can filling, exhaustion, can sealing, processing and cooling.
- A vegetable and fruit dehydration plant. This involves much less costly packaging, but serves a speciality market.

A full feasibility study including market survey would be needed for either of the alternatives.

VII. Cross-sectoral Coordination:

Development of the export-oriented vegetable and fruit processing facility is a cross-sectoral project involving agriculture and rural industrialization.

VIII. Existing Project Preparation Documentation:

Rural Industries Guide No. 1. Fruit and Vegetable Canning.
SIDO, Arusha, August 1974.

Pre-Feasibility Study No. 214. On Preserved Fruits and Vegetables, for District Development Corporation Njombe (Iringa) SIDO, Economic Services Division, 1978. Provides data relevant to the Arumeru project.

Small Industry Projects, Arumeru, SIDO, Arusha File.

IX. Action Required:

Full feasibility study and negotiation of funding.

Long-Term Investment Proposal - Industries

P. 3.2

I. Project Title: Lime-Pozzolana Cement Production

II. Project Objectives:

Development of a Lime-Pozzolana Cement Production facility to provide a low cost construction material for low cost housing and other construction needs in Arusha Region and for export to other regions in Tanzania.

III. Project Location:

Lime Pozzolana Cement Production Facility: Arumeru District, Oldonyo Sambu area west of Mt. Meru.

Pozzolana deposits: west of Mt. Meru in Oldonyo Sambu area.

Lime deposits: Four alternatives: Mifiraigi, 67 km. from Arusha Naberera, 153 km. from Arusha Kambi ya Chokaa, 80 km. From Arusha Mto wa Mbu, 115 km. from Arusha.

IV. Estimated Cost: T.Shs. 30,000,000

V. Background and Rationale:

Cement is in short supply in Tanzania, and the little that there is, is expensive. The opening of the new Tanga and Mbeya factories in 1981 has led to an increase in the production of portland cement, but continual inflation has led to its becoming very expensive. Also, the distribution system from Tanga is not sufficient to supply all of Arusha Region's needs.

Lime-Pozzolana, a mixture of slaked lime and an active pozzolana, such as volcanic ash, provides a much more economical binding agent suitable as a substitute for portland cement in mortars and in concrete where no high strength is required. It can be produced in substantially smaller units than portland cement, at lower investment cost, and is less energy consuming.

High grade deposits of both volcanic ash pozzolanas and limestone have been investigated in Arusha region. Pilot production has begun at the Oldonyo Sambu Pozzolime Industry, which began trial production in February 1978 and full production, small scale, in May 1978 with the support of SIDO.

Sufficient deposits and a large market are available for development of a medium scale industry.

VI. Detailed Project Description:

The project would consist of the following components:

- Raw material mining units: limestone, pozzolana, gypsum;
- Production facility, mixing/bagging unit;
- Development of organizational arrangements;
- Development of transport infrastructure; and

The proposed capacity of the project is 10,000 tons per year.

VII. Cross-sectoral Coordination:

Development of a low cost binding material for construction would have a major impact on development of low cost housing in Arusha Region. Construction activities in each of the sectors would be considerably enhanced leading to more efficient and productive manpower and services.

VIII. Existing Project Preparation Documentation:

Oldonyo Sambu Pozzolime Industry History, Operation and Development. J.T.M. Sauni, J.H. Sakula, SIDO, Arusha, June 1980.

Investigation of Limestone Deposits near Arusha Region for a Proposed Lime-Pozzolana Project. D.S. Richardson, P.C. Dixit, Department of Geology, University of Dar es Salaam, November, 1980.

Lime Pozzolana Files. SIDO, Arusha.

IX. Action Required:

Detailed feasibility study (Estimated Cost T.Shs. 900,000).

Final project design.

Negotiation of funding. Potential for funding of feasibility study has been explored with UNCDF.

Long-Term Investment Proposal - Industries

P. 3.3

I. Project Title: Salt Extraction and Processing - Lake Balangida

II. Project Objectives:

To develop a salt extraction and processing facility at Lake Balangida in Hanang District to provide salt for domestic consumption in Arusha Region and for production of a surplus for distribution to other Regions in Tanzania.

III. Project Location:

Lake Balangida, Hanang District, located 80 km. west of Babati on the road to Mbulu.

IV. Estimated Cost: 10,000,000 T.Shs.

V. Background and Rationale:

A major strategy of the region is to develop rural industries based on existing natural resources. Geological surveys investigating Lake Balangida in Hanang District have indicated major reserves of salt which could be easily extracted for processing.

Detailed chemical analysis has not been carried out on the salt available at Lake Balangida, but initial observations indicate that at least medium-scaled processing will be required to reduce the content of flourine and other chemicals, with the possibility of including iodine as an additive. Detailed feasibility studies and chemical analyses will have to be carried out.

Logistically, Lake Balangida is well situated for development of the industry. Located 80 km. west of Babati, Lake Balangida is on the district road to Mbulu District which has recently been rehabilitated by APVDP. Babati is a major crossroads for Arusha, Dodoma and Singida.

VI. Detailed Project Description:

The project would consist of the following components:

- A salt extraction unit for mining;
- A processing plant for chemical processing;
- A packaging facility;

- Development of the organizational structure; and
- Infrastructure development for transportation.

VII. Cross-sectoral Coordination:

Development of the salt extraction and processing rural industry would provide salt not only for human consumption, but could also be designed to contribute to the development of the livestock industry through provision of raw materials for mineral supplements.

VIII. Existing Project Preparation Documentation:

Lake Balangida: Observations During Reconnaissance, August 1952 - February 1953. Geological survey of Tanganyika, Report T.C.J. No.18, J.C. Jones, J.H. Harris, J.A. Stevens, June 1953. Available at Mineral Resources Division, Dodoma.

Development of Salt Production in Tanzania: Findings and Recommendations. P. Subramanian, UNIDO, December 1980. Mineral Resources Division, Dodoma, File URT/74/015.

Evaluation. SIDO, 1978.

IX. Action Required:

Detailed chemical analysis, full feasibility study, and negotiation of funding.

Long-Term Investment Proposal - Industries

P. 3.4

I. Project Title: Soda Ash Production - Lake Natron

II. Project Objectives:

Development of a major industry for soda ash (sodium carbonate) production at Lake Natron, including the necessary infrastructure for export from Tanga Port.

III. Project Location:

Lake Natron, Monduli District. Production facility and settlement to be constructed on the eastern shore of Lake Natron, 150 km. northwest of Arusha and 450 km. from Tanga Port.

IV. Estimated Cost: T.Shs. 3,000,000,000

V. Background and Rationale:

With the increasing costs of synthetic production of sodium carbonate as an industrial raw material, extraction and processing of natural deposits has become the most important potential source for the material. Outside of the United States, 94% of production is through the expensive synthetic process. Through exploitation of natural deposits in the western states of Wyoming and California, the U.S. currently produces 90% of the world's supply from natural deposits.

Outside of the U.S. there are only three major natural deposits. The deposit in Botswana is located in an area of adverse climatic conditions. Lakes Magadi in Kenya and Natron in Tanzania are the only other significant, exploitable deposits.

One of the major alternative processes for production of anhydrous sodium carbonate is through solar evaporation from ponds. Lake Natron offers an ideal environment both topographically and climatically, providing a high grade resource with low cost processing potential.

The project thus has significant potential for attracting large-scale private investment. The main drawback is the very high infrastructure development costs and freight costs.

Feasibility studies and geological surveys have estimated reserves of soda ash at Lake Natron as follows:

- In the crust: 109.0 million tons; and
- In associated brines: 27.0 million tons.

Current marketing estimates show a potential market in the mid- to late-1980's of 700,000 tons/year being available if the Natron Ash were price competitive.

Higher land freight costs within Tanzania offset Tanzania's sea freight advantage over the U.S. into southern Europe. Lake Magadi has similar potential for expanded production and is already on a rail line, and would be a major competitor for investment.

Government involvement in this large scale operation would have to include the upgrading and extension of present rail links and of port facilities in Tanga. Plans for the extension of the rail link from Arusha to Lake Victoria would significantly reduce the infrastructure costs of this project and make it economically attractive for overseas investment.

VI. Detailed Project Description:

The project would consist of the following components:

- Construction of a processing plant and township on the eastern shore of Lake Natron;
- Construction of a power and steam generating facility based on coal;
- Project finance of rehabilitation and construction of 175 km. of road to a point on the railway near Arusha;
- Railroad modification and extension: 5 km. at Arusha, 16 km. at Tanga port; and
- Development of railhead and port facilities.

Actual plant and directly related facilities at Lake Natron would cost U.S. \$120 million. Fifty percent of total project costs would be for infrastructure development.

VII. Cross-sectoral Coordination:

A large-scale industrial investment of this nature would have a major impact for both infrastructure development and employment generation. The temporary nature of much of the employment during development of the plant would require careful regional planning to avoid economic dislocations due to such factors as labor in-migration.

VIII. Existing Project Preparation Documentation:

Report on the Potential of Lake Natron, Tanzania, as a Soda Ash Producer. Japan International Cooperating Agency, 1976.

Evaluation AMAX Exploration, Inc., Denver, Colorado, 1981.

Geological Survey of Lake Natron, 1952. File with Mineral Resources Division, Dodoma.

IX. Action Required:

Extensive pumping tests to determine quantity of in situ brine recoverable by pumping.

Agreement on infrastructure development and negotiation of investment arrangement.

Long-Term Investment Proposal - Rural Industries

P. 3.5

I. Project Title: Private Sector Tourism Development

II. Project Objectives:

The purpose of this project is to upgrade the private tourism sector to complement the investments being made in the Tanzanian Tourist corporation by the World Bank. More specifically the objectives of this project are:

- To provide loan financing for improving the 16 private sector tourist facilities in the northern tourist zone;
- To provide loan funds for the purchase of equipment and vehicles by these facilities; and
- To form a cooperative for improving internal and external marketing.

III. Project Location:

The Project will assist the 16 private tourist facilities in the northern tourist zone.

IV. Estimated Cost:

T.Shs. 80,000,000

V. Background and Rationale for the Project:

The rich wildlife and natural resources of the Region provide a strong attraction for tourists which can be a major foreign exchange earning industry though the import requirements are high. In recognition of this, the World Bank is investing in improvements in the existing Tanzanian Tourist Corporation facilities as well as the roads and infrastructure necessary for support. There is a need to complement this investment through the upgrading of private sector tourists facilities, including improvements in infrastructure, equipment and vehicles, and marketing.

VI. Detailed Project Description:

Loan financing is anticipated for this project, possibly through the International Finance Corporation. The project calls for the 16 private sector tourism facilities in the northern zone to form a cooperative through which:

- Loans will be made to make improvements to existing facilities;

- Loans will be made to purchase hotel equipment and supporting vehicles; and
- Marketing will be improved internally and externally through joint operations to supplement those of the Government.

A prerequisite for the loan financing will be an increase in the foreign exchange allotments to participating facilities so that the credit can be paid off in hard currency.

VII. Cross-sectoral Coordination:

Under the Medium-Term Plan, the Region will continue to develop supporting activities (agriculture and handicrafts) for the tourism industry. With improved and expanded operations, these inputs will have to be increased.

VIII. Existing Project Preparation Documentation:

The background documentation for this project may be found in the Sector Assessment of Tourism in the Arusha Region of Tanzania, done by Dr. Victoria A. Morss. The detailed project proposal will draw on the Tourism Project Appraisal done by the World Bank.

IX. Action Required:

For project development, the specific requirements of the private sector tourism facilities must be identified and an analysis of national benefits and costs done. With this a detailed implementation plan can be developed.

Long-Term Investment Proposal - Wildlife

P. 3.6

I. Project Title: Wildlife Utilization Project

II. Project Objectives:

To develop a program to utilize fully the tremendous wildlife potential of Arusha Region for the benefit of its inhabitants through a comprehensive program for wildlife conservation, control and utilization. The program would include components including wildlife cropping schemes, revenue generation through hunting fees, breeding of local exotic species for export sale, and development of the tourism potential for wildlife viewing.

III. Project Location:

Wildlife areas in Ngorongoro, Monduli and Kiteto Districts and in Mbulu District in the Yaeda Valley.

IV. Estimated Cost: T.Shs. 30,000,000

V. Background and Rationale:

Arusha Region possesses a wealth of wildlife in numbers, biomass and diversity (Ecosystems, 1980). A great deal of the land of the Region is set aside to support the diverse and abundant wildlife. This includes the three National Parks (Lake Manyara, Arusha and Tarangire) which cover 2 percent of the Region and contain 1 percent of the wildlife; the Ngorongoro Conservation Area (NCA) which covers 8 percent of the Region and holds 76 percent of the wildlife; 11 Game Controlled Areas (GCA) which cover 46 percent of the Region and hold 28 percent of the wildlife; and one small Game Reserve, Mount Meru. About 44 percent of the land containing 4 percent of the wildlife lies outside any kind of wildlife management area. The Region contains an estimated 1,955,000 head of wildlife, the majority (91 percent) being plains wildlife.

In the National Parks and the Ngorongoro Conservation Area land use is controlled by law. In the former only wildlife conservation and tourism are permitted. Multiple land use is, in theory, permitted in the Ngorongoro Conservation Area, though in practice it is restricted to forestry, wildlife conservation, tourism, and stock rearing (mainly pastoral). Settlement and agricultural development are discouraged. In the Game Controlled Areas land use is not controlled and multiple land use patterns can be observed. Hunting is controlled, however, by setting quotas and

issuing permits. In summary, wildlife is totally secured in 10 percent of the land area, protecting about 68 percent of the wildlife population of the Region. However, there are large areas, particularly in the Maasai Districts, which harbor significant wildlife populations and which presently fall within village boundaries. Furthermore, several National Park and Conservation Area wildlife populations are seasonally dependant on areas outside of Park or Conservation Area boundaries, e.g., Ngorongoro and Serengeti populations are dependant on areas in Loliondo Division, Ngorongoro District, and Tarangire wildlife are dependant on Simanjiro, Kiteto District.

Present trends of a rapidly growing human population and consequent land pressure coupled with the increasing economic value of wildlife products (e.g. elephant tusks, rhino horns, skins, and meat) combine to portray a dismal picture of the future viability of the wildlife population outside of the protected areas. In other words due to loss of habitat and illegal hunting it is likely that the wildlife population outside of protected areas will dwindle to nothing by the turn of the century unless some means for local benefit from wildlife are instituted.

The proposed project is for a comprehensive and rational program of activities to utilize the potential wildlife resources for the benefit of the inhabitants of Arusha Region in a manner that will lead to the sustainability of this resource.

VI. Detailed Project Descriptions:

Detailed feasibility studies will need to be carried out for each of the components of this program, including the following:

- A system of hunting license fees and surcharges to generate and channel income to village development in the wildlife areas. Wildlife management should include a carefully controlled system for local utilization of wildlife in areas of traditional hunting;
- Game cropping schemes based on scientific principles of animal production to ensure the continuous, sustainable supply of animal products - meat, hides, trophies, etc;
- Breeding and ranching schemes for the export sales of exotic species; and
- Development of the tourism potential for wildlife viewing in areas outside the present National Parks and Conservation Areas.

VII. Cross-sectoral Coordination:

Development of a wildlife management and utilization program will require careful coordination with the Livestock Development Department and the parastatals involved in tourism (National Parks, NCA) and wildlife (TAWICO).

VIII. Existing Project Preparation Documentation:

The Status and Utilization of Wildlife in Arusha Region, Tanzania, Final Report. Ecosystems Ltd., September 1980.

Sector Assessment of Tourism in the Arusha Region of Tanzania. Victoria Morss, May 1980.

Perspectives on Game Cropping in Arusha Region, I.S.C. Parker, September 1980. (Included in Ecosystems Report).

A Proposal to Institute Wildlife Benefits to Villages through a Surcharge on Hunting Fees. J.R. Kente, Regional Game Officer, Arusha Region, David Peterson, November 1981.

IX. Action Required:

Detailed feasibility study on each of the components of the program and negotiation of funding.

IV. OBJECTIVE FOUR: DEVELOPING AND MAINTAINING A COMMUNICATIONS NETWORK

The fourth investment objective of the Region is to develop and maintain a communications network that contributes to economic development. Economic development, and in particular village development, depends on a well-designed and maintained network of roads since air and rail transport comprise only a small part of the communications network and are used primarily to supplement road transport.

4.1 Analysis of the Objective

Except for foreign donor road rehabilitation projects, there has been widespread deterioration of the majority of all main trunk district and feeder roads in the Region, adversely affecting the rural economy and the ability of the government to deliver vital services. In large part, this has been due to reduced recurrent development expenditures on roads maintenance, poor management and organization in Regional and District Comworks, inadequate maintenance facilities, and the lack of trained engineers, managers and mechanics.

