B Agriculture Sector
B. Agriculture Sector

B-1 Outline

Zambia has potential to expand agricultural production given the vast resource endowment in terms of land, labour and water that the country possesses. Of Zambia’s total land area of 75 million hectares (752,000 square Km), 58% (42 million hectares) is classified as medium to high potential for agricultural production, with rainfall ranging between 800 mm to 1,400 mm annually and suitable for the production of a broad range of crops, fish, and livestock. It is estimated that only 14% of total agricultural land is currently being utilized.

Zambia has the best surface and underground water resources in Africa, with many rivers, lakes, and dams. This, with the addition of high potential underground water aquifers in many areas, offers excellent prospects for irrigation programmes. However, these water bodies are largely unexploited. Of the country’s irrigation potential conservatively estimated at 423,000 hectares, only about 50,000 hectares are currently irrigated. Therefore, Zambia has a resource endowment for development of a wide range of crops, livestock, and fish given the diversity of its agro-ecological zones.

The country is divided into three major agro-ecological regions, namely Region I, II and III. Rainfall as well as the quality of soils differs across these regions.

Region I:
This region receives less than 800 m of rainfall annually and constitutes 12% of Zambia’s total land area. It consists of loamy to clayey soils on the valley floor and coarse to fine loamy shallow soils on the escarpment. It covers the Southern province and parts of Eastern and Western provinces. The Region is suitable for production of drought resistant crops like Cotton, Sesame, Sorghum and Millet and has potential for production of irrigated crops, like Winter Maize. This Region is also suitable for extensive cattle production and has limited potential for Cassava cultivation. The valley part of the region is on a low altitude and is consequently hot and humid: these areas are not suitable for cattle rearing because of Tsetse Flies.

Region II:
The Region receives between 800 to 1,000 mm of annual rainfall and constitutes 42% of the country. It is subdivided into two namely, Region IIa and IIb. Region IIa covers the Central Lusaka, Southern and Eastern fertile plateaux of the country and generally contain inherent fertile soils. Permanent settled systems of agriculture are practised. A variety of crops are grown in this Region and these include Maize, Cotton, Tobacco, Sunflower, Soya beans, irrigated Wheat, Groundnuts and other arable crops. The area is also highly suitable for flowers, Paprika and vegetable production. Region IIb covers Western province and consists of sandy soils. It is suitable for production of Cashew nut, Rice, Cassava and Millet, including...
vegetable and timber production. The Region is also highly suitable for Beef, Dairy and Poultry production.

Region III:
The region receives more than 1,000 mm up to 1,500 mm of rainfall annually and constitutes 46 % of the country’s total land area comprising the Copperbelt, Luapula, Northern and Northwestern provinces. With the exception of the Copperbelt, the Zone is characterized by highly leached, acidic soils. It has good potential for the production of Millet, Cassava, Sorghum, Beans and Groundnuts. Coffee, Sugarcane, Rice and Pineapples are also grown in this area. The agricultural potential of the Region can be enhanced by application of lime and its perennial streams can be utilized for small-scale irrigation. Increased exploitation of the fisheries resources and introduction of fish farming, offer good opportunities for development.

The agricultural sector is key to the development of the Zambia economy and will be the engine of growth for the next decade and beyond. Agriculture generates between 18-20 % of the Gross Domestic Product (GDP) and provides livelihood for more than that 50 % of the population. The sector absorbs about 67 % of the labour force and remains the main source of income and employment for rural women who constitute 65 % of the total rural population. Increase in rural incomes will therefore result in overall poverty reduction and increased food security.

Existing reports, such as the Living Conditions Monitoring Survey of 1998 by the Central Statistical Office (CSO), indicate that Zambia is faced with high levels of poverty, with overall
poverty of 72.9 % of the national population in 1998. Income levels have also drastically declined with low formal employment. Given the abundant natural resource base, agriculture offers the greatest potential for generating growth and increasing employment and incomes. Smallholder farming represents a large potential resource for increased agricultural production and poverty reduction. However, realizing this potential will require an enabling and conductive policy environment.

Concerted efforts have been made since 1992 to liberalize the agricultural sector. Notable policy measures undertaken include the liberalization of agricultural marketing for all inputs and products including exports, the privatization of all former agro parastatals and increased private sector participation in commodity marketing and input supply and restructuring of the Ministry of Agriculture and Cooperatives (MACO). There is however an unfinished policy agenda for the sector given existing major constraints and challenges. These include; poor service delivery particularly for small-scale farmers, marketing constraints especially in outlying areas as a result of poor infrastructure notably feeder roads, a void in agricultural finance and credit, weak regulatory framework and poor enforcement of legal framework, unfavourable world and regional markets, and poor accessibility and administration of land in Zambia. There constraints need to be seriously and urgently addressed if agriculture is to develop.

B-2 Constraints

Agricultural growth has been below its potential due to a number of constraints. The following are some of the constraints that need to be addressed in order to increase production and economic growth in the sector:

- Low productivity - due to lack of access to resources and agricultural service support and loss of draught power;
- High dependence on rain fed agriculture and related risks, and limited utilization of irrigation;
- High post-harvest losses;
- Deficiencies in the early warning system and inadequate strategic food reserves;
- Limited diversification of agricultural production;
- High incidence of crop and livestock pests and diseases;
- Inadequate infrastructure and high energy/transport costs leading to poor market access by farmers resulting in loss of income and poor access to inputs;
- Limited access to affordable credit especially for medium and long-term investments;
- Poor functioning agricultural grain markets, which limit small farmers to access markets;
- Restrictive trade policies which affects price volatility and regional specialization;
- Limited domestic market;
- Security of land tenure and land acquisition issues;
Chapter 4  Sectoral Development Strategies

- Poor coordination of agricultural and food security programmes - there has been poor coordination of the various interventions being implemented by government, NGOs and cooperating partners;
- Limited mainstreaming of gender in agriculture - despite women being major food producers, their access to productive resources and services is limited leading to low productivity;
- Environmental degradation due to unsustainable agricultural practices;
- The loss of labour due to the impact of HIV/AIDS, which has been undermining households’ income generating and food security activities;
- Low purchasing power of the majority of the population;
- Lack of an enabling environment.

B-3  Policy


President Levy Patrick Mwanawasa, SC has year 2004 approved the National Agricultural Policy (NAP). The approved Policy is aimed at providing a conducive environment for the growth of the agricultural sector up to 2015. Past agricultural policies were restrictive and constraining with strong government intervention and participation. In addition, the strategies pursued were not sustainable because of their heavy reliance on subsidies. Consequently, these policies and strategies failed to stimulate growth in the sector. Up to early 1990s, the sector was poorly developed and dominated by a single crop-maize. The sector also lacked private sector participation in the areas of agricultural marketing, input supply and processing.

In 1992, the government embanked on agricultural sector policy reforms, which were part of the overall economic reforms pursued under the Structural Adjustment Programme. The main policy thrust of the reforms was liberalization of the agricultural sector and promotion of private sector participation in production, marketing, input supply, processing and credit provision.

Government recognizes the dual nature of the agricultural sector in which the vast majority of small-scale farmers is resource poor, have low production and productivity and are usually food insecure.

The main thrust of the National Agricultural Policy are increased production, sector liberalization, commercialisation, promotion of public and private sector partnerships and provision of effective services that will ensure sustainable agricultural growth. In doing so, the Government will not ordinarily intervene in inputs distribution or crop marketing in a way that will undermine or undercut private sector participation especially if the private sector has the will or capacity to do so.

The vision for the agricultural sector is “to promote development of an efficient, competitive
and sustainable agricultural sector, which assures food security and increased income”. It recognises the need to strengthen and expand the emerging opportunities and to also deal with the challenges facing the agricultural sector. This vision also strives to contribute to the overall goal of the Poverty Reduction Strategy Paper (PRSP), which is to achieve “poverty reduction and economic growth”.

In line with this vision, the specific objectives of the agricultural sector are:

- To assure national and household food security
- To ensure that the existing agricultural resource base is maintained and improved upon
- To generate income and employment to maximum feasible levels
- To contribute to sustainable industrial development and
- To expand significantly the sector’s contribution to the national balance of payments.

To achieve the above objectives, the strategies include:

- Strengthening and monitoring the liberalization of markets and facilitating private sector development.
- Strengthening the capacity of agencies handling agricultural products for export in ensuring that the products meet the standards and sanitary and phytosanitary requirements for export markets.
- Promoting and securing access of agricultural products to both local and international markets.
- Diversification of agricultural production and utilization.
- Strengthening and facilitating the provision of agricultural services.
- Reviewing and realigning institutional and legislative arrangements.
- Facilitating availability of and accessibility to land for agriculture and development of infrastructure in potentially productive agricultural areas.
- Development and promotion of appropriate technology.
- Promotion of gender equity in resource allocation and access to agricultural services focusing more on women and young farmers.
- Promotion of sustainable and environmentally sound agricultural practices.
- Prevention and control of pests, crop and livestock diseases of national economic importance.
- Promoting conservation of fisheries resources.
- Strengthening emergency preparedness through early warning and timely and efficient crop forecasting.
- Promotion irrigation development.
- Promotion and strengthening Cooperatives and Farmer Organizations as a vehicle for agricultural development.
- Facilitating provision of incentives for local and foreign agricultural investment.
• Strengthening information collection and dissemination.
• Re-enforcing the sector’s regulatory functions; this will also include liaising or coordinating with the appropriate institutions or bodies responsible for the regulation of the use of biotechnology and the resulting products, particularly Genetically Modified Organisms (GMOs).
• Maintaining agro-biodiversity and promoting conservation of aquatic eco-system and sustainable utilization of natural resources.

Under the agricultural vision and proposed policies, both food and cash crops will be targeted to increased production and productivity in order to attain and sustain food security and income generation, taking into account agro-ecological conditions. It is expected that an increased number of small scale farmers will be fully integrated in commercial production through outgrower arrangements or as individuals.

Overall, crop production increases will come from expansion of area under cultivation; expansion of irrigable land; increased productivity through improved variety releases and better research/extension linkages; increased use of better and sustainable farming practices including conservation farming, crop rotation, and low input agriculture; increased use of animal draught power. Appropriate post-harvest technologies will be put in place to improve post-harvest management and utilization.

Given Zambia’s resource endowment, diversification of agriculture will be promoted taking into account the comparative advantage in crops, livestock and fisheries (including aquaculture) production.