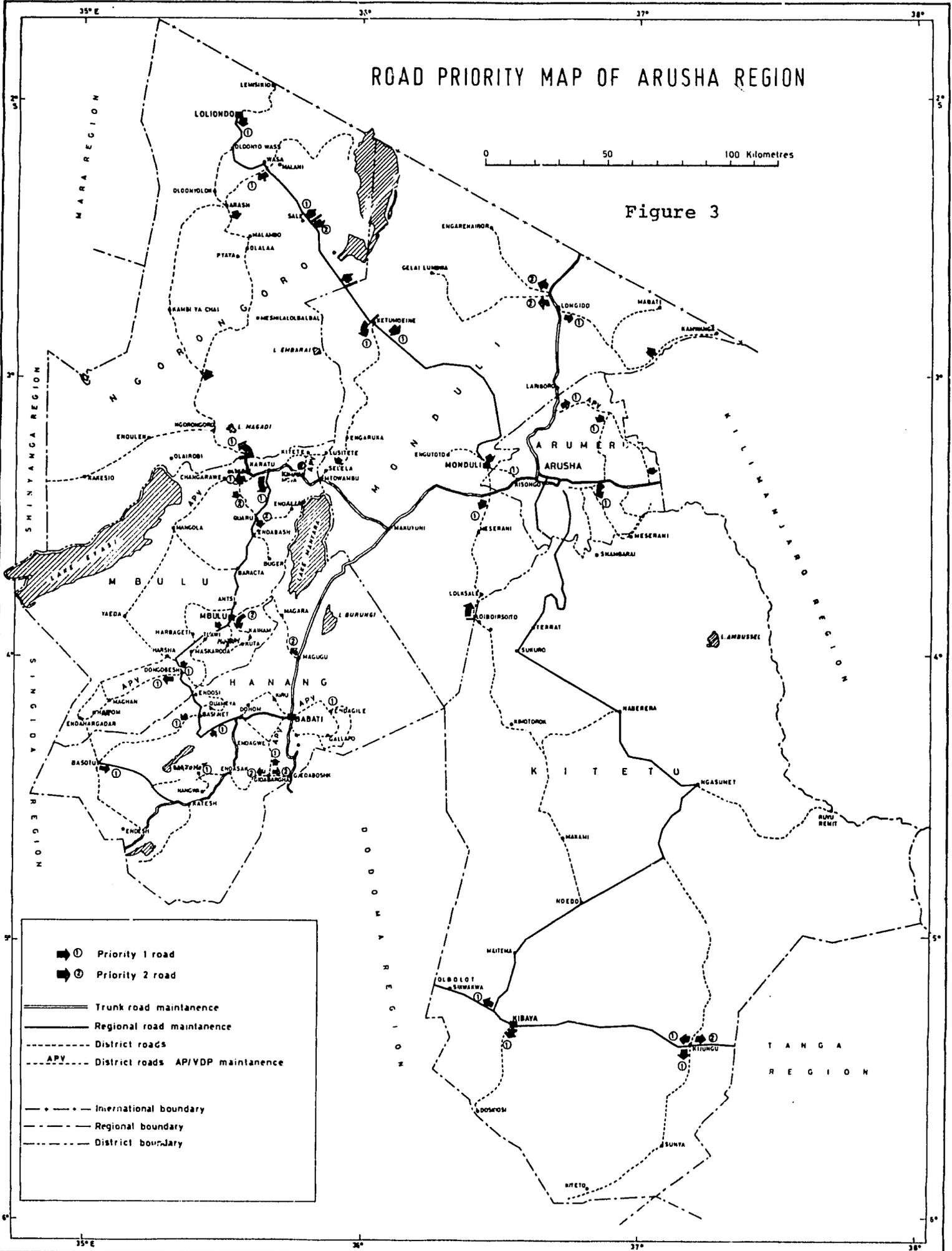
In its regional planning exercise, the Region and six districts identified a primary roads network (Figure 3) that will meet economic development and administrative requirements. This network consists of the following:

<u>District</u>	<u>First Priority</u>	<u>Second Priority</u>	<u>Total</u>
Mbulu District	267 km	106 km	373 km
Arumeru District	196 km	173 km	369 km
Hanang District	277 km	64 km	341 km
Monduli District	215 km	151 km	366 km

ROAD PRIORITY MAP OF ARUSHA REGION

0 50 100 Kilometres

Figure 3



- Priority 1 road
- Priority 2 road
- Trunk road maintenance
- Regional road maintenance
- District roads
- District roads APV/VDP maintenance
- International boundary
- Regional boundary
- District boundary

Ngorongoro District	200 km	60 km	260 km
Kiteto District	190 km	70 km	280 km
REGIONAL TOTALS:	1345 km	624 km	1969 km

Much progress was made by the Region through APVDP on the rehabilitation of the road network in the agricultural districts of Arumeru, Hanang, and Mbulu. There remains considerable work to be done in the three Maasai Districts.

In conjunction with the study of road priorities, the Region conducted a detailed analysis of Regional Comworks, highlighting specific management, organizational and equipment recommendations. The study showed that Comworks has the capability to maintain 1000 to 1500 kms. if recurrent budget allotments are sufficient; however, the full development of regional capabilities will require external assistance. Of primary importance is the development of regional and district maintenance shop capabilities for roads equipment and other regional and district vehicles.

Another requirement for the development of the communications network is increasing transport services. The Region has developed and is testing a model which allows villages or wards to purchase lorries on a loan basis (with loan funds being repaid into a village account for investment in other village development activities) -- this model appears to be working. Finally, the costs of transport can be reduced through a better communication systems (such as a radio network) for the Region.

Although rail transport at present comprises only a small part of the regional communication network, it should be noted that further expansion of the rail network, and development of the railhead facilities in the Region could substantially reduce freight costs, increasing the economic feasibility of several large-scale mining operations (such as soda ash production at Lake Natron). The potential extension of the railroad from Arusha to

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Lake Victoria would lead to a substantial reorientation of the communications network within the Region and have a powerful impact across all economic sectors.

4.2 The Medium-Term (Five Year) Plan

The Medium-Term Plan calls for the rehabilitation and maintenance of a primary roads network for the Region, utilizing as much as possible existing manpower and equipment resources. This emphasis recognizes the importance of the roads network and of the better utilization of existing resources. The proposed projects are designed to rehabilitate and maintain 1624 kilometers of roads. Additional investment through another project addresses the critical need of new bridges and the rehabilitation of existing bridges. Also, the plan provides for the construction and basic equipment of three Comworks maintenance facilities, Arumeru, Ngorongoro, and Kiteto Districts, as well as the strengthening of those in Mbulu, Hanang, and Monduli Districts. These projects and the regional requirement for a radio network (to improve efficiency of government services at reduced costs) can be assisted by the following external investments:

Roads Rehabilitation

23,500,000 T.Shs.

This project provides for the rehabilitation of 1624 kms of roads, selected on the basis of the economic requirements of the Region and districts. It concentrates on the more effective utilization of existing equipment and manpower. (See Vol. 3: Five Year Development Plan, Part IV, Section 4.7(1)).

Bridge Rehabilitation and Construction

13,600,000 T.Shs

Supplementing the above project, this project is designed for the purposes of constructing 36 new bridges and rehabilitating 41 existing bridges. This requirement has been identified by surveys conducted by the Regional Comworks. (See Vol. 3: Five Year Development Plan, Part IV, Section 4.7(2)).

Comworks Maintenance Shops

2,000,000 T.Shs.

This project provides for a basic, functioning maintenance workshop for each of the six districts. It involves the construction and equipping of new facilities in Arumeru, Kiteto, and Ngorongoro as well as strengthening the shops in Hanang, Mbulu, and Monduli Districts.

(See Vol. 3: Five Year Development Plan, Part IV, Section 4.7(3)).

Radio Communication Network

5,650,000 T.Shs.

This project provides for a regional radio network to improve communication, government efficiency in providing services, and reduced transport costs. The systems (as proposed under the APVDP follow-on project) will extend to the 133 wards in the Region.

4.3 Priority Long-Term Plan Projects

Projects under the long-term plan further emphasize the development of the regional roads network, with an emphasis on modernizing operations and maintenance facilities. Also, a village transport project is proposed to overcome the constraint of the lack of transport. Projects include:

P4.1 Upgrading the Region's
Primary Roads Network

296,400,000 T.Shs.

This project is a ten year effort to provide the Region with a sound primary roads network as well as to establish the institutional capabilities of Comworks to maintain this network. The project includes management and organizational assistance to the Regional and District Comworks, training for senior Comworks engineers and managers, the purchase of equipment for purposes of replacement and standardization (and necessary spare parts) and operational funds for the rehabilitation and maintenance of the 1,969 kms. of first and second priority roads in the region's primary roads network.

P4.2 Modernizing Regional Maintenance
Workshop Capabilities

50,000,000 T.Shs.

The purpose of this project is to modernize the maintenance workshop capabilities of the Region and six districts for roads equipment and other government

vehicles. The project will upgrade the facilities of the Regional Comworks to do the necessary heavy maintenance and to provide supporting assistance to the six district workshops. The project will also upgrade the facilities and equipment of the six district workshops to do the day-to-day maintenance of district equipment and vehicles. As part of the project, training will be provided to develop a group of skilled mechanics at regional and district levels.

P4.3 Village Transport Services 48,000,000 T.Shs.

Building on the successful efforts by the Region to introduce lorries at the village and ward levels, this project will provide 120 lorries for sale on a loan basis to villages and wards as determined by district administrations. The funds generated from these sales will be placed in village and ward accounts to further finance village development activities. Also, training will be provided for village drivers and mechanics. This project will increase the availability of regional transport services, with the revenues plus loan payments being used for future development efforts.

4.4 Project Ideas to be Developed

The above projects represent the critical ingredients for developing a sound communications network. In addition, there are three project ideas to be explored and developed.

Regional and District Bus Network

For purposes of the movement of goods and passengers (as well as possibly tourists), there is a need for an improved regional and district bus network which can be operated through private transport concerns or the District Development Corporations.

Railhead Development

If improvements are made in railway services, the Region will develop a project for improved facilities in Arusha. This would allow lower cost shipment of goods, including fuel; also, if the livestock industry is developed sufficiently so that offtake is available for the export market, then this facility will increase profit margins. Extension of the railroad and improvement of railhead facilities would greatly enhance opportunities for investments in mining operations.

These project ideas represent direct investments by the Region. Another critical need is the better maintenance of the main trunk lines which promote inter-regional commerce. This is currently the responsibility of TRM which has not fulfilled its obligations. Since these communication lines are important for regional and national development, there is a need for a project to provide this service, perhaps working through Regional and District Comworks Offices.

Long-Term Investment Proposal - Works

P. 4.1

I. Project Title: Upgrading the Region's Primary Roads Network

II. Project Objectives:

To rehabilitate and to maintain the primary roads network of the Region, consisting of 1,969 kms. of roads, on a long-term basis.

In the process, to upgrade the management and organizational capabilities of Regional and District Comworks, to provide for training of engineers, managers, and equipment maintenance personnel and operators.

III. Project Location:

The Project will support Comworks and its operation at the regional level and in each of the six districts. Road priorities for the regional network are located as follows:

Mbulu District	373 km
Arumeru District	369 km
Hanang District	341 km
Monduli District	366 km
Ngorongoro District	260 km
Kiteto District	260 km

Total	<u>1,969 km</u>
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IV. Estimated Costs: 296,400,000 T.Shs.

V. Background and Rationale:

The Region has identified its primary roads network based on economic development and administrative criteria. With existing resources, and those projected under the five year plan, this network can remain open. However, over the long-term, there are requirements to upgrade the management and organization of Comworks, provide replacement equipment and spare parts, and provide operational funds for the establishment of a sound roads network.

VI. Detailed Project Description:

The project will consist of the following components:

- Provision of management and organizational assistance to the Regional and District Comworks Offices;
- Provision of training for senior Comworks engineers and management personnel;
- Provision of replacement equipment and spare parts for Regional District Comworks Offices; and
- Provision of hard currency operational funds for the rehabilitation and maintenance of 1,969 kms. of roads.

VII. Cross-sectoral Coordination:

The primary roads network is established to meet regional and district economic development and administrative requirements. Therefore, there is a need to ascertain whether circumstances or development initiatives will affect these priorities.

VIII. Existing Project Preparation Documentation:

This project was prepared on the basis of two studies: Road Priority Determination: Arusha Region, by Dr. Benno J. Ndulu, June 1981, and Assessment of Arusha Region Works Organization and Management, by John Morrison, Jr., October 1980.

IX. Action Required:

Development of an implementation plan which outlines equipment and spare part, training, and technical assistance requirements.

Long Term Investment Proposal

P. 4.2

- I. Project Title: Moderniz Regional Maintenance Workshop Capabilities
- II. Project Objectives:
- To upgrade the equipment maintenance facilities and capabilities of the Regional Works and six District Works Offices.
- To upgrade the skills of regional and district maintenance personnel.
- III. Project Location:
- The project will develop the capabilities of the Regional Workshop with assistance to the six district workshops to establish an integrated equipment maintenance system.
- IV. Estimated Cost: 50,000,000 T.Shs.
- V. Background and Rationale:
- One element required for economic development activities is adequate equipment and vehicle maintenance facilities. Although considerable equipment and vehicles are in Arusha Region, almost forty percent are poorly maintained.
- VI. Detailed Project Description:
- The Project will consist of the following components:
- Upgrade the facilities and equipment of the Regional Comworks Workshop to handle major equipment and vehicle overhaul and maintenance;
 - Upgrade the facilities and equipment of the six District Comworks Workshops to provide day to day maintenance of roads and other equipment and vehicles in the district; and
 - Develop a group of skilled mechanics at regional and district levels to perform the above tasks.
- VII. Cross-sectoral Coordination:
- Primary responsibility for this rests with Regional and District Comworks. However, to help insure the effective

functioning of other office equipment, there is a need to identify the load and requirements for servicing other government equipment and vehicles.

VIII. Existing Project Preparation Documentation:

Documentation for this requirement and organizational and equipment needs are identified in the study, Assessment of Arusha Region Works Organization and Management, by John Morrison, Jr., October 1980.

IX. Action Required:

Development of an implementation plan that specifies equipment orders and a training program for mechanics.

Long-Term Investment Proposal - Communications

P. 4.3

I. Project Title: Village Transport Services

II. Project Objectives:

To improve village and ward transport of local produce and other village development goods;

Through the provision of loan funding, generate additional funds for village development.

III. Project Location:

This project will serve 120 sites, either villages or wards, as determined by officials in the Region's six districts.

IV. Estimated Cost: 48,000,000 T.Shs.

V. Background and Rationale:

One critical need in the Region is improved transport facilities. This project was developed after successful experiences of providing these services at the village level, starting with a project in Arumeru District and extended on a test basis to the three Maasai districts.

VI. Detailed Project Description:

The project will consist of the following components:

- Provision of 120 lorries (20 per district) for sale to villages or wards;
- Provision of training through the Comworks Workshops for villagers in maintenance of the lorries; and
- Use of the loan funds repaid from village sales in village or ward development activities requiring local currency.

VII. Cross-sectoral Coordination:

For assistance in management and accounting, assistance will be provided by Regional and District Cooperative and Community Development Departments.

VIII. Existing Project Preparation Documentation:

A pilot project for the three Maasai districts has been developed and is being implemented on a testing basis.

IX. Action Required:

Secure funding and develop implementation plan with districts selecting sites for sales.

V. OBJECTIVE FIVE: PROVIDING ADEQUATE WATER SUPPLIES

The fifth investment objective of the Region is to establish and maintain water supply systems to promote productivity and the quality of life in villages. Access to clean water is not only critical for healthier and better living in rural villages, but also for their economic development.

5.1 Analysis of the Objective

Although progress has been made in meeting the national guideline that all villages should have a clean water supply within a distance of five kilometers, there are still 52 percent of the people of Arusha Region who do not have a reliable water supply system. Recent surveys also show that about 30 percent of the water supply systems installed have significant maintenance problems which cause regular disruption in service and pollution. Therefore, the Region has placed high priority on the maintenance of existing systems, taking steps to survey requirements in the Region and with APVDP financing to rehabilitate systems for several villages. Also, regional policy requires a shift from difficult-to-maintain systems to more appropriate technology (not requiring importation of fuel and spare parts) wherever possible. This has led the Region to establish shallow well construction teams as well as to test the greater use of water catchments and windmills.

The Region has broadened the focus of the water supply policy to emphasize the use of systems for directly productive activities. Therefore, in project development, particularly for the long-term, the economic development benefits are examined. This step requires increased integration and coordination in planning between Maji and agriculture, livestock, natural resources and rural industries. It is hoped that at the end of the implementa-

tion of the long-term plan, every village in the region will have access to safe access to water within 400 meters. This is accordance with the national policy.

5.2 The Medium-Term (Five Year) Plan

The goal of the Five Year Plan is to insure that all villages have a clean water source through the installation of new systems and the rehabilitation of existing systems. Under the Plan, one project is to do the surveying and planning work necessary for the 63 villages which do not currently have a water supply system.

The Plan calls for the installation of water supply systems for 69 villages, with natural water supplies being developed for six villages for livestock consumption. To achieve this target, one project is designed to develop piped water supply systems, taking advantage of natural water sources, or 20 villages. A second project is designed to provide 18 villages with water from deep wells and a third to provide 31 villages with water from shallow wells. The shallow wells program was initiated by the Region through APVDP which has drawn upon the Morogoro program for training and equipment. In line with regional priorities, a fourth project calls for the rehabilitation of water supply systems for 31 villages so that they receive a reliable and clean supply of water.

The cost of the projects under the medium-term plan is 37 million shillings, the bulk of which will require external funding that is not yet available. Priority Projects include:

Strengthening Water Services

8,400,000 T.Shs.

The objective of this project is to strengthen water services in the Region through training, provision of equipment and spare parts. The project involves the repair and rehabilitation of 59 existing water supply systems. Training will be

provided to village-level technicians as a continuation of the program started through APVDP.

(See Vol. 3: Five Year Development Plan, Part III, Section 3.19(1)).

Piped Water Supply Systems 15,000,000 T.Shs.

This project is designed to provide 20 villages with piped water supply systems, taking advantage of natural water sources such as springs and rivers. These systems will be gravity fed, reducing maintenance requirements.

(See Vol. 3: Five Year Development Plan, Part III, Section 3.19(3)).

Deep Well Water Supply 11,800,000 T.Shs.

In certain locations, the only reliable source of clean water for villages is from deep wells or boreholes. This project provides the digging and installation of 18 deep wells.

(See Vol. 3: Five Year Development Plan, Part III, Section 3.19(4)).

Shallow Well Water Supply 750,000 T.Shs.

Through APVDP, the Region has developed the capacity to install shallow wells. This project calls for the installation of shallow wells to serve 311 villages.

(See Vol. 3: Five Year Development Plan, Part III, Section 3.19(5)).

The above projects provide for the construction and rehabilitation of about 100 water supply systems. For purposes of securing funding, these projects can be broken into village specific projects.

5.3 Priority Long-Term Plan Projects

The Medium-Term Plan provides for the construction and rehabilitation of village water supply systems to achieve the guidelines established by the national government. The long-term projects (outlined in the annex to this section) have been developed by Maji and are major efforts proposed to serve the longer-term economic and social interests of specific geographic areas. These projects include:

P5.1 Improvement of Existing Traditional Water Sources 83.0 million Tsh.

At present there are 178 villages with a population of 312,563 people being served by unimproved water sources. Out of the 178 villages, 12 are among the villages to be served by the proposed large-scale projects. The remaining 166 villages with 294,531 people shall require improvement of the traditional water sources.

This project involves provision of water treatment facilities such as slow sand filters at dam and river sources, and protection of springs and traditional water holes against pollution, including provision of water storage facilities and kiosks.

P5.2 Distribution Pipelines 70.0 million Tsh.

While the goal of the medium-term plan is to provide at least water sources for those villages which have no water sources within 5 kilometers, in the long-term plan the goal in accordance with the national policy is to bring water supply within 400 metres. This project will involve the extension of distribution lines for 5 existing water systems and for 38 systems which have been planned to be constructed during the implementation of the medium-term plan. The project is intended to benefit 79,450 people.

P5.3 Central Kiteto Trunk Main 70,000,000 T.Shs.

This project proposes to establish a pipeline from the Ruvu River to the sub-district headquarters at Engasmet, serving nine villages with a population of 6,500 people and 63,000 livestock units. A feasibility study has been completed by Maji and the project will include 304 kilometers of pipeline, three pumping stations, a treatment plant, and three storage facilities. This project will allow the development of the central part of Kiteto District.

P5.4 Dongobesh Trunk Main 80,000,000 T.Shs.

This project proposes to establish a pipeline from the Mongahay River to serve the semi-arid southern part of Mbulu District. The pipeline will provide water to 16 villages with a population of 36,770 and half the livestock units in the area which is about 49,000. A feasibility study has been completed by Maji and the project will include 137 kilometers of pipeline, a treatment plant and one storage tank.

P5.5 Kansay-Endabash Pipeline 10,000,000 T.Shs.

This project will supply water to five villages with a population of 12,000 situated in the northern part of Mbulu District. The project includes 40 kilometers of pipeline, a treatment plant and one storage facility. The water from the River Endabash will be used for human consumption and for support of small scale industries including brick-making. The feasibility study has been completed by the Regional Water Office.

P5.6 Mto wa Mbu - Mbuyuni Trunk Main 40,000,000 T.Shs.

This project will tap water from the Oripoi spring northwest of Mto wa Mbu, supplying water to seven villages with a population of 11,700 and 51,000 livestock units. The project includes 79 kilometers of pipeline, two pumping stations, and eight storage tanks. It will cover the semi-arid area east of Mto wa Mbu in Monduli District. The feasibility study was done by H.P. Gauff Consulting Engineers and the final design has been completed.

P5.7 Monduli Town Water Supply 5,000,000 T.Shs.

This project is designed to provide adequate water supply for human consumption and small scale industries in Monduli Town. The project includes the drilling of an adequate number of boreholes (minimum of three) and the installation of a pipeline to connect the existing water supply system with the new sources of water. Hydrological surveys have been carried out by the Regional Water Office.

P5.8 Ng'arwa Wasso Water Supply 2,000,000 T.Shs.

This project is designed to provide adequate water supply for human consumption and small scale industries for the district headquarters of Ngorongoro. The water supply system will tap a spring and the project includes 13 kilometers of pipeline, one pumping station, and one storage tank. The feasibility study for this project has been done by the Regional Water Office.

Fuller details of these projects may be found in the annex to this section of the Plan.

5.4 Project Ideas to be Developed

Other projects to be developed over the next twenty years will be developed in relation to other agricultural and livestock development programs. As outlined earlier, these include:

- The Kiru Valley Irrigation and Agricultural Development Project;
- The Mang'ola-Yaeda Valley Agricultural and Livestock Development Project, including flood control and irrigation; and
- The Lake Babati Irrigation and Flood Control Project.

Long Term Investment Proposal - Water

P. 5.1

I. Project Title: Improvement of Existing Traditional Water Sources

II. Project Objectives:

To improve the existing traditional water sources in a total of 166 villages in Arusha Region with a population of 294,531 people through the provision of water treatment and storage facilities and other measures to prevent pollution.

III. Project Location:

Arusha Region, 166 villages in all six rural districts. This includes every village which must rely on a traditional water source.

IV. Estimated Cost: 83,000,000 T.Shs.

V. Background and Rationale:

At present there are 178 villages with a population of 312,563 people being served by unimproved water sources. Out of the 178 villages, 12 are among the villages to be served by the proposed large-scale projects. The remaining 166 villages with 294,531 people require improvement of the traditional water sources to make them as safe as possible. Because of the number of people involved and the impact the proposed improvements would have on the health of these people, this project is given the highest long-term priority.

VI. Detailed Project Description:

The project involves the improvement of traditional water sources in 166 villages. This involves the provision of:

- Water treatment facilities, such as slow sand filters at dam and river water sources; and
- Protection of springs and traditional water holes against pollution including provision of water storage facilities and kiosks.

The proposed improvements would benefit a total population of 294,531 people.

VII. Cross-sectoral Coordination:

Since the main objective of this project is to improve the safety and cleanliness of traditional water sources, close coordination is required with the regional medical authorities to identify the specific health hazards of the various water sources and measures that can be taken to address these hazards including a coordinated preventive health education campaign.

VIII. Existing Project Preparation Documentation:

Water Systems Inventory, Arusha Region, Regional Water Department, Arusha, September 1982.

IX. Action Required:

Detailed implementation plan indicating improvements to be made in each village, and negotiation of project funding.

Long Term Investment Proposal - Water

P. 5.2

I. Project Title: Distribution Pipelines

II. Project Objectives:

To provide a safe water supply for a total of 79,450 people through the extension of distribution pipelines for 5 existing water systems and for 38 systems which have been planned for construction during the medium-term plan. This project is in accordance with the national policy of providing a safe water supply within 400 metres of each village.

III. Project Location:

Arusha Region, five existing gravity water supply systems and 38 proposed systems spread throughout the six rural district.

IV. Estimated Cost: 70,000,000 T.Shs.

V. Background and Rationale:

While the goal of the medium-term plan is to provide at least some water source for those villages that presently have no water source within 5 kilometers, in the long-term plan the goal in accordance with the national policy is to bring water supply within 400 metres. During 1982 the Regional Water Department, Arusha, with the assistance of APVDP, concluded a detailed Water Systems Inventory of Arusha Region. The Inventory indicated major repair and maintenance problems, and specified improvements which could be made in each system, such as extensions to the distribution pipelines, to make the safe water more accessible to the people. This inventory provides the basis for the previous project in improving existing traditional water sources and for this project to extend distribution pipelines in five existing gravity water systems and in 38 gravity water systems to be constructed during the medium-term plan.

VI. Detailed Project Description:

Based on the Water Systems Inventory of Arusha Region, extensions are to be made to the distribution pipelines of:

- Five existing gravity water systems; and

- 38 gravity water systems to be constructed during the medium-term plan.

The extensions to the distribution pipelines will benefit 79,450 people.

VII. Cross-sectoral Coordination:

As a main objective of this project is to improve the accessibility to safe water supplies, close coordination is needed with the Regional medical and health authorities to improve the preventive health education activities needed for people to take full advantage of the improved water supply.

VIII. Existing Project Preparation Documentation:

Water Systems Inventory, Arusha Region, Regional Water Department, Arusha, September 1982.

IX. Action Required:

Detailed implementation plan indicating specific extensions to be made to each system, materials requirements, and construction schedule, and negotiation of project funding.

Long-Term Investment Proposal - Water

P. 5.3

I. Project Title: Central Kiteto Trunk Main

II. Project Objectives:

To supply a water supply for both human consumption and livestock to 9 villages in Central Kiteto District and to provide a water supply to the proposed new District Headquarters at Engasumet.

III. Project Location:

Kiteto District. The project area covers 14,000 sq. km. of the semi-arid central part of the district which includes the villages of Naberera, Engasumet, Kitwai A, Kitwai B, Ndedo, Makame and Ng'abolo.

IV. Estimated Cost: T.Shs. 70,000,000

V. Background and Rationale:

The project is designed to provide a piped water supply to nine villages in central Kiteto district with a present population of 6,500 and with 63,000 livestock units. The pipeline shall also provide water to the proposed new District Headquarters at Engasumet. New grazing areas shall be established, thus reducing livestock concentration around the existing water sources (mainly boreholes). The project will enable the district to implement the livestock development policy currently under preparation.

VI. Detailed Project Description:

The project includes the following components:

- 304 km. of pipeline;
- An intake structure on the Ruvu River;
- 3 pumping stations;
- A treatment plant; and
- 3 storage tanks.

The proposed capacity of the pipeline is 2,568 m³ per day of water from the Ruvu River.

VI. Cross-sectoral Coordination:

In addition to contributing to the national policy of providing safe water for human consumption, the project will make a major contribution to the implementation of the district's livestock development policy.

VIII. Existing Project Preparation Documentation:

Central Kiteto Trunk Main, Feasibility Study, Regional Water Department, Arusha, 1980.

IX. Action Required:

Negotiation of project funding, and full feasibility study and design.

Long-Term Investment Proposal - Water

P. 5.4

I. Project Title: Dongobesh Trunk Main

II. Project Objectives:

To provide a safe water supply for human consumption for 16 villages in Dongobesh Division and to provide water for livestock to support the district's livestock development policy.

III. Project Location:

Mbulu District. The project covers the semi-arid southern part of the district which includes Dongobesh, Maghang, Haydom and Yaeda Chini Wards.

IV. Estimated Cost: T.Shs. 80,000,000

V. Background and Rationale:

The project is designed to supply piped water to sixteen villages with a population of 36,770. Half of the livestock units (49,000) in the area will also be supplied water by this project. The project will enable the district to implement the livestock development policy currently under preparation.

VI. Detailed Project Description:

The project includes the following components:

- 137 km. of pipeline;
- An intake structure on the Mongahay River;
- A treatment plant; and
- One storage tank.

The project will deliver water by gravity and has a proposed capacity of the pipeline of 4,392 cubic meters per day of water from the Mongahay River.

VII. Cross-sectoral Coordination:

In addition to contributing to the national policy of providing safe water for human consumption, the project will make a major contribution to the implementation of the district's livestock development policy.

VIII. Existing Project Preparation Documentation:

Proposed Dongobesh Gravity Rural Water Supply Scheme, Arusha Regional Water Department and APVDP, December 1981.

IX. Action Required:

Detailed survey, final project design, and negotiation of funding.

Long-Term Investment Proposal - Water

P. 5.5

I. Project Title: Kansay - Endabash Pipeline

II. Project Objectives:

To provide a safe water supply for human consumption to five villages and to encourage the development of small scale industries including brick-making.

III. Project Location:

Mbulu District. The project area covers villages located 40 km. north of Mbulu, on the main District road to Karatu. Villages included are Endabash, Basodawish, Endamarariek, Getamoc and Endala.

IV. Estimated Cost: T.Shs. 10,000,000

V. Background and Rationale:

The project is designed to provide a safe water supply to five villages in north-central Mbulu with a total population of 12,000. The water supply is also intended to encourage the production of a number of small scale industries including brick-making.

VI. Detailed Project Description:

The project includes the following components:

- 40 km. of pipeline;
- An intake structure on the Endabash River;
- A treatment plant; and
- One storage tank.

The system will be a gravity system with a proposed capacity of the pipeline of 473 m³ per day of water from the Endabash River.

VII. Cross-sectoral Coordination:

In addition to contributing to the national policy of providing safe water for human consumption the project will also encourage the development of small scale industries including brick-making.

VIII. Existing Project Preparation Documentation:

Kansay-Endabash Pipeline. Feasibility Study and Survey,
Regional Water Department, Arusha, 1977.

IX. Action Required:

Final design of the project and negotiation of funding.

Long-Term Investment Proposal - Water

P. 5.6

I. Project Title: Mto wa Mbu - Mbuyuni Trunk Main

II. Project Objectives:

To provide a water supply for both human consumption and livestock to seven villages in Monduli District. The project is to provide safe water for human health and to support the district's livestock development policy.

III. Project Location:

Monduli District. The project covers the semi-arid area east of Mto wa Mbu including the following villages: Losirwa, Esilalei, Mswakini, Makuyuni, Mbuyuni Juu and Mbuyuni Chini.

IV. Estimated Cost: T.Shs. 40,000,000

V. Background and Rationale:

The project is designed to provide a piped water supply to seven villages in Monduli District with a population of 11,700 and with a livestock population of 51,000 animal units. The project will enable the district to implement the livestock development policy currently under preparation.

VI. Detailed Project Description:

The project includes the following components:

- 79 km. of pipeline;
- An intake structure at Oripoi Spring north-west of Mto wa Mbu;
- 2 pumping stations; and
- 8 storage tanks.

The proposed capacity of the pipeline is 2,950 m³ per day of water from the Oripoi Spring north-west of Mto wa Mbu.

VII. Cross-sectoral Coordination:

In addition to contributing to the national policy of providing a safe water supply for human consumption the project will make a major contribution to the implementation of the district's livestock development policy.

VIII. Existing Project Preparation Documentation:

Mto wa Mbu - Mbuyuni Trunk Main, Feasibility Report.
H.P. Gauff Consulting Engineers, 1981.

Final project design has also been completed.

IX. Action Required:

Negotiation of funds for the project.

Long-Term Investment Proposal - Water

P. 5.7

I. Project Title: Monduli Town Water Supply

II. Project Objectives:

To provide a safe and reliable water supply to the Monduli District Headquarters, Monduli Town.

III. Project Location:

Monduli Town, Monduli District Headquarters, 40 km. west of Arusha.

IV. Estimated Cost: T.Shs. 5,000,000

V. Background and Rationale:

The project is designed to provide a safe, adequate and reliable water supply to Monduli Town, the headquarters of Monduli District. The project is intended to supply adequate water for domestic uses and to encourage the development of small scale industries within the town.

VI. Detailed Project Description:

The project includes the following components:

- Drilling of an adequate number of boreholes (minimum of three) to meet the water demand of the town;
- Construction of a 5 km. pipeline to connect the new source with the existing water system; and
- Improvement of the existing distribution system.

VII. Cross-sectoral Coordination:

Implementation of this project requires coordination between the Regional Water Department and the Regional Town Planning Department which has prepared an interim land use plan for Monduli Town and is currently preparing the Regional Physical Plan. In addition to supplying water for domestic and institutional use, the project will encourage the development of small scale industries in Monduli Town.

VIII. Existing Project Preparation Documentation:

Hydrological Investigation to locate potential well field has been carried out by the Regional Water Office, Arusha. Drilling of exploratory borehole will be carried out in 1982/83.