The main thrust in the livestock sector will be to control livestock diseases, re-stocking, management and improved quality of marketable livestock and livestock products especially in the “traditional” sector. Breeding will also be enhanced.

For fisheries, the focus will be to promote community based resource management of capture fisheries thereby improving catches. Concerted efforts will also be made to promote aquaculture development. Better marketing and processing facilities will be promoted and the distribution network improved.

Notwithstanding the emphasis on the development of small-scale farmers, support and provision of a conducive environment will be provided for the growth of the large scale-farming sector in order to maximize the synergies between the two. Small-scale farmers will, through relevant legislation, be encouraged to form and register co-operatives and other farmers’ organizations. Emphasis will be on primary and district level farmer organizations.

Government will focus on providing public goods that are needed for efficient sector growth such as rural infrastructure, basic research, epidemics and pest control. Agribusiness will be encountered to strengthen linkages with smallholder service delivery with emphasis on decentralization of service provision.

Increasingly, the role of the public sector will be confined to policy formulation, enforcement of
legislation, regulation and inspection, maintenance of the strategic reserves, provision of market information, financing the control of pests and diseases of national economic importance, provision of agricultural services i.e. research and extension in partnership with the private sector, provision of targeted support to outlying areas and underprivileged farmer groups, capacity building within public and private organizations, and monitoring and evaluation of overall sector performance including projects, programmes, and sector coordination.

The Ministry responsible for agriculture will also endeavour to increasingly commercialize some services it is currently providing including cost sharing. These services include research, extension, soil and seed testing and agricultural training. Emphasis will be on developing partnerships between government and farmers, the private sector, NGOs and cooperation partners.

All these measures are expected to result in the following: attainment of food security for the majority of households; agriculture’s contribution to total foreign exchange earnings will increase from the current 3-5% to 10-20% by 2015; agriculture will grow at between 7-10% pre annum from 2005 onwards; overall agricultural contribution to GDP will rise from the current 18-20% to over 30% by 2015; and agriculture will be the leading sector in terms of employment and income generation. Overall, these attainments will place agriculture as the leading sector in terms of food security, economic growth and poverty reduction.

In the implementation of the Policy a number of risks and assumptions have been noted.

It is recognized that factors outside the Ministry of Agriculture and Co-operatives or the Agricultural Sector in general, such as the state of the road network, land tenure and administration, energy, communication, HIV/AIDS and world markets, have a profound impact on the development of the Sector. There is, therefore, need to remove or minimize constraints in these key areas for the sector to develop and to encourage cross-sectoral dialogue and actions. HIV/AIDS is rapidly becoming the number one constraint to economic development in general and the agricultural sector in particular. The disease has a negative impact on agricultural production. The problem requires attention by the Ministry in various ways including modification of extension and research priorities, incorporation of HIV/AIDS related information in extension messages and encouraging introduction of HIV/AIDS in the curricula of agricultural training institutions.

In addition, the successful implementation of the Policy assumes that:

- The Ministry, in particular and the Agricultural Sector, in general would be adequately funded and equipped.
- Ministry staff would be provided with attractive remuneration and incentive packages.
- There would be policy consistency and/or continuity.
- Weather conditions would be favourable before irrigation is fully developed, especially among the small-scale farming community.
B-3-2 Fifth National Development Plan (2006-2010, Agriculture)

The Fifth National Development Plan (2006-2010) will strive to contribute to the achievement of the goal of the agricultural sector through the implementation of a number of proposed programmes. Role of the public sector will be to encourage growth in the agricultural sector by fulfilling those functions which are truly public goods. It will formulate and implement policies to create an enabling environment, which encourages the participation of the private sector, NGOs and cooperating partners. The plan has the following specific priority objectives:

1. To formulate and implement appropriate strategies through multi-sectoral and coordinated interventions with a focus on increased food security and economic growth
2. To promote the development of a competitive, efficient and transparent public and private sector driven marketing system for agricultural commodities and inputs
3. To promote the improvement of agricultural land for sustainable production and productivity
4. To promote a well-regulated and profitable irrigation sub sector that is attractive to both the public and private sector
5. To improve the productive efficiency of the livestock sector in a sustainable manner and support the marketing of both livestock and livestock products and contribute to food security and income
6. To provide efficient and effective technology development and transfer services to assist farmers increase agricultural production and productivity and diversify crop production and utilization
7. To increase fish production and promote sustainable utilization of fisheries resources thereby contributing to the economy through the generation of employment, income and improved availability of fish
8. To create an enabling environment for the development of autonomous, transparent, viable and demand-driven co-operatives and other farmer organizations that will contribute to economic growth and poverty reduction
9. To provide skilled human resource for the agricultural sector through capacity building in order to increase the sector’s production and productivity.

The followings present the proposed programmes.