IX. Action Required:

Drilling of the exploratory borehole to confirm the availability of water in the proposed well field.

Final project design and negotiation of funding.

Long-Term Investment Proposal - Water

P. 5.8

I. Project Title: Ng'arwa - Wasso Water Supply

II. Project Objectives:

To provide a safe, adequate, and reliable water supply to the Ngorongoro District Headquarters.

III. Project Location:

Ngorongoro District Headquarters

IV. Estimated Cost:

T.Shs. 2,000,000

V. Background and Rationale:

The project is designed to provide a safe, adequate and reliable water supply to the district headquarters of Ngorongoro District. The project is intended to supply adequate water for domestic and institutional uses and to encourage the development of small scale industries.

VI. Detailed Project Description:

The project includes the following components:

- 13 km. of pipeline;
- One pumping station;
- One storage tank; and
- Distribution system.

VII. Cross-sectoral Coordination:

In addition to supplying water for domestic and institutional use the project will encourage the development of small scale industries in the Ngorongoro District headquarters.

VIII. Existing Project Preparation Documentation:

Ng'arwa - Wasso Water Supply, Feasibility Study, Regional Water Department, Arusha, 1982.

IX. Action Required:

Final project design and negotiation of funding.

VI. OBJECTIVE SIX: INCREASING ENERGY SUPPLIES

The sixth investment objective of the Region is to increase the availability of energy supplies through the development of forestry, hydro-electrical and other resources within the Region. Currently, about 90 percent of the energy supply for Tanzania and for the Region in particular is from wood which will continue to be the major source of short-term energy until alternative sources are developed.

6.1 Analysis of the Objective

Roughly, fuel wood consumption in Arusha Region averages about 2 m³ per person per year. This suggests a consumption of 2.0 million m³ per year, plus marginal amounts for the fibreboard factory and small scale timber cutting and carpentry operations.

The Region's abundant wood resources have the potential of meeting this need with proper cultivation and conservation. In the Region, there are 24 Forest Division plantations that occupy 235,579 hectares. Assuming an offtake of 10 m³ per hectare the Region can produce 2.4 million m³ annually. Moreover, there are several village woodlots, primarily in Mbulu and Monduli Districts, and tree planting by private farmers is widespread especially in Arumeru, Mbulu, and Hanang Districts. The forestry projects of the Region through APVDP, the ILO and the national tree planting campaign have significantly increased forestry activities in the Region. Mbulu District alone, through district, ward and village nurseries, has produced almost 3.0 million seedlings in the past year to be planted by villages and farmers.

In spite of the increased awareness and forestry activity for purposes of soil conservation and fuelwood production, there are still problems such as losses at planting time and as a result of fire, grazing and unauthorized cutting on public lands. Studies indicate that sustainable wood resources development could come from better control and management of Forest Division plantations; village communal or cooperative nurseries and woodlots; a much broader approach to rural forestry, covering more varieties of trees and shrubs integrated more closely with agriculture and livestock production; greater organizational efforts to supply the fuel needs of Arusha and other large towns; and better long-term planning and management to match supplies and demands.

In addition to the long-term development of wood resources, there are several possibilities for hydro-electric projects in the Region, particularly in light of its water resources. Further, there is the possibility of solar resources which is as yet unexploited. The development of bio-gas plants for both lighting and heating at institutions such as rural health centers and post-primary technical schools should be encouraged in those areas where cow manure is readily available.

6.2 The Medium Term (Five-Year) Plan

The concentration of the Medium Term Plan is on the goals of the national forestry campaign as well as on how rural forestry can be more effectively integrated with agriculture and livestock development activities. This thrust emphasizes the development of ward and village nurseries to produce seedlings and tree planting in villages and at institutions. During the medium-term plan, targets include the planting of 18 million seedlings on 10,749 hectares of land. Main projects include:

Forest Tree Nurseries

10,700,000 T.Shs.

This project proposes to establish forest tree nurseries, primarily at the ward and village levels, to produce about 3.5 million seedlings each year. Based on the Region's experience so far through APVDP, wards and villages are receptive to this approach and the targets are achievable. (See Vol. 3: Five Year Development Plan, Part II, Section 2.25(1)).

Tree Planting

5,300,000 T.Shs.

This project is to support tree planting at the farmer, village and institutional levels. It provides for the extension and logistical support necessary to introduce forestry for purposes of fuel and soil conservation. (See Vol. 3: Five Year Development Plan, Part II, Section 2.25(2)).

6.3 Priority Long-Term Plan Projects

The main emphasis in the long-term plan is the further development of wood resources, with an aim to sustain production of fuel as the population grows as well as to use trees for soil conservation purposes in coordination with the Agriculture, Livestock and Water Offices. In addition, the plan proposes the implementation of the Hainu River Hydro-Electric Power Project. Brief project descriptions are as follows:

P6.1 Forestry Development

85,000,000 T.Shs.

This project is designed to develop sustainable production of fuelwood in the Region as well as to improve soil conservation. The project provides assistance to the forestry extension services in operations, long-term planning and management and the further development of village, forestry division, and town plantations. The main project components include:

- The development of 400 village nurseries and woodlots based on the successful model developed by the Region;
- Assistance to the forestry extension services, including the provision of training, equipment, and vehicles;

- Provision of technical assistance for purposes of resource surveys in the forestry reserves and for long-term planning so that the demand for fuel wood is met;
- The establishment and development of town forest plantations to provide a long-term fuel supply for heavily populated areas; and
- The improvement and expansion of Forest Division plantations to meet the requirements of fuelwood and industries such as fibreboard and carpentry.

P6.2 Hainu River Hydro-Electric Power Project

282,000,000 T.Shs.

This project is designed to increase the availability of energy supplies to Mbulu and Hanang Districts through the development of the hydro-electric power generation potential of the Hainu and Nambisi Rivers in Mbulu District. A Pre-feasibility Report outlines four potential development schemes, with the largest providing 23,293 gigawatt hours/year of power. Energy provided under this project would have a very significant impact on the development of small industries in the districts, with the development of agro-processing industries in turn leading to the development of the agricultural and livestock sectors.

6.4 Project Ideas to be Developed

Other project ideas to be developed which include additional means for producing sustainable energy supplies include:

- The introduction of improved methods of charcoal production, including the establishment of rural industries;
- The conducting of pre-feasibility studies for other sources of hydro-electrical power, with emphasis on small scale projects;
- The testing of solar energy systems for rural industry and other institutions such as hospitals that need a low-cost energy supply; and
- Development of bio-gas plants for both heating and lighting. The cost involved in construction of bio-gas plants ranges from T.Shs. 45,000 to 80,000, depending on

the number of families to be served. They could therefore be constructed at institutions such as rural health centers, dispensaries, post-primary technical schools and secondary schools in areas where cow manure is readily available.

Long-Term Investment Proposal - Energy

P. 6.1

I. Project Title: Forestry Development

II. Project Objectives:

This project is designed to:

- Promote village nurseries and woodlots in accordance with the national "trees for life" campaign;
- Develop a long-term planning and management capacity for supervising the development and use of the Forest Reserve plantations;
- Develop the forest resources for the supply of towns; and
- Train and equip forestry extension service staff.

III. Project Location:

The project will be regionwide, with assistance to the six districts and 400 villages within these districts. Also, major town forest resources and forest reserve plantations will be developed.

IV. Estimated Cost: 85,000,000 T.Shs.

V. Background and Rationale for the Project:

Wood resources in the Region provide the predominant source of energy. From planning documents, there is a need for a strategy that concentrates on the further development of village nurseries and woodlots, the long-term planning and improvement of forest reserves, and the establishment of town woodlots. This effort will assist with soil conservation and the provision of a sustainable energy source.

VI. Detailed Project Description:

This project is designed to:

- Develop village nurseries and woodlots. Funding is provided for 400 villages, building on the experience of the Region through APVDP and other development efforts;

- Upgrade forestry extension operations. This will be accomplished through training and the provision of vehicles and equipment;
- Conduct resource surveys and long-term planning. This component provides for detailed resource surveys of the forest division plantations and based on this analysis of the current situation and, wood energy demands in the future, the development of a plan to increase plantation production;
- Establish and improve town forest reserves. This component provides for the establishment of woodlots for Arusha and other towns to insure a long-term supply of wood resources for fuel; and
- Improve forest reserve management and output, including expansion of the plantations.

VII. Cross-sectoral Coordination:

For village nursery and woodlot development, integrated planning and coordination with Livestock and Agriculture.

VIII. Existing Project Preparation Documentation:

Detailed recommendations and justification are found in Proposals for Forestry Projects in Arusha Region, T.J. Synott, July 1981.

IX. Action Required:

Secure funding and develop detailed implementation plan.

Long-Term Investment Proposal - Energy

P. 6.2

I. Project Title: Hainu River Hydro-Electric Power Plant

II. Project Objectives:

To increase the availability of energy supplies to Mbulu and Hanang Districts through the development of the hydro-electric power generation potential of the Hainu and Nambisi Rivers in Mbulu District.

III. Project Location:

The hydro-electric power generation plant to be located at the confluence of the Hainu and Nambisi Rivers in Mbulu District where they join before flowing over the top of the Rift Escarpment.

Hydro-electric power to serve:

- Mbulu Town, Mbulu District headquarters 13 km from site;
- Babati Town, Hanang District headquarters 36 km from site; and
- Karatu Town, Mbulu District, sub-District headquarters 70 km from site;

IV. Estimated Cost:

Full Feasibility Study and Design: T.Shs. 9,500,000

Project Implementation: T.Shs. 282,000,000

The Government of Finland has expressed interest in funding the Full Feasibility Study, with full project funding dependent on the outcome.

V. Background and Rationale:

Initial investigation of the hydro-electric potential of the Hainu River dates back to 1963. Prior to the 1980 Pre-feasibility Report, reconnaissance surveys had been carried out. In 1975 the Ministry of Water, Power and Minerals established a streamflow gauging station on the Hainu River just upstream from the confluence of the Nambisi and Hainu rivers. In 1980 the Regional Hydrological Section of the

Arusha Water Department office, a TANESCO hydrologist, and the APVDP water resources engineer conducted a pre-feasibility study for the Hainu River Hydro-electric Power Project.

In investigating the many rivers and streams which flow over the Rift Escarpment, the above studies determined that the Hainu and Nambisi Rivers had the most potential for development, and were well situated in relation to Mbulu. Should the hydro-electric potential be fully developed, service could be provided to Mbulu Town, which currently has no electricity, but is scheduled to have a thermo power unit installed, Babati, the district headquarters of Hanang District, which had a thermo power generation unit installed in 1981, and Karatu, which currently has no electricity, but is a rapidly growing sub-district center.

Energy resources are essential to the further development of these centers where there is a large potential for rural industries in agro-industrial processing. The economics of the potential power market, weighed against the development and recurrent costs of hydropower generation, are the main areas needed to be addressed in a full feasibility study.

VI. Detailed Project Description:

Four alternative hydropower schemes are developed in the pre-feasibility report. The firm power generation of each of the schemes is estimated below with the assumption of run-of-the river utilization of the water resources, i.e., no storage dam provided. Should the follow-up feasibility study show storage to be economically viable, the firm power of the schemes would be increased.

The flows recorded in November 1980 are used below in the calculation of firm power noting that 1980 was a particularly dry year. Installed capacity would be approximately 10% to 40% greater than the estimated firm powers calculated below.

The four alternatives are outlined below:

Alternative A. Hainu River Scheme. An intake masonry weir is proposed slightly below the existing gauging station at a narrow portion of the river where the falls begin, with penstocks totalling 900 meters. The powerhouse would be located about 6 meters above the normal confluence water level.

Gross Head	=	100 meters
Minimum Flow	=	0.477 m ³ /sec. (measured)
Firm Energy	=	3,179 gigawatt-hours/year

Alternative B. Nambisi River Scheme. This involves a masonry intake weir approximately 15 meters in length, an open lined headrace channel of approximately 400 meters and penstocks totalling 80 meters in length.

Gross Head = 60 meters
 Minimum Flow = 0.490 m³/sec. (estimated)
 Firm Energy = 1.957 gigawatt-hours/year

Alternative C. Nambisi River diversion to Hainu River via Tunnel Scheme. Similar to the Hainu Scheme with a weir of 15 meters length and a tunnel of approximately 400 meters in length to divert water from the Nambisi to the Hainu.

Gross Head = 100 meters
 Minimum Flow = 0.900 m³/sec. (measured)
 Firm Energy = 5,992 gigawatt-hours/year

Alternative D. Downstream Confluence Scheme. This scheme takes full advantage of the flow over the Rift Escarpment. It is proposed in this scheme to construct the inlet structure approximately 50 meters downstream from the confluence of the Hainu and Nambisi Rivers. Penstocks of 2,000 meters would be required to reach the powerhouse site. Access during construction of the inlet and penstocks would be extremely rugged and require a cableway. The power house would be located below and access to it will be much easier at the base of the escarpment by road via Arusha and Babati.

Gross Head = 400 meters
 Minimum Flow = 1.0 m³/sec. (estimated)
 Firm Energy = 29,293 gigawatt-hours/year

If Scheme A or B as described above are selected then only Mbulu Town will be served, Scheme B being able to supply only 235 kilowatts of firm power. Schemes C or D could serve both Mbulu and Babati, however Scheme C providing 720 kilowatts of firm power would not supply much excess capacity for future growth. Preliminary estimates of power loss due to transmission show that, using 33 kilovolt transmission lines, less 2% of power will be lost in reaching Babati and Mbulu Towns.

VII. Cross-sectoral Coordination:

Development of the hydro-electric power supply would have a large impact on both social services (domestic uses, hospitals, etc.) and on the development of small-scale industries. As a major small industry is the processing of agricultural and livestock products, the project would also have a significant impact on these sectors.

VIII. Existing Project Preparation Documentation:

Hainu River Study Pre-Feasibility Report, Tanzania Electric Supply Company Ltd. and APVDP, December 1980.

IX. Action Required:

Negotiation of funding of full feasibility study.

VII. OBJECTIVE SEVEN: DEVELOPING DISTRICT COUNCIL AND VILLAGE CAPABILITIES

The seventh investment objective of the Region is to develop the capabilities of district councils and villages to make investments that improve self-reliance and the quality of life in villages. This involves building the planning, implementation and management capabilities of villages and cooperatives, improving health and education, and developing the government infrastructure in support of village development activities.

7.1 Analysis of the Objective

The Region through APVDP and its normal operations has concentrated on finding ways to improve village capabilities for project identification, preparation and implementation. This has included the testing of ways to increase village involvement in decision-making and management as well as their resource commitments to development activities. In addition, considerable training has been done in project development and administration through the Community Development and Cooperative Development Departments. With the changes in governmental structure, there is a need to further strengthen village planning and management capabilities and to assist in the development of local cooperatives engaged in directly productive activities.

Improved educational and health programs are ways in which the productivity and quality of life in villages can be increased. In analyzing current health and educational programs, the Region placed priority on making existing facilities operational which signals the need for greater recurrent budget support that may be accomplished through the new revenue generating mechanisms at the district level and below.

The main objective of the Ministry of Health is to improve preventive and curative health care at the village level, attempting to increase life expectancy from 51 years to 60 years by the Year 2000. Of particular importance in accomplishing this objective as well as alleviating the health constraint to improved productivity is the initiation and development of preventive health care projects.

Much progress has been made in the Region to improve education in pursuit of the goal of universal literacy. However the obstacles to achieving this goal are formidable. The educational situation is characterized by a shortage of teachers, school materials and equipment, shortages of classrooms and housing for teachers. In addition, the facilities of the technical schools are underutilized due to problems of employment.

With the devolution of resources and authority to district councils, there will be increased local control over development efforts. For district administrations to function effectively there are the needs of training, vehicles, and increased office and housing infrastructure.

7.2 The Medium-Term (Five Year) Plan

The main aim of the five year plan is to consolidate and further develop the district and village facilities and operations to improve rural quality of life. An important emphasis is the registration of villages and of cooperative societies; this effort is complemented by an intensive training program, primarily in administration and accounting, for village and cooperative society leaders. In addition, the Plan proposes investments in village or cooperative shop establishment, improvements in rural housing and development of district brigades and other rural enterprises, especially for women, to increase village revenues and organization.

The health program will improve and increase village health facilities, adding increased significance to preventive health care in accordance with Ministry guidelines. The Plan also provides for the expansion of the educational infrastructure of the Region, both for primary and adult education. Further the problems of the 15 technical schools are addressed, looking for ways this type of training can be encouraged.

With the establishment of district councils, there is a need to improve training and supporting infrastructure. This includes operational requirements of improved district offices and housing as well as training. Although housing for government workers and improved office infrastructure could be considered non-essential to village development, its importance lies with the responsibility of government to provide this infrastructure and the resulting performance through the fulfillment of these obligations.