1. Policy formulation and coordination programme
2. Agricultural Marketing, Trade and Agribusiness Development Programme
3. Agricultural Infrastructure and land development Programme
4. Irrigation Development and Support Programme
5. Animal Health Programme
6. Livestock Research and Development Programme
7. Livestock Production, Training & Extension Programme  
8. Livestock Marketing and Trade Programme  
9. Agricultural Research and Technology Development  
10. Agricultural Extension  
11. Agricultural Seed Support Programme  
12. Farm Power and Mechanization Programme  
13. Aquaculture Development Programme  
14. Capture Fisheries Management and Development Programme  
15. Fish Processing and Marketing Programme  
16. Fisheries Training Programme  
17. Fisheries Coordination and Management Programme  
18. Cooperative Development Programme  
19. Human Management and resource development programme

The programmes and activities will be monitored based on the indicators developed. Other main monitoring indicators and instruments can be developed or refined as the programme is implemented. The more comprehensive impact evaluations will require household surveys to be conducted by institutions like CSO in collaboration with MACO. This shall be complemented by independent assessments from stakeholders on sector performance and programme implementation. A system for gathering both quantitative and qualitative information at national, provincial and district level in order to regularly monitor implementation and measure the impact of the programme activities will be essential. Agricultural growth will principally be driven by commercial agriculture from both large and smallholder strongly linked to commodity value chains such as cotton, coffee, tobacco and horticultural crops.

All these measures are expected to result in the following:

- Attainment of food security for the majority of households with at least 90 percent of population being food secure by 2010.
- Agriculture’s contribution to total foreign exchange earnings will increase from the current 3-5% to 10-20% by 2010.
- Agriculture will grow at 10% per annum from 2006 onwards.
- Overall agricultural contribution to GDP will rise from 18-20% to 25% by 2010. The share of crops, livestock and fisheries will thus increase.
- Increased incomes for those involved in the agricultural sector.

Overall, these attainments will make agriculture the leading sector in terms of food security, economic growth and poverty alleviation.
CONCLUSION

The effective implementation of the Agriculture Sector Programmes under the National Development Plan (2006-2010) will transform overall agriculture into a dynamic sector over time, which is expected to bring about significant positive changes in the national economy. In respect of time, the strategies in the Plan will be evaluated and reviewed in the context of overall economic condition of the country and changing agricultural production system, and accordingly measures will be taken to update the strategies.

The importance of promoting agricultural trade both in the region and beyond cannot be overemphasized. This is particularly so given developments in the Common Market for Eastern and Southern Africa (COMESA), Southern Africa Development Community (SADC), the African Caribbean and Pacific/European Union (ACP/UE) Cotonou Agreement and the World Trade Organization (WTO). Zambia will have to ensure that it takes full advantage of these developments and put in place measures that promote fair and beneficial agricultural trade.

To encourage more investment in the sector, the Plan particularly will place emphasis on facilitating efficient land administration by working closely with the Ministry of Lands. Other key players are the Ministries of Commerce, Trade and Industry, Energy and Water Development, Transport and Communications, Works and Supply, Tourism, Environment and Natural Resources and Finance and National Planning.

B-3-3 National Irrigation Plan (May 2005)

Taking into account the vulnerability of Zambia’s agricultural sector to weather and climatic vagaries, MACO has recently designed a National Irrigation Strategy that would provide guidance to all levels and types of investments in irrigated agriculture. It is now logical for MACO to develop a National Irrigation Plan (NIP) as part of the National Development Plan (NDP) that would run from 2006 to 2011 to specify a costed plan.

Zambia has a pervasive dependence on rains. It has therefore, from time to time suffered severe droughts, resulting in reduced crop yields and livestock losses. Both agricultural production and productivity have shown high vulnerability to adverse weather patterns with cyclical trends in national harvest a pattern of alternating surpluses and food deficits. The overall macro-economic growth and welfare indicators are sensitive to the availability or absence of food surpluses and deficits. There is an urgent need to break this pattern especially that Zambia possesses tremendous land and water resources.

Zambia has over 1,740,380 million cubic metres of underground water resources and possesses over 423,000 ha of irrigable land of which about 100,000ha is actually irrigated among large scale, emergent and smallholder farmers.

Government has in recent past decided to transform the potential of irrigation into a reality to achieve food security, enhance income and employment generation opportunities. Through this
NIP, MACO is proposing a package of interventions that once implemented, will break the cycle of vulnerability that Zambia is exposed to. The NIP proposes a strategy for full, efficient and sustainable exploitation of both surface and underground water resources by promoting irrigation in its various forms and targeted at the different farmer types to ensure all round agricultural production of food, cash, export and industrial crops.

Establishment of an Irrigation Development Fund (IDF): The IDF would be a source of capital for investment in irrigation-related projects and acquisition of technology by farmers and industry operators.

The Ministry of Agriculture and Cooperatives (MACO), through the Technical Services Branch (TSB) shall remain the main technical, regulatory and monitoring custodian of the NIP interventions. However, different components shall be contracted or placed under special institutional arrangements to facilitate access by all stakeholders.

In the medium to long term, the IDF would also cater for the financing of communal water supply systems of a public nature, for irrigation drawing from existing water bodies like lakes, rivers, dams, canals, etc. Groups of farmers in high irrigation potential areas and with proven linkages to markets can approach the Rural Investment Fund (RIF) that would manage this component of the IDF.

The Government has shown a lot of political will and leadership since the drought of 2001 by exploring various ways to promote off season cultivation. The IDF is not a far-fetched idea and could pay for itself once stimulated with such a fund commitment on higher scale.

Given the potential benefits to the national economy, the NIP should be a home grown and Government-owned Initiative financially supported through the National Treasury as special programme or Fund under NDP. The total direct resource commitment is estimated at US$150million for the five-year period. Table below gives a breakdown of the resource allocation:

<table>
<thead>
<tr>
<th>Table B-1 NDP Resource Commitment By Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
</tr>
<tr>
<td>Irrigation Development Fund (IDF)</td>
</tr>
<tr>
<td>Infrastructure Development (public)</td>
</tr>
<tr>
<td>Institutional and Social</td>
</tr>
<tr>
<td>Capacity building of MACO Extension</td>
</tr>
<tr>
<td>Capacity Building - Farmer Organisations</td>
</tr>
<tr>
<td>Capacity Building - Out Grower Promoters</td>
</tr>
<tr>
<td>Strengthen Irrigation research capacity</td>
</tr>
<tr>
<td>Capacity building -Technology Development and Advisory Unit – UNZA</td>
</tr>
<tr>
<td>Grand Total</td>
</tr>
</tbody>
</table>
Irrigated area could be increased by about 70,000ha of which 10,000ha among large scale commercial, 30,000ha among emergent farmers and 30,000 ha among small scale farmers. Incremental production based on this irrigation hectarage would result in guaranteed food for strategic reserves, reduction in food imports, export of surplus food, export of high value cash and increased industrial outputs and employment.

A simple calculation shows that if all this hectarage was committed to maize which is not a high value crop, at highly conservative price of US$150/ton and average yield of 4ton/ha, the programme would raise a gross income of US$42 million against a proposed investment of only US$30million.

**B-3-4 Organization Structure of Ministry of Agriculture and Cooperatives**

Organization Structure of Ministry of Agriculture and Cooperatives is shown on the following page.
Figure B-2 ORGANIZATION STRUCTURE OF THE MINISTRY OF AGRICULTURE AND COOPERATIVES

MINISTER
(Mr. Mundia Sikatana)

Deputy Minister
(Mr. James Katoka)

Deputy Minister
(Mr. Alexis Luhila)

Permanennt Secretary
Agriculture Division
(Mr. Richard Chizyuka)

Permanent Secretary
Cooperatives & Marketing
Development Division
(Dr. Sam Mumbi)

Veterinary & Livestock Development

Department of Agriculture

Director: Mr. I.M. Akyonbokwe
Deputy: Dr. P.G. Sinyangwe
Deputy (Tsetse Control) Dr. M.P. Mangani
Deputy (Livestock Dev.) Mr. D. Daka

Agriculture Research Institute

Director: Dr. W. Mwale
Deputy: Dr. T. Zulu (fisheries)

Department of Fisheries

Director: Mr. A. Chisibembe
Deputy: Mr. M. Mwale

Seed Control & Certification Institute

Director: Ms. M. Chipili
Deputy: T. Zulu (research)

FRA
Chairman: Mr. C. Chilala
Director (vacant)
Deputy: Mr. G. Mbozi

Department of Agriculture

Department of Agribusiness & Marketing

Department of Cooperatives Development

Director: Ms. A.M. Sihwala
Deputy: Mr. G. Mbozi

COMMON USER DEPARTMENTS

Provincial & District Coordinating Offices

1. Eastern – Mr. O. Kabanda
2. Central – Mr. P. Chiulo
3. Copperbelt – Ms. Ndulu
4. Luapula – Mr. W.S. Kalumba
5. Lusaka – Mr. Mungalaba
6. Northern – Mr. L. Lyembeni
7. Northwestern – Mr. Jeko
8. Western – Mr. Simbanga
9. Southern – Dr. Songolo

Department of Policy and Planning

Director: Mr. J.J. Shawa
Deputy (Program planning) - Mr. E.C. Kalaba
Deputy (Policy) - Mr. C. Nkaliko

Department of HRA (To include FMU, Procurement & Maintenance & Coordination of Colleges)

Director HRA: Mr. B. Nalishiwulwa
Assistant: Mr. Muyawanyoko

National Agriculture Information Services

Acting Head: Mr. E. Katowezi
B-4 Proposed Project

**B-4-1 Proposed Project by Ministry of Agriculture and Cooperatives**

Proposed Projects by Ministry of Agriculture and Cooperatives are shown in Table B-2.
### Table B-2 Proposed Project by Ministry of Agriculture and Cooperatives