To support educational infrastructure development in the three Maasai districts the World Bank has already begun a primary education project. Under this program educational infrastructure including 198 classrooms, 33 school stores and offices, 99 teachers' quarters and 66 school latrines will be constructed during the Fourth Five Year Plan at a cost of T.Shs. 19,693,400.

Under the medium-term plan, the priority projects for external funding include:

<u>Village and Cooperative Development</u>	5,000,000 T.Shs.
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This project involves the registration of villages and cooperative societies, the further development of village and cooperative shops, the training of village and cooperative leaders, and continued development of programs for women. Part of the operations will be carried out through the

regular recurrent budget of the Region and this project provides supplemental funding.
(See Vol. 3: Five Year Development Plan, Part IV, Section 4.15(3)).

<u>Government Housing:</u>	General	7,300,000 T.Shs.
	Education	11,700,000 T.Shs.
	Health	2,400,000 T.Shs.

This project addresses the critical housing needs of government workers to provide adequate incentives for attracting government workers, especially teachers and health personnel, to work at lower administrative levels. Testing of low cost models using soil cement will be done, with the major aim being to establish sufficient housing.
(See Vol. 3: Five Year Development Plan, Part III, Section 3.6, 3.12; Part IV, Section 4.77).

<u>Government Headquarters</u>	9,000,000 T.Shs.
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This project provides for the construction of district headquarters in Ngorongoro and Kiteto as well as a small expansion of the regional office headquarters.
(See Vol. 3: Five Year Development Plan, Part IV, Section 4.7(5)).

7.3 Priority Long-Term Plan Projects

A key to the achievement of this investment objective will be developing the financial and organizational capabilities of district councils and villages. Also, of importance will be improving villages and supporting infrastructure for improved quality of life. The main projects under this objective include:

P7.1 <u>Rural Development Fund</u>	65,000,000 T.Shs.
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This project is designed to finance directly productive village activities on a loan basis, to be repaid into a village account for making other economic and infrastructure investments. In support of this process which has proven successful under APVDP, training in accounting and administration will be provided to villages and cooperative societies by the Community Development and Cooperative Development Departments.

P7.2 Rural Housing Improvement 36,000,000 T.Shs.

A critical need of the Region is improved village housing. This project is designed to test appropriate, low cost methods of construction using local materials, the training of skilled construction workers through the Ministry of Education's technical training centers, and the provision of loan funding for housing construction through the Tanzanian Housing Authority.

P7.3 Arusha Rural Health Project 51,000,000 T.Shs.

In accordance with national policy, this project has been designed to improve village health care with an emphasis on preventive health measures. It will operate in 26 divisions, training health workers to help villages to identify and to solve health problems. In addition, it will provide funds for supporting village preventive health activities including improved nutrition, water supply and sanitation. To carry out these activities, logistical and materials support will be provided to Regional and District Health Services.

P7.4 Regional Hospital 200,000,000 T.Shs.

To serve as a center for health care operations as well as provide high quality curative health care, the Region has developed a project to construct and equip a regional hospital. This investment will provide badly needed services especially for difficult medical cases. (See Vol. 3: Five Year Development Plan, Part IX, Section 2).

7.4 Project Ideas to be Developed

The long-term viability of development efforts will depend in large part on the financial and organizational capabilities of the district councils, villages and cooperative societies. In line with this need, the Region will continue to explore the possible revenue generating powers and procedures for these local institutions, including those from service payments fees and taxes. Linked with this, there is a further need to develop the financial planning, management and administrative capabilities of these institutions.

Long-Term Investment Proposal - District and Village Development

P. 7.1

I. Project Title: Rural Development Fund

II. Projective Objectives:

The objectives of this project are twofold:

- Create a fund for financing village and cooperative development projects directed towards improving production and village infrastructure; and
- Increase the management and administrative skills of villages and cooperative societies.

III. Project Location:

This project will be carried out in the six districts of the region, with special emphasis on supporting village and cooperative initiatives.

IV. Estimated Cost:

65,000,000 T.Shs.

The project will provide 9,400,000 T.Shs. per district over a five year period, with the remaining funds used for training.

V. Background and Rationale:

The precedents for this activity are the village development activities funded by APVDP and by the Drought Relief Project. Under these projects, funds are provided on a loan basis, with repayments deposited in a village account for reinvestment. This procedure makes ongoing funds available to villages and through the process of project preparation and implementation, improves local planning and management skills.

VI. Detailed Project Description:

Under this project, a rural development fund of about 1,880,000 T.Shs. per district will be made available annually over a five year period to support, on a loan basis, directly productive or income generating activities formulated and carried out by the villages. Repayments of these loans will be made into a village account so that they can be reinvested in village infrastructure and other development activities.

The project also provides training funds for developing village accounting and administrative skills. This training will be carried out by the Community Development and Cooperative Development Departments.

VII. Cross-sectoral Coordination:

Development of village activities to be financed by the rural development fund requires close coordination with the offices responsible for Agriculture, Livestock, Natural Resources, and Rural Industries. As villages develop projects for the reinvestment of the loan payments, assistance will be required from other regional and district functional offices.

VIII. Existing Project Preparation Documentation:

The main supporting documentation for this project includes the project preparation documents for the 100 projects that have been financed by APVDP. Also, there have been evaluations of these projects incorporated in regional quarterly reports.

IX. Action Required:

On selection of a donor agency, preparation of the formal proposal.

Long-Term Investment Proposal - District and Village Development

P. 7.2

I. Project Title: Rural Housing Improvement

II. Project Objectives:

The purpose of this project is to improve the quality of rural housing in Arusha Region. More specifically, the project is designed to:

- Test alternative technologies for improved rural housing;
- Develop construction skills for village housing through improvement of the facilities of the Ministry of Education technical schools relating these skills to employment opportunities in rural housing; and
- Provide loan funding for 100 houses per district, to be reinvested in other housing development schemes.

III. Project Location:

This project will be regionwide with operation in each of the six districts. It will also involve the 15 technical training centers of the Ministry of Education.

IV. Estimated Cost: 36,000,000 T.Shs.

V. Background and Rationale:

One critical need in the Region is improved rural housing. Because of increasing costs and unavailability of building supplies, there is a need for the development of construction practices that will fully utilize local materials. In addition, there are few skilled construction workers and the technical training centers of the Region are only partially utilized because of no direct relationship between training and employment opportunities. The precedent for this project is the Kikwe Building Brigades in Arumeru District, which combined appropriate housing construction techniques, training of construction workers, and loan financing for home construction.

VI. Detailed Project Description:

This project will make use of existing institutions to develop a major low-cost housing program for rural villages. It involves the following components:

- The testing of soil cement and other low-cost construction techniques will be done by the Arusha appropriate Technology Center in cooperation with the national housing institute;
- The programs of the Ministry of Education technical training centers will be re-oriented towards the development of low-cost housing construction, with a major emphasis on relating training and employment opportunities in this field; and
- Loan funds for the construction of low-cost housing will be provided through the Tanzanian Housing Authority.

VII. Cross-sectoral Coordination:

This project involves the full cooperation of the Arusha Appropriate Technology Center, the technical training centers of the Ministry of Education, and the Tanzanian Housing Authority. Direction of the project will come from the district councils.

VIII. Existing Project Preparation Documentation:

A model for the development of this project exists with the project proposal for the Kikwe Building Brigades.

IX. Action Required:

This project requires a full feasibility study and project proposal negotiated with the participating institutions.

Long-Term Investment Proposal - District and Village Development

P. 7.3

I. Project Title: Arusha Rural Health Project

II. Project Objectives:

This project is designed to develop processes for improving rural health at the village level with a main emphasis being on preventive health care. More specifically, the project will:

- Provide training to health workers on how to help villages identify and solve health problems;
- Provide funds for village-identified health improvement projects; and
- Provide additional vehicle and material support to the Regional and District Health Services.

III. Project Location:

This is a regionwide program that will initiate activities in each of 26 Divisions.

IV. Estimated Cost: 51,000,000 T.Shs.

V. Background and Rationale:

An aim of the Region is to increase life expectancy from 51 to 60 years by the year 2000. This will involve an emphasis on preventive health care, with investments in improved water supply, nutrition, and sanitation practices. This project evolved from the Ministry of Health's current priority on preventive health care which recognizes the importance of village decision-making in regard to health care.

VI. Detailed Project Description:

This project will operate in selected villages in 26 Divisions of the Region. It involves:

- Provision of long-term supervisory and training assistance;
- The training of district and lower level health workers in the process of helping villages to identify and solve health problems;

- Provision of funds to support preventive health related activities; and
- The provision of vehicle, training and equipment support for the program.

VII. Cross-sectoral Coordination:

This project requires assistance from the Water, Agriculture and Livestock Departments to support village preventive health activities. Of particular importance are those activities providing improved water supplies and nutrition.

VIII. Existing Project Preparation Documentation:

This project is fully prepared with budget and implementation plans. It is supported by Ministry of Health guidelines, the inventory of health services in Arusha Region, and the Arusha Region Health Sector Assessment.

IX. Action Required:

Secure foreign donor funding and begin implementation.

VIII. OBJECTIVE EIGHT: SUSTAINING PRODUCTION AND DEVELOPMENT

The eighth investment objective of the Region is to improve and protect the environment of the Region for accomplishing the above objectives through the better utilization and conservation of its natural resources and through the slowing of its population growth rate. The Region's wealth and contribution to development goals lies in its natural resources which are rapidly deteriorating.

8.1 Analysis of the Objective

Over 95 percent of the Region's population is dependent on land and water resources for its survival. With the high population growth rate, there is increased competition for land from the agriculture, livestock and natural resources sectors, and from village, parastatal and national groups. Due to the population pressures on the land and the practices of these competing interests, there has been a deterioration of land quality and productivity, a trend that will continue in the future without improved management and conservation of natural resources.

In its planning and development, the Region has adopted the better management and conservation of its land and water resources as a primary development priority and goal. Steps were taken to divide the region into planning units based on the definition of 245 distinct agro-ecological zones. Further, the Region has begun integrated planning for these units, developing a village level approach to improved land use and population planning. Several village and ward pilot projects have been carried out in Gallapo, Olkokola, and Karatu as well as village seminars throughout Kiteto District.

Directly linked to these activities has been the introduction of improved soil conservation methods, including a regional training program and the establishment of a soil conservation unit in Karatu area of Mbulu District. With the support of ILO, several other conservation and forestry projects have been undertaken.

The efforts to improve land use and conservation are still in their early states. For the program to have its full impact, there is a need to develop this emphasis and district capabilities to carry it out in all directly productive activities. For areas of major erosion there is a need for well equipped soil conservation units as well as the continued development of forestry (See Objective Six). Only through these types of measures can sustainable production systems be developed.

Land competition and utilization questions are particularly important in the Ngorongoro Conservation Area due to its wildlife concentration. With assistance from the World Wildlife Fund, an integrated plan for this area has been developed which could be a prototype for other area development projects in the Region.

In addition to its emphasis on better land management and conservation, the Region has adopted a policy to slow its population growth rate which is currently 3.8 percent. Through government and party discussions at the village level, local understanding and support for this initiative has been growing.

8.2 The Medium-Term (Five Year) Plan

The major objective of the Region under the medium-term plan is to develop the land and water resources planning and management capabilities at the regional and district level. This involves strengthening the capacities of the district councils and the Region to incorporate this consideration into the preparation of

directly productive projects. Also, the Plan calls for the continued introduction and extension of soil conservation activities, including the establishment of soil and water conservation units in each of the six districts. With this foundation, it is anticipated that these priorities will be built into the projects over the next two decades. Priority projects for external funding include:

Land and Water Resources
Planning and Management

114,400,000 T.Shs.

The project involves building district and village capabilities to plan, implement and manage projects that effectively use and conserve the Region's land and water resources. It is the first component of the overall Arusha Rural Productivity Project and includes: long-term technical assistance by a Land and Water Resources Planning advisor and by Rural Development Specialists assigned to each of the six districts; intensive training in project preparation and land and water resources management, equipment and vehicles for the regional and district planning offices, operational funds, and annual allotments for each district from a Village Development Fund for directly productive activities. (See Vol. 3: Arusha Rural Productivity Project, Part V, Section 5.1).

Soil and Water Conservation Units

10,500,000 T.Shs.

The purpose of this project is to establish district soil and water conservation programs, including the development of soil and water conservation units, based on the Karatu model. Resources under this project (which is also a component of the Arusha Rural Productivity Project) will be used to equip the units, to train the units and all directly productive sector extension workers in conservation practices, and to fund village soil and water conservation initiatives. (See Vol. 3: Arusha Rural Productivity Project, Part V, Section 5.7).

Soil Conservation Operations

10,500,000 T.Shs.

The purpose of this project is to support the Regional Agriculture Office's soil conservation operations. The project provides the equipment and operational funds necessary to improve conservation of agricultural land, with a target of over 300,000 acres. (See Vol. 3: Five Year Development Plan, Part II, Section 2.17(6)).

Surveying Village Plots

2,100,000 T.Shs.

This project is designed to carry out surveys of plots in 180 villages. The project provides vehicle and operational support to the Regional Lands Office to conduct this work. (See Vol. 3: Five Year Development Plan, Part IV. Section 4.12(1)).

8.3 Priority Long-Term Plan Projects

As mentioned earlier, the emphasis of the medium-term plan is to develop regional and district capabilities to institute integrated planning based on improved use, management and conservation of soil and water resources. The long-term plan highlights specific investments which build upon the groundwork laid. Projects include:

P8.1 Karatu Soil Conservation

18,000,000 T.Shs.

This project is designed to rehabilitate 6,000 hectares of land in the severely eroded areas of Karatu Division, Mbulu District, and in the process, to provide the Region and district with the capacity to curtail and solve major soil erosion problems. It includes technical assistance and training, equipment and vehicles, ongoing data collection and analysis, and operational funds.

P8.2 Arusha Integrated Population and Family Planning Program

10,000,000 T.Shs.

With the concern about the implications of the rapid population growth in the Region, the Region has designed this integrated project to carry out activities that will alleviate this problem. Specific project components include:

- Assessment and monitoring of population growth and the resulting land pressures;
- Educational activities on the implications of population growth for village, district and regional planning;
- Assessments of the magnitude, directions, and determinants of inter- and intra-regional Migration;

- Review of present policies and procedures relating to regional, district and village regulation of Migration;
- Support for the expansion of the UMATI (National Family Planning Program) in Arusha Region;
- Support for the expansion of family planning training and service delivery programs of the Ministry of Health facilities in the Region; and
- Support for the expansion and development of family planning training and service delivery programs of private voluntary organizations in the Region.

P8.3 Ngorongoro Conservation Area Tanzania
World Heritage Site Investment Fund 10,000,000 T.Shs.

This project is designed to provide funds, equipment and expertise for conservation, preservation and development of the Ngorongoro Conservation Area as a World Heritage Site. The project is based on a management plan that addresses the needs for preserving the area as well as for village planning and development in the area.

8.4 Project Ideas to be Developed

The Region plans to build the emphasis of this objective-- better land and water resources use, management and conservation-- into all its directly productive activities. However, there are special requirements that merit study and development such as projects in the northern part of the Maasai districts to counter soil conservation problems. In addition, a priority project for development is the introduction of soil conservation measures along the Region's primary road network. There should be a conscious effort to minimize the problems faced by forestry in so far as it competes with agriculture and livestock raising. The University of Dar es Salaam's Department of Forestry at Olmotonyi should be involved in the research on how to combine agriculture, forestry and animal husbandry practices. Based on this research, the system of village afforestation could be greatly expanded.

Further, there is a need for projects similar to the one for the Ngorongoro Conservation Area where a specific geographic area is selected for the preparation of an integrated program of development. Depending on the resources available, such projects can focus on village clusters or larger natural areas of concentration. The important priority of these projects will be the development of sustainable production systems.

Long-Term Investment Proposal - Conservation

P. 8.1

I. Project Title: Karatu Soil Conservation

II. Project Objectives:

To rehabilitate, through soil conservation measures, 6,000 hectares in the severely eroded sections of Karatu Division.

To develop an ongoing data collection and analysis capability on precipitation, soil quality, erosion and fertility.

To establish the district's capability through the provision of equipment, vehicles and training to address the long-term constraint of soil erosion.

III. Project Location: Karatu Division, Mbulu District

IV. Estimated Cost: 18,000,000 T.Shs.

V. Background and Rationale:

The Region, through APVDP, has done several studies of the soil erosion problems in the Region and has found that the most severely affected area is Karatu Division with its 6 wards and 32 villages. This is a major production center for the region and country, but the increasing soil erosion will result in considerable reductions in crop yields.

The soils of the area are fertile, but vulnerable to severe erosion. This problem manifests itself in the forms of major and minor gully areas, extensive sheet and rill erosion, and overgrazed hillsides. The Region has had a soil conservation unit working in the area introducing contour plowing, better land utilization and protection of water resources. However, additional resources are required if the major problems of soil erosion are to be corrected.