<table>
<thead>
<tr>
<th>Priority</th>
<th>Implementing Agency</th>
<th>Sector</th>
<th>Scheme</th>
<th>Project Name</th>
<th>Project cost (US$)</th>
<th>Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MACO, Technical Services Branch, Irrigation Engineering Section</td>
<td>Agriculture</td>
<td>GGA</td>
<td>Pilot Agricultural Commercialization Project (Nega nega Smallholder irrigation Scheme)</td>
<td>4,838,750</td>
<td>70km from Lusaka on north-western side of Manali hills in Mazabuka district</td>
</tr>
<tr>
<td>2</td>
<td>MACO, Technical Services Branch, Irrigation Engineering Section</td>
<td>Agriculture</td>
<td>GGA</td>
<td>Strengthen Irrigation Research capacity at Nanga</td>
<td>1,836,001</td>
<td>Approx. 24km from Mazabuka district Ruma</td>
</tr>
<tr>
<td>3</td>
<td>MACO - Policy and Planning</td>
<td>Agriculture</td>
<td>RR2</td>
<td>Fertiliser Support Project for Small-scale Farmers by the Increase of Food Production</td>
<td>3,000,000</td>
<td>Northern, Lusaka and Central Province</td>
</tr>
<tr>
<td>4</td>
<td>MACO: Department of Veterinary and Livestock Development</td>
<td>Agriculture</td>
<td>Other</td>
<td>Controlling Foot and Mouth Disease through consistent vaccinations</td>
<td>5,978,083</td>
<td>Southern, Central, Lusaka and Northern Provinces</td>
</tr>
<tr>
<td>5</td>
<td>MACO: Department of Veterinary and Livestock Development</td>
<td>Agriculture</td>
<td>DS</td>
<td>Identification of Truffle flies from the Western Belt of Zambia</td>
<td>19,121,148</td>
<td>Western and Southern Provinces</td>
</tr>
<tr>
<td>6</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Field Recording Equipment</td>
<td>Portable Recorders 72 sets</td>
<td>72 District centres</td>
</tr>
<tr>
<td>7</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Self powered (Wind-Up Solar radio sets)</td>
<td>Wind-Up solar radio 1000 sets</td>
<td>5 Provinces, Eastern, Lusaka, Southern, Western Expansion of the project</td>
</tr>
<tr>
<td>8</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Literature production (Farmers Diary)</td>
<td>Farmers' Diaries 6000 copies</td>
<td>Country wide</td>
</tr>
<tr>
<td>9</td>
<td>MACO-Agriculture (Extension Branch)</td>
<td>Agriculture</td>
<td>TA</td>
<td>Capacity Building of small scale women and young farmers in crop and food processing technologies</td>
<td>2,000,000</td>
<td>Southern, Western, Eastern and North Western Provinces</td>
</tr>
<tr>
<td>10</td>
<td>MACO, Technical Services Branch</td>
<td>Agriculture</td>
<td>TA</td>
<td>Peri-urban Irrigation Development Project</td>
<td></td>
<td>Lusaka district</td>
</tr>
<tr>
<td>11</td>
<td>MACO</td>
<td>Agriculture</td>
<td>Other</td>
<td>Rehabilitation of food grain storehouse</td>
<td></td>
<td>Chambishi, Masasa, Miriti, Chingola, Mumbwa, Kalomo</td>
</tr>
<tr>
<td>12</td>
<td>MACO, Technical Services Branch</td>
<td>Agriculture</td>
<td>DS</td>
<td>Small scale Irrigation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sector:** Agriculture  
**Health:** TA  
**Human Resource:** Expert  
**Economic Development:** DS, KR, KR2, NPGA, Training, Volunteer  
**Other:**
B-4-2 High Priority Projects

(a) Pilot Agricultural Commercialization Project

i) Introduction
The farmers of the Nega-Nega basin have for years had a keen eye on the water resources of the Kafue River which flows some 12 km from its reach. A number of projects have been identified for development without any coming to fruition so far. This project takes the idea of bringing water from the Kafue to the Nega-Nega basin closer to reality by examining the engineering issues and the cost implications of such a project.

ii) Project Area
The main project area, gross of 26,820 ha, encompasses the whole catchment of the Nega-Nega River, which is bounded by the Muvuma Hills (Munali) on the east, the railway on the north, and the watershed hills on the west. The project area crosses the main Lusaka Mazabuka road in the south of about 5.0 km. The tribal land on the east of the Muvuma Hills is also included as much arable land is available for irrigation.

The elevation of the project starts at 977 m at the Kafue River and rises to 1,170 m in the south-west. Most of the irrigable land is below 1,090 m, a lift of 113 m.

The Project comprises a mixture of traditional farmers, medium scale farmers, small scale farmers and large scale farmers with the following percentages:

<table>
<thead>
<tr>
<th>Farm Type</th>
<th>Area (ha)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>5,681</td>
<td>21 %</td>
</tr>
<tr>
<td>Small Scale</td>
<td>7,767</td>
<td>29 %</td>
</tr>
<tr>
<td>Medium Scale</td>
<td>2,679</td>
<td>10 %</td>
</tr>
<tr>
<td>Large Scale</td>
<td>10,691</td>
<td>40 %</td>
</tr>
<tr>
<td>Total</td>
<td>26,819</td>
<td>100 %</td>
</tr>
</tbody>
</table>

iii) Rainfall and Crops

1. Rainfall and Irrigation
The mean annual rainfall is 744 mm which is similar to that obtained at Nanga Farm to the north west of the project area. The area just to the west of the Muvuma Hills is considered to fall in the rain shadow so may get slightly less rainfall that the mean of 744 mm.

2. Crop Water Requirements
The following crops have been considered suitable for production using irrigation in the project area: sugar cane, cotton, sugar beans, wheat and coffee. Cotton and beans are both summer crops but both would benefit from supplementary irrigation before and after the main rain
months. The crops considered are those where there is an available market for the produce. Crops such as vegetables are not considered suitable for large scale production as the market is very uncertain. The maximum demand duty is 0.95 l/s/ha in November for sugar cane followed by 0.93 l/s/ha in October for mature coffee. It is anticipated most of the area will be planted to wheat which has a maximum demand of 0.79 l/s/ha in August. The project design duty has been taken as 0.83 l/s/ha as a weighted average.

iv) Facility Plan and Cost

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lift Canal and Pump Station</td>
<td></td>
<td>409,672</td>
<td>3.00</td>
<td>1,229,017</td>
</tr>
<tr>
<td></td>
<td>Earthworks for canal</td>
<td>m³</td>
<td>409,672</td>
<td>3.00</td>
<td>2,640,000</td>
</tr>
<tr>
<td></td>
<td>Pump Station</td>
<td>No.</td>
<td>10</td>
<td>264,000</td>
<td>196,000</td>
</tr>
<tr>
<td>2</td>
<td>Canals, Concrete Parabolic</td>
<td></td>
<td>29,825</td>
<td>51.56</td>
<td>1,537,777</td>
</tr>
<tr>
<td></td>
<td>Canal Structures</td>
<td>m</td>
<td>29,825</td>
<td>51.56</td>
<td>7,000</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>28</td>
<td>7,000</td>
<td>196,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pipelines</td>
<td></td>
<td>8,172</td>
<td>300</td>
<td>2,451,600</td>
</tr>
<tr>
<td></td>
<td>Steel/FRP, 1,200 mm φ</td>
<td>m</td>
<td>8,172</td>
<td>300</td>
<td>2,451,600</td>
</tr>
<tr>
<td>4</td>
<td>Primary Pumping Stations</td>
<td></td>
<td>1,030,000</td>
<td>1,030,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P1, 4 Pumps, 0.69 m³/s @ 25 m TDH</td>
<td>No.</td>
<td>1</td>
<td>1,030,000</td>
<td>1,030,000</td>
</tr>
<tr>
<td></td>
<td>P2, 5 Pumps, 0.41 m³/s @ 40 m TDH</td>
<td>No.</td>
<td>1</td>
<td>1,030,000</td>
<td>1,030,000</td>
</tr>
<tr>
<td>5</td>
<td>Holding Ponds</td>
<td></td>
<td>66,000</td>
<td></td>
<td>594,000</td>
</tr>
<tr>
<td>6</td>
<td>Irrigation, On-Farm Systems</td>
<td></td>
<td>1,770</td>
<td>2,100</td>
<td>3,717,000</td>
</tr>
<tr>
<td></td>
<td>Centre Pivot</td>
<td>ha</td>
<td>1,770</td>
<td>2,100</td>
<td>4,191,000</td>
</tr>
<tr>
<td></td>
<td>Hand Moved</td>
<td>ha</td>
<td>2,540</td>
<td>1,650</td>
<td>3,177,000</td>
</tr>
<tr>
<td></td>
<td>Drip</td>
<td>ha</td>
<td>280</td>
<td>2,800</td>
<td>784,000</td>
</tr>
<tr>
<td>7</td>
<td>Operation Infrastructure</td>
<td></td>
<td>20,636</td>
<td>60</td>
<td>1,238,160</td>
</tr>
<tr>
<td></td>
<td>Roads</td>
<td>m</td>
<td>20,636</td>
<td>60</td>
<td>1,238,160</td>
</tr>
<tr>
<td></td>
<td>Staff Housing</td>
<td>No.</td>
<td>1</td>
<td>114,750</td>
<td>114,750</td>
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<tr>
<td></td>
<td>Office</td>
<td>No.</td>
<td>1</td>
<td>250,000</td>
<td>250,000</td>
</tr>
<tr>
<td></td>
<td>Workshop</td>
<td>No.</td>
<td>1</td>
<td>350,000</td>
<td>350,000</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td>No.</td>
<td>1</td>
<td>224,800</td>
<td>224,800</td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td>No.</td>
<td>1</td>
<td>287,425</td>
<td>287,425</td>
</tr>
<tr>
<td>8</td>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surveying, Design, setup</td>
<td>%</td>
<td>sum</td>
<td>2.5%</td>
<td>546,638</td>
</tr>
<tr>
<td></td>
<td>Contingencies</td>
<td>%</td>
<td>sum</td>
<td>5.0%</td>
<td>1,031,826</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>23,443,993</td>
</tr>
</tbody>
</table>

v) Operational cost and Water Charge

The water charge is very dependant on the cost pumping. The total volume and subsequently the total kW-hours has been estimated for each pumping station. A total of 68.68 million m³ will be pumped per year by each of the 10 lift stations, while P1 will pump 64.1 million m³ and P2 will pump 36.8 million m³. The total power consumed by all pump stations is 35.3 million kW-hours.

The following is the calculation for the water charge.

Total Annual Power consumed: 35.3 m kW-h
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Total Annual Volume 64.12 m³
Power consumed per m³ 0.55 kW-h/m³
Cost per kW-h US $ 3.23/kW-h
Cost per m³ US $ 1.78/m³
Overhead and loan factor 1.7
Water Charge US $ 3.02/m³

The cost per kW-h is based on recent ZESCO bills for Tariff MD1 and some MD2 meters used on Mubuyu Farm and converted at a rate of ZK 4,850=US$1.00. The factor of 1.7 used to increase the power cost is based on the ZSC factor used to charge Kaleya Smallholders, whose water charge is US $ 1.6/m³. This factor may seem a little high and needs further review.