VI. Detailed Project Description:

Building on the work initiated by the Region's soil conservation unit that operates in the area, this project is designed to rehabilitate about 6,000 hectares of land which are severely eroded. In the process, the project will develop the district's capabilities for curtailing and solving major soil erosion problems more specifically, the project provides for:

- Ongoing data collection on soil quality, erosion, and fertility and on precipitation as well as aerial photo coverage of major erosion areas;
- Technical assistance (short-term) and training for regional and district officials to address erosion problems;
- Equipment and vehicles for the soil conservation unit and other district offices for long-term conservation activities; and
- Operational funds for the rehabilitation of the 6,000 hectares.

VII. Cross-sectoral Coordination:

Although primary responsibility for this Project will rest with the Regional and District Agriculture Offices, there will be a need for close coordination and integration of the activities of the Livestock and Natural Resources Offices.

VIII. Existing Project Preparation Documentation:

The importance of this project was identified in a regional background paper, prepared by Dr. Rorke Bryan, University of Toronto, on Soil Degradation and Conservation in the Arusha Region, March 1980. This study was followed by a feasibility study done by Dr. Bryan, entitled Recommendations for Soil Conservation in Karatu Division, Mbulu District, Tanzania, February 1981, which provides the basis for this project proposal.

IX. Action Required:

Prepare engineering study for the areas of significant erosion and a costed implementation plan.

Long-Term Investment Proposal - Population

P. 8.2

I. Project Title: Arusha Integrated Population and Family Planning Program

II. Project Objectives:

To assist the government and people of Arusha Region to slow population growth and to influence migration patterns in ways that will contribute to social and economic development in the Region.

To develop systems for monitoring population growth and land pressures and to develop programs for raising awareness of population issues and the impact of population growth on land resources and economic development.

To support information, education and training activities on modern and traditional forms of family planning through the National Maternal and Child Health (MCH) clinics.

To improve family planning service delivery through Ministry of Health MCH clinics and Private Voluntary and Non-government clinics and programs.

III. Project Location: Arusha Region and its six rural and one urban districts

IV. Estimated Cost: 10,000,000 T.Shs.

V. Background and Rationale:

In the initial phase of developing long-term development strategies and priorities, district and regional officials in the region identified population growth and movement and the resulting land pressures as the most critical development problem in Arusha Region in the coming years.

With an estimated population growth rate of 3.8% per year, including in-migration, it is projected that the population of the Region will increase from 1,035,761 in 1981 to 1,256,036 at the end of the Five Year Plan in 1986 and to 1,923,940 by the year 2,000. Thus the population will double in just twenty years.

Land use planning activities at the village level have also led to a greatly increased awareness of the serious implications of rapid population growth in the context of limited land resources for increased productivity and sustainable development of the villages. The village land use planning approach and the district and regional planning approach have been based on an assessment of resource availability and strategies for sustainable development. These approaches have generated a broad concern for the problems of rapid population growth in Arusha Region and a strong commitment from the village to the regional level to undertaking a program of activities to slow population growth in Arusha Region and to regulate migration.

In this context the Region has recommended that programs be developed to encourage slow population growth rates and to regulate migration. (See Vol. 2, Policy 9). Specific program activities which have been recommended include: an educational campaign on the problems of population growth and the resulting land pressures; support for modern and traditional family planning, including an expansion of the UMATI (National Family Planning Program) activities in the Region, and an assessment of the magnitude and determinants of migration and of the policies and procedures through which the villages and districts can regulate migration.

VI. Detailed Project Description:

There is a growing consensus among regional, district and local officials of the serious implications that rapid population growth has for economic and social development in Arusha Region. While there is a strong appreciation of the complex social, economic and cultural factors which support high fertility, there is also a raised awareness and a firm commitment to undertake a comprehensive program of activities to address the issue of rapid population growth.

The following activities are proposed to be included in a comprehensive population program for the Region:

- A. Assessment and monitoring of population growth and the resulting land pressures:
 - Development of the present village-level collection and reporting system for population and migration data;
 - Further assessment and analysis of currently available information, including census data, to provide district-specific estimates of fertility, mortality, migration and population growth; and

- Development of a Pilot Vital Statistics Collection Project in selected wards, in conjunction with the national program.
- B. Educational activities on the implications of population growth for:
- District and regional development planning; and
 - Village-level land use planning.
- C. Assessment of the magnitude, directions, and determinants of inter- and intra-regional migration:
- Analysis of available census and survey data, especially analysis of the detailed questionnaire of the 1978 Census;
 - Analysis of data available from village reports to District and party (CCM) offices;
 - Review of previous studies and interviews with district officials to generate estimates of migration at the district and sub-district level; and
 - Study of the extent and distribution of rural-to-urban migration in Arusha Region and the growth patterns of the urban centers.
- D. Review of present policies and procedures relating to regional, district, and village regulation of migration:
- Review of present policies and procedures; and
 - Development of a plan to influence migration patterns in ways that will contribute to social and economic development in the Region.
- E. Support for the expansion of the UMATI (National Family Planning Program) in Arusha Region:
- Establishment of UMATI offices in each district headquarters;
 - Development of the UMATI resources and capabilities for follow-up to the village land use planning activities through presentations and seminars; and
 - Support for the UMATI program of district-level workshops on modern and traditional methods of family planning, for government and party (CCM) officials and other workers (UWT, the National Women's

Organization, youth organizations, etc.) who have contact at the village level. This would include Community Development and Cooperative Development Assistants, agricultural and other extension workers, and selected health cadres and teachers.

- F. Support for the expansion of family planning training and service delivery programs of Ministry of Health facilities in Arusha Region:
- Training programs;
 - Expansion of the number of MCH clinics; and
 - Development of the resources and capabilities of the MCH clinics.
- G. Support for the expansion and development of family planning training and service delivery programs of private voluntary and non-government organizations in Arusha Region.

VII. Cross-sectoral Coordination:

The slowing of population growth and the regulation of migration clearly will have a major impact on all sectors concerned with the social and economic development of the Region.

VIII. Existing Project Preparation Documentation:

Four reports have been prepared to date on population:

Population Profile of Arusha Region, Alan Johnston, January 1980.

Monitoring Population Growth in Arusha Region - Population Data Collection Systems and Suggestions for Improvement, C. Lwechungura Kamuzora, October 1981.

Assessment of Inter- and Intra-Regional Migration in Arusha Region, Wilfred Mlay, October 1981.

Population Pressure in Arumeru District: Development of Strategies and Policies for Dealing with Population Pressure in Arumeru District. (English and Swahili). Wilfred Mlay, June 1982.

IX. Action Required:

Final project design of sub-components and negotiation of funding.

Long-Term Investment Proposal - Conservation

P. 8.3

- I. Project Title: Ngorongoro Conservation Area. Tanzania
World Heritage Site Investment Fund
- II. Project Objectives:
- To provide funds, equipment and expertise for the conservation, preservation and development of the Ngorongoro Conservation Area.
- To preserve the outstanding natural heritage of the Ngorongoro Conservation Area, to develop the potential for tourism of the area, and to provide for the welfare and development of the resident pastoralists in the area.
- III. Project Location:
- Ngorongoro Conservation Area, an 8,000 sq. km. area located in Ngorongoro District.
- IV. Estimated Cost: T.Shs. 10,000,000
- V. Background and Rationale:
- The Ngorongoro Conservation Area is an 8,000 sq. km. area located within the Ngorongoro District of Arusha Region. The power and authority of the Ngorongoro Conservation Area rests in a board of directors with a chairman and conservator appointed by the President and other board members who are appointed by the Minister of Natural Resources and Tourism.
- As a cultural heritage, the area includes archaeological sites (Oldupai, Laitole) which are of outstanding universal value from historical, paleontological and anthropological points of view.
- As a natural heritage, the area contains natural features consisting of physical and biological formations which are of outstanding value from the aesthetic and scientific points of view. It is a natural site of universal value from the points of view of science, conservation, and natural beauty.
- Ngorongoro Conservation Area is also a site where the vegetation and landscape are the result of a long-term harmonious relationship between man and nature. The present population of pastoralists is about 16,000, and pastoralists have resided in the area for at least 2,000 years. The

pastoralists and their livestock are an integral part of the natural system and their development is an essential element in the development and conservation of the area.

Currently, operating funds are derived from government subventions (separate for recurrent and development expenditures) through the Ministry of Natural Resources, donations, and from revenue generated within the N.C.A., largely from tourism fees and levys. Several income generating projects such as a hotel, petrol sales, hire of vehicles, and handicrafts have attempted to raise revenues since the Ngorongoro Protection Fund was established in 1967.

VI. Detailed Project Description:

Operational funding for the Ngorongoro Conservation Area Authority has been proposed to come from four major sources.

- For conservation activities: a subvention from the Ministry of Natural Resources and Tourism as a national project;
- For community development activities: a subvention from Arusha Region as part of the Region's recurrent and development budgets;
- Internal funds from tourism revenues, etc.; and
- International funds.

The Ngorongoro Conservation Area has been proposed and approved as both a "Man and the Biosphere Reserve" and a "World Heritage Site" under two programs sponsored by UNESCO. The role of ngorongoro as an international heritage entails dual responsibilities: on the part of Tanzania for caring for Ngorongoro on behalf of the world community, and of the world community in assisting Tanzania with the provision of funds, equipment and expertise.

Foreign funds from the UNESCO programmes and other world organizations such as the World Wildlife Fund are proposed for the creation of a Tanzania World Heritage Site Investment Fund. An initial fund input of T.Shs. 10,000,000 (approx. U.S. \$1 million) would provide an annual income of close to T.Shs. 1,000,000 in foreign exchange. This would be used for:

- Vehicles;
- Construction of buildings (mainly outside the Ngorongoro Conservation Area, to reduce development within the N.C.A.);

- Equipment purchase and spares;
- Research; and
- Publicity and promotion.

VII. Cross-sectoral Coordination:

Conservation and development of the Ngorongoro Conservation Area involves both tourism development and social and economic development of the resident pastoralists affecting all sectors particularly livestock development.

VIII. Existing Project Preparation Documentation:

A Revised Development and Management Plan for the Ngorongoro Conservation Area (under preparation), Ngorongoro Conservation Area Authority and the Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam, 1982.

IX. Action Required:

Board, ministerial and regional approval of the above Development and Management Plan, and negotiation of funding.

IX. REGIONAL URBAN PLANNING

The focus of the Arusha Region Long-Term Development Plan has been on integrated rural development, the foundation of economic and social development in the Region. Development of the urban settlements in the Region, however, is an integral part of overall regional development. The urban settlements serve not only as centers for service delivery and administration, but also as distribution points for essential agricultural inputs and as major centers for the development of large and small scale industries based on the agricultural, livestock and natural resources of the region.

Responsibility for urban planning rests with the Regional Town Planning Department and the Arusha Municipal Planning Office. The following documents should be referred to for information on the long-term development plans for Arusha Town and the other urban settlements in Arusha Region.

- A. Master Plan for Arusha District, Tanzania. Marshall Macklin Monaghan Limited and Associate Consultant J. Leaning. Prepared for the Canadian International Development Agency, Ottawa, Canada, September, 1977.

Documents related to the Master Plan:

- I. The Twenty Year Master Plan
- II. The Five Year Development Plan
- III. The Water Supply Master Plan
- IV. The Sanitary Sewage Master Plan

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- V. The Solid Waste Master Plan
- VI. The Storm Drainage Master Plan
- VII. The Electrical Supply Master Plan
- VIII. Technical Appendix
 - i. Land Use
 - ii. Transportation
 - iii. Parks and Open Space
 - iv. Hydrogeological Investigation for Water Supply
- IX. Background Papers
 - i. Transportation Planning
 - ii. Land Use Planning
 - iii. Public Administration and Economic Overview
- B. Interim Land Use Plans. The Regional Town Planning Office and the Ministry of Lands, Housing and Urban Development are responsible for the preparation of interim land use plans for all small towns in the Region, including district headquarters, sub-District headquarters, minor settlements and small towns.

To date, interim land use plans have been prepared for the following urban settlements in Arusha Region: Babati, Monduli, Mbulu, Karatu, Namanga, and Kibaya.

X. CONCLUSIONS

The Long-Term Plan of Arusha Region outlined above highlights priority projects for external funding, including those in support of the five-year plan and those prepared and to be developed over the next twenty years. The projects under the Medium-Term or Five Year Plan are critical for laying the groundwork for long-term investment in the Region. The emphasis of these projects is to make better use of existing resources, both natural and government, taking account of the national economic constraints which will limit the availability of funding. The projects require about 422.3 million shillings.

Projects for the next two decades have been prepared looking at the long-term potential of the Region and the implementation capabilities of the Region as evidenced by lessons learned and knowledge gained over the past three years. The investment package developed is 5,655.4 million shillings, with a heavy concentration on directly productive activities (agriculture, livestock, natural resources, and rural industries) and the supporting infrastructure for these projects. The long-term project total is high due to the inclusion of the 3,000.0 million T.Shs. investment in soda ash production at Lake Natron which represents the exploitation of a unique regional asset. Under the plan, the costs for social service infrastructure are low, but the Region believes that these resources can be generated if the organizational and financial capabilities of district councils and villages are first developed. Underlying the projects for both the medium-term and long-term plans is a major emphasis on the development of sustainable production systems which will be the key to the long-term development of the Regions.

A breakout of investments by objective and by sector and project in millions of Tanzanian shillings follows:

T.1 LONG-TERM PLAN INVESTMENT PROPOSALS: SUMMARY BY OBJECTIVE
(millions of T.Shs.)

Objective One

Increase food crop supplies to feed adequately the growing population of Arusha Region, and to continue to provide a surplus for national consumption in a self-sustaining way.

Medium-Term Plan

79.5

Long-Term Plan

559.0

Objective Two

Develop the livestock industry for local and national consumption and export.

Medium-Term Plan

52.5

Long-Term Plan

425.0

Objective Three

Generate revenue, including foreign exchange, and employment through export crops, tourism, and industries that add value to the Region's natural resources.

Medium-Term Plan

20.6

Long-Term Plan

3160.0

Objective Four

Develop and maintain a communications network that contributes to economic development.

Medium-Term Plan

44.8

Long-Term Plan

394.4

Objective Five

Establish and maintain water supply systems to promote productivity and the quality of life in rural villages.

Medium-Term Plan

36.0

Long-Term Plan

360.0

Objective Six

Increase the availability of energy supplies through the development of forestry, hydroelectric, and other resources.

Medium-Term Plan

16.0

Long-Term Plan

367.0

Objective Seven

Develop the capabilities of district councils and villages to make investments that improve self-reliance and the quality of life in villages.

Medium-Term Plan

35.4

Long-Term Plan

352.0

Objective Eight

Improve and protect the environment of the Region for accomplishing the above objectives through the better use conservation of its natural resources and the slowing of population growth rates.

Medium-Term Plan

137.5

Long-Term Plan

38.0

TOTALS: Medium-Term Plan

422.3

Long-Term Plan

5655.4

T.2 LONG-TERM PLAN INVESTMENT PROPOSALS: SECTOR SUMMARY

<u>Sector</u>	<u>Medium-Term Plan</u>	<u>Long-Term Plan</u>
	(millions of T.Shs.)	
AGRICULTURE	100.5	577.0
LIVESTOCK	52.5	425.0
RURAL INDUSTRIES	20.6	3,130.0
NATURAL RESOURCES	16.0	115.0
WORKS	55.4	346.4
WATER	36.0	360.0
LANDS	2.1	--
HEALTH	2.4	251.0
EDUCATION	11.7	--
COOPERATIVES	5.0	48.0
COMMUNITY DEVELOPMENT	--	36.0
PLANNING	120.1	75.0
TANESCO	--	282.0
NGORONGORO CONSERVATION AREA	--	10.0
	420.0	5,502.4
TOTALS:		

T.3 LONG-TERM PLAN INVESTMENT PROPOSALS: BY SECTOR

<u>Project (Objective)</u>	<u>T.Shs.</u> <u>(in Millions)</u>
● AGRICULTURE	
<u>Medium-Term Plan</u>	
Pl.1 Adaptive Research (1)	12.
Extension and Information (1)	10.5
Irrigation Development (1)	38.8
Pl.1 Agriculture Workshop and Farm Service Centers (1)	17.7
Soil and Water Conservation Units (8)	10.5
Soil Conservation Operations (8)	10.5
	<hr/>
TOTAL:	100.5
	<hr/>
<u>Long-Term Plan</u>	
Pl.2 Kiru Valley Irrigation and Agricultural Development (1)	278.0
Pl.3 Mang'ola Irrigation/Flood Control and Agricultural Development (1)	240.0
Pl.4 Mbuguni-Moshono Irrigation and Flood Control (1)	35.0
Pl.5 Lake Babati Irrigation and Flood Control (1)	6.0
Pl.6 Karatu Soil Conservation (8)	18.0
	<hr/>
TOTAL:	577.0
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● LIVESTOCK	
<u>Medium-Term Plan</u>	
Extension Training and Operations (2)	16.4
Veterinary Medicine (2)	3.5
Range Workshops (2)	8.2
Maasai Construction Brigades (2)	11.0
Water Resources Development (2)	8.4
Tsetse Fly Eradication (2)	5.0
	<hr/>
TOTAL:	52.5
	<hr/>

Long-Term Plan

P2.1	Regional Range and Dairy Development Program (2)	53.8
P2.2	Arusha Agro-Industrial Project (2)	371.2
		<hr/>
TOTAL:		425.0
		<hr/>

● RURAL INDUSTRIES

Medium-Term Plan

	Rural Industries Development (3)	20.6
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TOTAL:		20.6
		<hr/>

Long-Term Plan

P3.1	Vegetable and Fruit Canning and Processing Industry (3)	10.0
P3.2	Lime Pozzolana Cement Production (3)	30.0
P3.3	Salt Extraction and Processing - Lake Balangida (3)	10.0
P3.4	Soda Ash Production - Lake Natron (3)	3,000.0
P3.5	Private Sector Tourism Development (3)	80.0
		<hr/>
TOTAL:		3,130.0
		<hr/>

● NATURAL RESOURCES

Medium-Term Plan

	Forest Tree Nurseries (6)	10.7
	Tree Planting (6)	5.3
		<hr/>
TOTAL:		16.0
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Long-Term Plan

P6.1	Forestry Development (6)	85.0
P3.6	Wildlife Utilization Project (3)	30.0

TOTAL:	115.0
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● WORKS

Medium-Term Plan

Road Rehabilitation (4)	23.5
Bridge Rehabilitation and Construction (4)	13.6
Comworks Maintenance Shops (4)	2.0
Government Housing - General (7)	7.3
Government Headquarters (7)	9.0

TOTAL:	55.4
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Long-Term Plan

P4.1	Upgrading the Region's Primary Roads Network (4)	296.4
P4.2	Modernizing the Regional Maintenance Workshop Capabilities (4)	50.0

TOTAL:	346.4
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● WATER

Medium-Term Plan

Strengthening Water Services (5)	8.4
Piped Water Supply Systems (5)	15.0
Deep Well Water Supply (5)	11.8
Shallow Well Water Supply (5)	.8

TOTAL:	36.0
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Long-Term Plan

P5.1	Improvement of Existing Traditional Water Resources	83.0
P5.2	Distribution Pipelines	70.0
P5.3	Central Kiteto Trunk Main (5)	70.0
P5.4	Dongobesh Trunk Main (5)	80.0
P5.5	Kansay-Endabash Pipeline (5)	10.0
P5.6	Mto wa Mbu-Mbuyuni Trunk Main (5)	40.0
P5.7	Monduli Town Water Supply (5)	5.0
P5.8	Ng'arwa Wasso Water Supply (5)	2.0

TOTAL: 360.0

● LANDS

Medium-Term Plan

Surveying Village Plots (8)	2.1
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TOTAL: 2.1

● HEALTH

Medium-Term Plan

Housing for Health Workers (7)	2.4
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TOTAL: 2.4

Long-Term Plan

P7.3	Arusha Rural Health Project (7)	51.0
P7.4	Regional Hospital (7)	200.0

TOTAL: 251.0

- EDUCATION

- Medium-Term Plan

Housing for Education Workers (7)	11.7
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TOTAL:	11.7
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- COOPERATIVES

- Medium-Term Plan

Village and Cooperative Development (7)	5.0
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TOTAL:	5.0
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- Long-Term Plan

P4.3 Village Transport Services (4)	48.0
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TOTAL:	48.0
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- COMMUNITY DEVELOPMENT

- Long-Term Plan

P7.2 Rural Housing Improvement (7)	36.0
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TOTAL:	36.0
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- PLANNING

- Medium-Term Plan

Land and Water Resources Planning and Management (8)	114.4
Radio Communications Network (4)	5.7

TOTAL:	120.1
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Long-Term Plan

P7.1	Rural Development Fund (7)	65.0
P8.2	Arusha Integrated Population and Family Planning Program (8)	10.0

TOTAL:	75.0
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● TANESCO

Long-Term Plan

P6.2	Hainu River Hydro Electric Power (6)	282.0
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TOTAL:	282.0
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● NGORONGORO CONSERVATION AREA

Long-Term Plan

P8.3	Ngorongoro Conservation Area Tanzania World Heritage Site Investment Fund (8)	10.0
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TOTAL:	10.0
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ANNEX A
ARUSHA PLANNING AND VILLAGE DEVELOPMENT
PROJECT DOCUMENTATION

ANNEX A

**ARUSHA PLANNING AND VILLAGE DEVELOPMENT
PROJECT DOCUMENTATION**

GENERAL OUTLINE

1. APVDP Annual Plans
2. Arusha Region Integrated Development Plan
3. APVDP Progress Reports
4. Issue Papers
 - A) Agriculture
 - B) Financial Resources
 - C) Health
 - D) Land Use and Conservation
 - E) Livestock
 - F) Manpower
 - G) Natural Resources
 - H) Population
 - I) Small Industries
 - J) Transportation/Works
 - K) Water
 - L) Wildlife and Tourism
5. Issue Paper Summaries
6. Regional Sector Papers
7. General Policy Papers
8. Evaluation Papers
9. District Strategy and Priority Papers
10. Seminars, Planning Workshops, Planning Committee Meetings
11. Regional and District Project Profiles

1. APVDP ANNUAL PLANS

- a) First Annual Plan, July 1979-June 1980.
- b) Second Annual Plan, July 1980-June 1981.
- c) Third Annual Plan Submission, July 1981-June 1982.
(Supplement to the Arusha Regional 1981/82 Annual Plan Submission.)
- d) Fourth Annual Plan, 1982/83. (Also included in Regional Annual Development Plan 1982/83.)

2. ARUSHA REGIONAL INTEGRATED DEVELOPMENT PLAN

- a) Summary Report: Arusha Region Integrated Development Plan
- b) Volume One: Arusha Region Today: 1981.
- c) Volume Two: Arusha Region: Development Strategies and Priorities for the Next 20 Years.
- d) Volume Three: Arusha Region: Medium-Term Plan 1981/82-1985/86.
- e) Volume Four: Major Areas for Long-Term Investments.
- f) Volume Five: Information Strategy and Documentation.

3. APVDP PROGRESS REPORTS

- a) First and Second Quarter Progress Report, July-December 1979.
- b) Third Quarter Progress Report, January-March 1980.
- c) Fourth Quarter Progress Report, April-June 1980.
- d) Fifth Quarter Progress Report, July-September 1980.
- e) Sixth Quarter Progress Report, October-December 1980.
- f) Seventh Quarter Progress Report, July-September 1981.
- g) Eighth Quarter Progress Report, April-June 1981.
- h) Ninth Quarter Progress Report, July-September 1981.

- i) Tenth Quarter Progress Report, October-December 1981.
- j) Eleventh Quarter Progress Report, January-March 1982.
- k) Twelfth Quarter Progress Report, April-June 1982.
- l) Thirteenth Quarter Progress Report, July-September 1982.
- m) Fourteenth Quarter Progress Report, October-December 1982.

4. ISSUE PAPERS

A. Agriculture

- 1) Arusha Region Agricultural Review -- Donald Humpal, May 1980.
- 2) Agricultural and Livestock Production in Arusha Region: An Agricultural Economic Perspective - Merritt Sargent, October 1980.
- 3) Regional Agricultural and Livestock Activities in Relation to Arusha Region Development Objectives: Summary Papers - Ian Walton, September 1980.
- 4) Back to Basics, Some Thoughts Concerning the Agricultural Sector in Arusha Region - Robert Dodd, November 1981.
- 5) Extension Agent's Field Guide - Robert Dodd and Beth Jackson, February 1982.
- 6) Muongozo wa Kilimo cha Mazao Mbali Mbali (Guidelines for Various Agricultural Crops), 15 crops (Swahili) - P.N. Msabaha, Hanang Ag. Extension Program and Regional Resource Centre, June 1982.
- 7) Developing Irrigation in Arusha Region Tanzania - Bishay G. Bishay, May 1982.
- 8) Strengthening Arusha Region Extension Services in the Productive Sectors - Bruce Lundeen, August 1982.
- 9) A Four Week In-Service Training Program in Agricultural Irrigation and Drainage, Arusha, Tanzania - Bishay G. Bishay, August 1982.

B. Financial Resources

- 1) Financial Resources Available for the Development of the Arusha Region: A Look into the Future -- Elliott Morss, May 1980.
- 2) Kitabu cha Mikopo na Misaada Vijijini (Village Loan and Grant Guidebook) (Swahili) -- Arumeru District Development Office, July 1980.
- 3) An Assessment of the Revenue Generation Capabilities of Villages, Districts and Arusha Region: Some Policy Options -- Larry Schroeder, Local Revenue Administration Project, Syracuse University, June 1981.
- 4) The Financial Infrastructure in Tanzania, Perspectives, Problems and Policy Strategies with Policy and Program Implications for Arusha Region -- M. S. D. Bagachwa, Economic Research Bureau University of Dar es Salaam, June 1981.

C. Health

- 1) A Survey of the Health Service in Arusha Region-- Edith Alger, May 1980.
- 2) APVDP Health Component -- Stan Yoder, September 1980.
- 3) Health Sector Assessment -- Stan Yoder, October 1980.
- 4) Education and Training for Health Planning in the Arusha Region, Tanzania (with abstract) -- Paul Chikira, August 1981 (Cornell University thesis).

D. Land Use and Conservation

- 1) Four Discussion Papers -- Henry Fosbrooke
 - i. Land Tenure and Land Use
 - ii. Farming Systems
 - iii. Urban Development and the Growth of Communications
 - iv. Resource Conservation
- 2) Soil Degradation and Conservation in the Arusha Region -- Rorke Bryan, March 1980.
- 3) Information for Rural Land Planning in Arusha Region -- Dunford, Mouat, Slaymaker, June 1980.

- 4) Livestock, Wildlife and Land Use Survey: Arusha Region -- Tanzania. Final Report. Volume I: Text. Ecosystems Ltd., September 1980.
- 5) Livestock, Wildlife and Land Use Survey: Arusha Region, Tanzania. Final Report. Volume 2: Figures and Tables. Ecosystems Ltd., September 1980.
- 6) Land Resource Survey & Planning -- Arusha Region, Tanzania -- Christopher Dunford, Land Resource Surveys, 1980.
- 7) Land Information Materials Available to Arusha Planning and Village Development Project -- Christine Dodson, December 1980.
- 8) Proposed Land Planning Units for Arusha Region, Tanzania -- Christopher Dunford, December 1980.
- 9) Recommendations for Soil Conservation in Karatu Division, Mbulu District, Tanzania -- Rorke Bryan, February 1981. (English and Swahili.)
- 10) Change in Cultivated Areas and Erosion Gullies in Northern Mbulu District, Tanzania 1958 to 1972 -- Christopher Dunford, May 1981.
- 11) Promotion of Land Use Planning in Arusha Region -- Francis G. Finda, June 1981.
- 12) AP/VDP Soil Conservation Workshop -- Summary and Conclusions -- Rorke Bryan and Tom Dunne, June 1981.

E. Livestock

- 1) The Livestock Sector in Arusha - Ian C. Walton, December 1980.
- 2) Masai Motivation and its Application - Henry Fosbrooke, March 1980.
- 3) Masai Motivation and its Application Annexure II The Masai Gift Scheme, 1940-1944 - Henry Fosbrooke, March 1980.
- 4) Tsetse Clearing in Mbulu District, 1936-1953 - Henry Fosbrooke, March 1980.
- 5) Assessment of the Arusha Livestock Situation and Recommendations for Use in the Arusha Region, 1980-1985 Livestock Plan - M. Jacob, Dr. J. Melewas, and G. Sumari, April 1980.

- 6) Range Management in Arusha Region: Discussion Paper - David Peterson and Thad Peterson, July 1980.
- 7) Livestock Leaflets, 20 subjects (Swahili) - Ofisi ya Maendeleo ya Mifugo (Livestock Development Office), June 1982.

F. Manpower

- 1) A Profile and Analysis of Government Manpower in Arusha Region -- Liz Wily, October 1980.
- 2) General Conclusions and Recommendations of A Profile and Analysis of Government Manpower in Arusha Region -- Liz Wily, October 1980.

G. Natural Resources

- 1) Agro-Forestry and Its Relevance to the Arusha Region -- Henry Fosbrooke, March 1980.
- 2) Fisheries in Arusha Region, Tanzania -- Phoenix Development Services Ltd., May 1980.
- 3) Forestry in Arusha Region -- T.J. Synott, July 1980.
- 4) Beekeeping in Arusha Region -- Christopher Dunford, July 1980.
- 5) Pre-feasibility Assessment of Geothermal Resources in Northern Tanzania -- Kathleen Crane, Lament-Doherty Geological Observatory, Palisades, New York.
- 6) Notes on Forestry in Hanang -- T. J. Synott, June 1981.
- 7) Proposals for Forestry Projects in Arusha Region -- T. J. Synott, July 1981.

H. Population

- 1) Population Profile of Arusha Region -- Alan Johnston, January 1980.
- 2) Monitoring Population Growth in Arusha Region -- Population Data Collection Systems and Suggestions for Improvement -- C. Lwechungura Kamuzola, Department of Statistics, University of Dar es Salaam, October 1981.
- 3) Assessment of Inter- and Intra-Regional Migration in Arusha Region -- Wilfred Mlay, Department of Geography, University of Dar es Salaam, October 1981.

- 4) Population Pressure in Arumeru District: Development of Strategies and Policies for Dealing with Population Pressure in Arumeru District -- W. F. I. Mlay, Department of Geography, University of Dar es Salaam, June 1982. (English and Swahili.)
- I. Small Industries (Community Development and Cooperatives Development)
- 1) APVDP Discussion Paper: A Possible APVDP Strategy for Small Industries/Appropriate Technology Activity in Arusha Region -- Hugh Allen, October 1979.
 - 2) The Urban Informal Enterprise Sector in Arusha Region -- M. S. D. Bagachwa and S. S. A. Ngware, University of Dar es Salaam, January 1981.
 - 3) Formal Private Industry in the Arusha Region: A Survey -- Peter Schaefer, March 1980.
 - 4) The Availability and Distribution of Selected Building Materials in Arusha Region -- W. E. Maro, Economics Research Bureau, University of Dar es Salaam, August 1981.
 - 5) Formal Industries in Arusha Town (Inventory.)
 - 6) Formal and Informal in Rural Arusha Region (Inventory.)
 - 7) Agricultural Implements Factory at Njiro Hill Arusha, Project Report for APVDP - SIDO Arusha, September 1981.
 - 8) The Spider Tractor in Tanzania - John Kilgour, C.R. Crossley, National College of Agricultural Engineering, Cranfield Institute of Technology, Silsoe, England, October 1982.
 - 9) Prefeasibility Study on Brick and Tile Making for Village Development Project - Ajit Pal Singh, November 1980.
- J. Transportation/Works
- 1) Planning Roads for the Arusha Region -- Edward Holland, January 1980.
 - 2) Transportation in Arusha Region -- Edward Holland, January 1980.

- 3) Problems of Agricultural Transportation in Rural Areas (A Case Study of Seven Villages in Mbulu District) -- W. E. Maro, Economic Research Bureau, University of Dar es Salaam, June 1980.
- 4) Arusha Regional Transport Planning Project (Road Transport Infrastructure) Study -- Dr. Benno J. Ndulu, Department of Economics, University of Dar es Salaam, June 1980.
- 5) Regional Works Issues for Discussion -- John Morrison, October 1980.
- 6) Assessment of Arusha Region Works Organization and Management -- John Morrison, October 1980.
- 7) Road Priority Determination: Arusha Region -- Dr. Benno J. Ndulu, Department of Economics, University of Dar es Salaam, June 1981.
- 8) Rural Road Planning: A Training Program for District Engineers in Arusha Region, Tanzania -- Castor Tingirawanyuma, May 1982 (Cornell University thesis.)

K. Water

- 1) Hainu River Study Pre-feasibility Report (TANESCO) -- M. Katyesa and J. Gadek, December 1980.
- 2) Hydrogeological Investigation Report for Olkokola Borehole -- K. Roy, Regional Hydrogeologist, November 1980.
- 3) Hydrogeological Investigation Report for Kikatiti Borehole -- K. Roy, Regional Hydrogeologist, March 1981.
- 4) Preliminary Investigation Report for Dongobesh Gravity Water Supply -- J. Gadek, March 1981.
- 5) Planning for Operation and Maintenance of Rural Water Supply Systems in Tanzania: Arusha Region Case Study (Cornell University thesis) - Gwabe M. Khawange, August 1982.