(b) Refurbishment of the National Irrigation Research Station, Nanga

i) Current situation

Despite its huge potential, Zambia's agriculture sector is not making a significant contribution to poverty reduction and overall growth of the economy. In 2000, Zambian GDP grew by 3.5 percent per year while the agriculture sector growth rate was only 1.8%. Agriculture sector growth rate is far lower than the population growth rate of 2.9 percent per year. Agricultural performance on smallholdings has been particularly constrained due to lack of access to resources, geographical isolation causing lack of access to services and markets, lack of productive assets such as oxen and mechanized farm implements, and the lack of labour due to decimation of productive labour by the HIV/AIDS pandemic. From 1999, some 25 vegetable farms producing for both the domestic and export markets have failed with a total vegetable loss of 1,440 ha and a flower loss of 82 ha. Many of these large farms depended on smallholder out-growers to beef-up their vegetable export volumes. Most of these out-growers are smallholder irrigation farmers who depend on the support of the NIRS for planting materials and irrigation technology. A fully operational NIRS would contribute to the sustainability of smallholder production and recovery of some or all of the lost hectarage.

ii) Objectives of the project

**Overall Objective:** The overall objective of this proposed project is to refurbish the National Irrigation Research Station at Nanga thereby improving the capacity of the centre to carry out research activities more effectively.

**Specific Objectives:** The following are the specific objectives of this project:-
1. To procure and install new irrigation water pumping plant and to service and repair any existing serviceable water pumping plant.
2. To repair, renovate and construct new buildings as necessary for library, laboratories, stores, workshops, offices and living quarters.
3. To procure necessary farm machinery and equipment including tractors, ploughs, harrows and hand implements.
4. To repair water storage, conveyance and distribution structures for domestic and irrigation purposes.
5. To procure and install field irrigation equipment including sprinklers and drip systems.
6. To open up land for research and commercial seed and food crop irrigated production.
7. To sponsor research personnel and station support staff to attend appropriate courses locally, regionally and internationally.

These project objectives are in direct support of the objectives of the station which are:
1. To provide breeder’s seed in large quantities including vegetables, maize, sorghum, sunflower, wheat and food legumes.
2. To supply certified seed of all the crops and any others in accordance with demands from farmers.
3. To provide good quality improved planting materials for various crops including sweet potatoes, cassava, fruits, mulberry for silk worms, coffee, soil fertility improving species.
4. To develop and adapt improved small holder irrigation technologies.

iii) Outline of the project

**Physical Infrastructure**
The following infrastructure would need to be fully refurbished:
- 129 Nr housing units of various sizes
- 1 Nr workshop
- 3 Nr stores
- 2 Nr office blocks
- 1 Nr soil physics laboratory
- 1 Nr plant pathology laboratory
- 1 Nr seed processing shed
- 1 Nr library
- 1 Nr tissue culture laboratory
- 1 Nr cold storage room
- 1 Nr guest-house with catering facilities
- 50 km murram roads
- 10 km canals
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- 3 Nr water reservoirs
- 100 km water piping
- Nr pump houses
- 10 km electrical fencing
- 2 Nr standby electricity generators
- 2 Nr transformers
- Various agro-meteorology station repairs

**Vehicles, irrigation installations, field, workshop and office equipment**

- 2 Nr 4x4 pickup double cabin vehicles
- 1 Nr light truck
- 1 Nr 7 tonne truck
- 1 Nr 60 hp tractor
- 1 Nr 120 hp tractor
- 6 Nr motor cycles
- 2 Nr 120 l/s pump-sets
- 8 Nr 50 l/s pump-sets
- 1 Nr x 50 ha centre pivot irrigation system
- 100 ha modular sprinkler system
- 5 Nr boreholes with casing and pump
- 1 Nr mould board plough
- 1 Nr x 4 disk plough
- 1 Nr ditcher
- 1 set of instruments for field moisture determination
- 1 complete set of workshop machinery, tools and equipment
- 1 Nr compressor
- 5 Nr laptop computers
- 5 Nr desktop computers
- 1 Nr laser printer – black
- 1 Nr laser printer – colour
- 1 Nr photocopy machine
- 1 Nr scanner
- 2 Nr digital cameras
- 1 Nr v-satellite system
- Complete assortment of laboratory analytical equipment and tools
- All supporting software and installation
iv) Benefits /beneficiaries

The principal benefit of the project will be a fully operational NIRS which will supply planting materials to the entire country, conduct irrigated agricultural research with efficiency and contribute to food production, increased incomes and poverty alleviation. An estimated 10,000 smallholder farmers raising irrigated crops on an estimated 30,000 ha will benefit from the activities of the NIRS.

The primary results of the project are:
1. A fully operational NIRS.
2. Well trained personnel conducting research target at all categories of farmers in Zambia – large scale, emerging and smallholder.
3. An efficient flow of certified planting materials and information from the research station – the latter to be incorporated into extension messages.

The farming community will only be secondary beneficiaries of this project. The secondary benefits of the project are expected to be:
1. A wider range of crops to be grown under irrigated conditions.
2. Better yields, higher production and productivity.
3. Improved nutrition and healthy living.
4. Increased incomes and better livelihoods.