L. Wildlife and Tourism

- 1) Sector Assessment of Tourism in the Arusha Region of Tanzania -- Victoria Morss, May 1980.
- 2) The Status and Utilization of Wildlife in Arusha Region, Tanzania, Final Report. Ecosystems Ltd., September 1980.

5. ISSUE PAPER SUMMARIES (ENGLISH AND SWAHILI)

- A. Agriculture
- B. Beekeeping
- C. Financial Resources
- D. Fisheries
- E. Forestry
- F. Health
- G. Implementation of Development Initiatives
- H. Land Use and Conservation
- I. Livestock
- J. Manpower
- K. Population
- L. Small Industries
- M. Transportation
- N. Water
- O. Wildlife and Tourism

6. REGIONAL SECTOR PAPERS: SUMMARY OF THE CURRENT STATUS, CONSTRAINTS, AND PRIORITIES FOR FUTURE DEVELOPMENT - Regional and Functional Offices, December 1980.

- A. Agriculture
- B. Education
- C. Land Development
- D. Livestock
- E. Natural Resources
- F. Small Industries
- G. Stores
- H. Ujamaa and Cooperatives
- I. Water
- J. Works

7. GENERAL POLICY PAPERS

- a) APVDP Policy Paper
- b) Village Development Activities, Arusha Planning and Village Development Project, March 1981.
- c) Information Activities of the APVDP: Present and Future Potentials -- Elliott Morss, March 1980.
- d) A Case for Regionally Integrated Planning -- Elliott Morss, March 1980.

- e) Integrating Regional Development Objectives into the Regional Planning Process -- Elliott Morss.
- f) Regional Development Planning: A Critical Assessment of the Tanzania Experience and its Implications for the Arusha Planning Process -- Elliott Morss, August 1979.
- g) Center and Periphery in Arusha Region: Institutional Capacities and Development Initiatives in the Context of Existing Governmental Structures and Village Organization -- Garry Thomas, November 1980.
- h) The Village Profile Exercise: APVDP Background Information, Impressions and Perceptions -- David Peterson and Thad Peterson, June 1980.
- i) The Village Profile Exercises: Codes for Information Held in Computer Files -- T. M. B. Chikoti, February 1982.
- j) English translation of the Guidelines for Preparing the Union Five-Year Plan 1981/82-1985/86.
- k) English translation of Guidelines for the Preparation of the Regional Estimates for the 1981/82 Financial Year.
- l) Cross-Cutting Issues Emerging from the Arusha Regional Planning Exercise -- Elliott Morss, November 1980.
- m) Summary Strategy Paper.
- n) Arusha Regional Planning Exercise: Decisions for the Future, January 1981.
- o) Women and Development: A Case Study of Ten Tanzanian Villages -- Liz Wily, March 1981. (Summary in English and Swahili.)
- p) Encouraging Village Self-Reliance in Arumeru District, Tanzania -- Joyce Stanley, June 1981.
- q) APVDP Briefing Paper -- July 1981.
- r) Fuel Availability and Distribution in Arusha Region -- W. E. Maro, Economic Research Bureau, University of Dar es Salaam, August 1981.
- s) Integrated Rural Development Planning through the Decentralized System: Shortcomings and Prospects. The Tanzanian Experience with the Arusha Region as a Case Study -- Mbwiga Mwalende, May 1982 (Cornell University thesis.)

- t) Proposed Implementation Plan for APVDP Projects 1982/83 -- APVDP, May 1982.
- u) Regional Planning Model for Arusha, Tanzania -- R. Scott Moreland, International Population and Development Planning Project, Research Triangle Institute, North Carolina, August 1982.

8. EVALUATION PAPERS

- a) Evaluation of the Third Five Plan (1976-1981) Arusha Region -- Institute of Development Studies, University of Dar es Salaam, April 1980.
- b) English translation of Dutch Evaluation Visit to Arusha Planning Village Development Project, March 1981.
- c) Report on the Evaluation Visit to the APVDP Graduate Training Program in Regional Planning at Cornell University, February 1981.
- d) Kikwe Building Brigade Evaluation, December 1980.
- e) Joint USAID/Government of Tanzania Evaluation of AP/VDP, June 1981.
- f) A Preliminary Investigation into the Potential for Agricultural Production from the Kiru Valley Area of Hanang -- I. Walton, J. Gadek, & D. R. R. Mabugo, June 1981.
- g) Evaluation of the APVDP Shallow Wells Program in Hanang District, October 1981.
- h) Evaluation of the Gallapo Dairy Multiplication Unit in Hanang District, November 1981.
- i) Land Use Planning Activities in Arusha Region, Report and Recommendations -- The Regional Development Directorate, Arusha, April 1982.
- j) Evaluation of the Computer Operations of the Regional Planning Office, Arusha Region: Report and Recommendations - Regional Planning Office, Arusha, August 1982.

9. DISTRICT STRATEGY AND PRIORITY PAPERS

- a) Arumeru District Strategy for Planning 1981/82 Future 5 and 20 Years, December 1980.

- b) Hanang District Long Term Development Strategy, December 1980.
 - c) Kiteto District Development Planning Framework for 1981/82 and the Future 5 and 20 years. Issues, Strategy and Supporting Action - Area Commissioner's Office, January 1981.
 - d) Mbulu District's Development Issues and Strategies - District Planning Committee, January 1981.
 - e) Monduli District Development Issues, Strategies and Actions for the next 5 to 20 Years - Area Commissioner's Office, January 1981.
 - f) Ngorongoro District Long Term Development Strategies and Supporting Issues.
10. SEMINARS, PLANNING WORKSHOPS, PLANNING COMMITTEE MEETINGS
- a) Seminar on Data Analysis and Development Planning Report - Lewis, Brandford, Jones, August 1980.
 - b) Workshop on RIDEP/Arusha, September 1979.
 - c) Manyara Workshop Papers, October 1979.
 - d) Ngorongoro District Planning Workshop Report - Neal Cohen, January 1980.
 - e) Maoni na Maelekeo yaliotokana na kukusanya Takwimu na Maarifa Kutoka Vijiji vya Wilaya ya Kiteto (Kiteto District Planning Workshop Report) - D. Peterson and T. Peterson, February 1980. (In Swahili).
 - f) Minutes of Regional Planning Committee Meeting, 9-11 February 1981. (English and Swahili).
 - g) Report of a Study Tour Undertaken by Arusha Regional Team in Botswana, February 25-March 14, 1981.

11. REGIONAL AND DISTRICT PROJECT PROFILES

A. Regional Projects

<u>Project Number</u>	<u>District</u>	<u>Project Name</u>
1	Region	Regional Planning Activities

2	Region	Facilitator Training Model Seminar
3	Region	Workshop on Data Analysis and Planning
4	Region	Graduate Training program /Regional Planning
5	Region	Themí Farm Implement Company
6	Region	Improvement of Regional Veterinary Services
7	Region	Procurement of 35 Landrovers
8	Region	Procurement of 10 Isuzu Lorries
9	Region	Procurement of 120 Motorcycles
10	Region	Regional Well Drilling Equipment Spare Parts
11	Region	Construction of Regional Warehouse/Garage
12	Region	AATP Technical Development Project
13	Region	Spider Tractor Testing Program
14	Region	Agricultural Implements Research/Development
15	Region	Regional Pest Control Program Support
16	Region	Resource Center in Regional Planning Office
17	Region	Computer Center in Regional Planning Office
18	Region	Training of Shallow Wells Survey/Construction Unit
19	Region	Tanga Region Study Tour For Planners

20	Region	Study Tour to Botswana
21	Region	Regional Soil Conservation Workshop
22	Region	Regional Irrigation Seminar
23	Region	Regional Community Development Seminar
24	Region	Regional Cooperative Development Seminar
25	Region	Study Tour to Agricultural Research Stations
26	Region	Kiteto Land Use Planning Seminars
27	Region	Regional Organic Agriculture Seminar
28	Region	Reading University Livestock Course
29	Region	Cornell University Communications Seminar
30	Region	Procurement of Regional Radio System
31	Region	Fruit Tree Up-Grading, Horti-Tengeru

B. Arumeru District Projects

<u>Project Number</u>	<u>District</u>	<u>Project Name</u>
1	Arumeru	Ngarenanyuki Irrigation Rehabilitation
2	Arumeru	Maroroni Irrigation System
3	Arumeru	Pilot Agricultural Extension Program
4	Arumeru	Agriculture Field Staff Training
5	Arumeru	Irrigation Pump Procurement

6	Arumeru	Agriculture Field Staff House
7	Arumeru	Maize Production Seminars
8	Arumeru	Kisongo Dip Rehabilitation
9	Arumeru	Repairs to Livestock Dips
10	Arumeru	Livestock Field Staff Training
11	Arumeru	Spray Race Attendants House
12	Arumeru	Pilot Livestock Extension program
13	Arumeru	Grass Seed Multiplication plots
14	Arumeru	Olkokola Tree Nursery
15	Arumeru	Lekitatu Fishpond
16	Arumeru	Forestry Field Staff Training
17	Arumeru	Fisheries and Beekeeping Field Staff Training
18	Arumeru	Pilot Beekeeping Project - Nduruma
19	Arumeru	Village Tree Nurseries
20	Arumeru	Soil Conservation Seminars
21	Arumeru	Soil Conservation - Musa and Mwandet
22	Arumeru	Olkokola Land Use Planning Program
23	Arumeru	Ngarenanyuki Ox-Cart Production Unit
24	Arumeru	Uwiro Maize Mill
25	Arumeru	Ngabobo Maize Mill
26	Arumeru	Kisimiri Maize Mill

27	Arumeru	Samaria Maize Mill
28	Arumeru	Sakila Maize Mill
29	Arumeru	Kikwe Ward Building Brigades
30	Arumeru	Kiranyi Brick and Tile Production
31	Arumeru	Makumira Bakery
32	Arumeru	Lands Department Equipment Procurement
33	Arumeru	Kisongo Roads Base Camp
34	Arumeru	District Housing Construc- tion and Repair
35	Arumeru	Field Staff Bicycle Purchase Scheme
36	Arumeru	Sakila Pump Attendants House
37	Arumeru	Community Development Assistants Training
38	Arumeru	Village Godowns
39	Arumeru	Ox-cart Purchase Scheme
40	Arumeru	Olkokola Borehole Water Supply
41	Arumeru	Olkokola Gravity Water Supply Rehabilitation
42	Arumeru	Kikatiti Borehole Water Supply
43	Arumeru	Shallow Wells Survey and Construction
44	Arumeru	Village Water Supply Technician Training
45	Arumeru	Karangai Pipeline Rehabi- litation
46	Arumeru	Sakila Gravity Water Supply Rehabilitation

47	Arumeru	Sambasha Gravity Water Supply Project
48	Arumeru	Oldonyosapuk Hydraulic Ram water Supply

C. Hanang District Projects

<u>Project Number</u>	<u>District</u>	<u>Project Name</u>
1	Hanang	Pilot Agricultural Extension Project
2	Hanang	Qameyu Women Farmers Group
3	Hanang	Barley Production
4	Hanang	Training of Agricultural Extension Staff
5	Hanang	Oil Seed Production
6	Hanang	Magugu Irrigation Survey
7	Hanang	Magugu Irrigation Project
8	Hanang	Mapea Coconut Nursery
9	Hanang	Groundnut Purchase Scheme
10	Hanang	Ox-Plough Purchase Scheme
11	Hanang	Livestock Extension Program
12	Hanang	Qash Cattle Dip Attendant's Quarters
13	Hanang	Pasture Grass Seed Production
14	Hanang	Livestock Extension Staff Training
15	Hanang	Tsamasi Cattle Dip Improvement
16	Hanang	Nangwa-Dirma Livestock Watering Project
17	Hanang	Forestry Extension Program

18	Hanang	Hanang Forestry Project
19	Hanang	Village Tree and Fruit Nurseries
20	Hanang	Fruit Tree Nurseries
21	Hanang	Gallapo Fishpond
22	Hanang	Bassotu Fish Receiving Center
23	Hanang	Training Course for Forestry Extension Staff
24	Hanang	Fisheries Training Seminar
25	Hanang	Training in Project Planning for Women
26	Hanang	Bookkeeping Training for Village Women
27	Hanang	Training Seminar for Village Accountants
28	Hanang	Gedemar Oil Seed Press
29	Hanang	Madunga Kati Maize Mill
30	Hanang	Madunga Kati Wood-Working Project
31	Hanang	Mapea Mat-Marketing Project
32	Hanang	Qameyu Wood-Cutting Group
33	Hanang	Magugu Maize Mill and Rice Huller
34	Hanang	Village Maize Mill
35	Hanang	Ayamango Maize Mill
36	Hanang	Kizakiba Ox-Cart Factory
37	Hanang	Ox-Cart Purchase Scheme
38	Hanang	Hanang Extension Transportation Project

39	Hanang	Shallow Wells Survey and Construction
40	Hanang	Ring Wells Survey and Construction
41	Hanang	Katesh Gravity Water Supply Rehabilitation
42	Hanang	Gallapo Gravity Water Supply Rehabilitaiton
43	Hanang	Village Water Supply Technician Training

D. Mbulu District Projects

<u>Project Number</u>	<u>District</u>	<u>Project Name</u>
1	Mbulu	Labay Crop Storage Facility
2	Mbulu	Maghang Crop Storage Facility
3	Mbulu	Agriculture Training and Extension Support
4	Mbulu	Soil Conservation/Land Use Planning Karatu
5	Mbulu	Pilot Agricultural Extension Program
6	Mbulu	Dongobesh Oil Seed Production Project
7	Mbulu	Dongobesh Ox Plough Training
8	Mbulu	Murray Women's Vegetable Production Project
9	Mbulu	Mbulu Fruit Tree Orchard and Demonstration Facility
10	Mbulu	Dongobesh Pig Multiplication Unit Support
11	Mbulu	Training for Veterinary Center Attendants

12	Mbulu	Training Course for Dip Attendants
13	Mbulu	Moringa Village Slaughter Facility
14	Mbulu	Village Grass Seed Multiplication Plots
15	Mbulu	Cattle Dip Construction, Moringa Village
16	Mbulu	Training for Livestock Field Staff
17	Mbulu	Pilot Livestock Extension project
18	Mbulu	Karatu Slaughter Facility
19	Mbulu	Dongobesh Slaughter Facility
20	Mbulu	Livestock Disease Prevention Program
21	Mbulu	District Tree Planting
22	Mbulu	Dongobesh Fruit and Forest Tree Nursery
23	Mbulu	Murray-Kainam Fruit and Forest Tree Nursery
24	Mbulu	Daudi Ward Beekeepers Training Project
25	Mbulu	Daudi Ward Fruit and Forest Tree Nursery
26	Mbulu	Hayloto Village Fishpond
27	Mbulu	Forest Tree Seed Purchase and Distribution
28	Mbulu	Natural Resources Training and Extension Support
29	Mbulu	Soil Conservation Along District Roads
30	Mbulu	Bicycle Purchase Scheme for Extension Staff

31	Mbulu	Dongobesh Ox-Cart Production Unit
32	Mbulu	Tlawi Tile Production Project
33	Mbulu	Dongobesh Oil Seed Pressing Project
34	Mbulu	Kuta Village Maize Mill
35	Mbulu	UCDA Training Course
36	Mbulu	Training for CDA's and Village Leaders
37	Mbulu	Shallow Wells Survey and Construction
38	Mbulu	Ring Wells Construction
39	Mbulu	Yaeda Chini Gravity System Rehabilitation
40	Mbulu	Harsha Gravity Water System Rehabilitation
41	Mbulu	Upper Kitete Gravity System Rehabilitation
42	Mbulu	Kilima Tembo Gravity System Rehabilitation
43	Mbulu	Training of Village Water Technicians
44	Mbulu	Murray-Kuta Community Center
45	Mbulu	Maretadu Bridge Construction Project
46	Mbulu	Construction of Grade 'B' House, Mbulu Town

E. Roads Projects

<u>Project Number</u>	<u>District</u>	<u>Project Name</u>
1	Hanang	Dareda-Mbulu Border Road (27 Miles)

2	Hanang	Single-Gallapo-Mamire-Babati Road (29 miles)
3	Hanang	Babati-Nakwa-Riroda Road (10 Miles)
4	Hanang	Bashnet-Madunga Kati Road (11 Miles)
5	Hanang	Gitting-Endasak Road (8 Miles)
6	Hanang	Bashnet-Ufana Road (10 Miles)
7	Mbulu	Karatu-Mbulu-Dongobesh-Hanang Border Road (81 Miles)
8	Mbulu	Dongobesh-Haydom Road (30 Miles)
9	Mbulu	Oldeani-Mang'ola Road (30 Miles)
10	Mbulu	Njiapanda-Oldeani Road (6 Miles)
11	Mbulu	Mbulu-Kainam-Hayloto-Murray Road (15 Miles)
12	Arumeru	Tengeru-Mbguni Road (22 Miles)
13	Arumeru	Usa River-Ngarenanyuki-Oldonyosambu Road (10 Miles)