MINISTRY OF ENVIROMENT, NATURAL RESOURCES AND REGIONAL AUTHORITIES

Directorate of Regional Authorities

LAKE BASIN DEVELOPMENT AUTHORITY

CONCEPT PAPER ON LBDA PROJECTS

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1 LAKE BASIN HOUSING AND HEADQUARTER DEVELOPMENT PROJECT

1.1 Background Information

1.1.1 As one of the developing countries, Kenya faces a severe shortage of decent housing units for both residential and commercial as the population growth rate has outweighed the rate of development leading to the growth of informal settlements. To address this challenge the Lake Basin Development Authority embarked on a development. The concept to develop affordable houses in the LBDA Region started when the LBDA Headquarters Complex and Residential Housing Project was conceived in 1982.

1.1.2 There exists an acute shortage of decent residential accommodation in the major towns of the Region. This is attributed to the growth of the population which has far outweighed the rate at which housing units are being developed. To address part of the shortage, Lake Basin Development Authority is to construct about 150,000 affordable housing units of mixed development for both low and medium income groups across the Region.

1.1.3 LBDA has carried out extensive feasibility study on this project and is to be implemented in two phases: Phase 1 involves development of residential houses, office park, 5 star hotel and retail mall on two of LBDA parcels of land located at Kanyakwar area of Kisumu County along Kisumu-Kakamega road. Currently the LBDA retail mall is 80% complete. Phase 2 to include the construction of housing units on 3,000 acres across the counties under the LBDA jurisdiction

1.2 Project Purpose

1.2.1 LBDA is keen to engage with various county governments within the region in improving the living standards of the communities in the County through provision of affordable quality housing units, controlled development and rental rates, and provision of capacity building and transfer of the technology.

1.3 Project Objectives

1.3.1 Specific objectives of this project are to:

1) Provide affordable housing units to the community,

2) Fulfill the Government's pledge under vision 2030 of providing 200,000 housing units pa,

3) Improve security services provision due to better planned infrastructure,

4) Reduce pressure on informal housing settlements,

5) Contribute towards control of rental rates by increasing supply,

6) promote community wellbeing through provision of better housing to meet diverse community needs,

7) provide adequate office space for businesses.

1.4 Project Benefits

1.4.1 The economic and social benefits are;

1) Employment creation, especially among the youth,

2) Improved standard of living as a result of decent housing,

3) Elevation of the region as an investment destination of choice,

4) Increased productivity due to conducive living environment,

5) Promotion of planned settlement which leads to easier provision of social amenities,

6) Creation of jobs especially in the construction phase,

7) Increased trade from hotel, Retail mall and office rental business;

8) Improved living standards and improved health from additional incomes.

9) Improved security due to better infrastructural development.

1.5 Methodology

1.5.1 The Authority has been working with a co-developer in funding the investment of the mall.

1.5.2 The Authority to partner with the County government in the feasibility study and to facilitate implementation of the project based on feasibility study findings. The County government to provide land, approve the investment, compensate and relocate any persons or infrastructure affected by the project. The housing units to be sold and revenue injected back for construction of more houses.

1.6 Expected Costs

1.6.1 The estimated cost of the project is approximately Kshs. 25 billion

1.7 County of Implementation

1.7.1 The housing project is to be implemented in each of the counties.

2 MULTI PURPOSE DAMS

2.1 Background Information

2.1.1 In the early 1980s immediately after LBDA was established, the Authority conducted a numbers of studies on sustainable and integrated utilization of the water resources within its area of jurisdiction. In 1985, C Lotti and Associates completed and submitted a report on the 'Lake Basin River Catchment Development - River Profile Studies'. The report identified potential hydropower sites on the major rivers within the LBDA region. Some of these sites included Magwagwa, Nandi Forest and Webuye among other sites for mini hydro power. LBDA already has full feasibility study reports together with ESIA and designs for the construction of two multipurpose dams i.e. Magwagwa and Nandi Forest Multipurpose Dams.

2.1.2 Magwagwa and Nandi Forest Multipurpose projects, which are proposed to contribute to the national socio-economic development. They are multi-sectoral and integrated in nature and are expected to result in increased multiplier businesses effects both at the local and national levels. They target the energy sector, irrigation development, fish farming, water supply and tourism and will make immense contribution towards achievement of Kenya Vision 2030. The two projects mainly involve establishment of large-scale multi-purpose water reservoirs catering for public/industrial water supply, irrigation, river regulation, and flood control and power production (120 and 50MW respectively). Promotion and development of tourism, inter-basin water transfers, fisheries, flood control and downstream ecosystem conservation are also components of the projects.

2.1.3 The Magwagwa Dam the site is located approximately 4 km downstream of the confluence of the Kipsonoi and Yurith tributaries near Magwagwa Town. The Dam and Hydropower Component comprises a 95m high and 450m long concrete faced rockfill dam (CFRD), appurtenant works, and transmission line. A large-scale multipurpose water reservoir (645million cubic meters) catering for Power Production (120MW), Water Supply, and Irrigation to be in place. The reservoir of 17.7 km^2 will be created with an active storage of 445 million cubic meters. The net command area for irrigation is 13,807ha.

2.1.4 The Nandi Dam hydropower project is located in the Yala River basin while the irrigation project is located in the Kano Plains. The project comprises of a 58m high earth/rock embankment dam located in the Nandi Forest. It would impound water with a live storage capacity of 275 Million m^3 and surface area extending to some 12.5 square kilometers. The project will see the irrigation of 16,000- 17,000 hectares of land in Miwani and Chemelil areas of Kisumu County.

2.1.5 The Webuye Dam would comprise a 54m high dam some 2.5 km up the stream of the falls supplying a single 30MW power station by means of a 3000m long 3.4m diameter concrete lined tunnel. The reservoir with a full supply level of 1555m would provide a live storage of 200x106m3, equivalent to 14% of the mean annual flow. The firm yields of this reservoir; net evaporation and anticipated future public water supply requirements would be 17.1 m3/s. A full feasibility study is yet to be conducted

2.2 Project Purpose

2.2.1 The main purpose of the project is to construct multipurpose dams to integrate hydro-power generation, irrigation for agriculture and water provision for industrial and domestic use.

2.3 Project Objectives

2.3.1 The main objectives of these projects are to:

1) Increase the supply of energy in the region.

2) Reduce the country's dependence on imported petroleum energy.

3) Stimulate industrial development in the region.

4) Reduce demand on wood fuel and conserve forests.

5) Alleviate poverty in the region and raise standards of living.

6) Encourage the development of agro-business and agricultural processing plants.

7) Regulate river flow to reduce flooding downstream

8) Promote catchment ecosystem conservation and sustainability.

2.4 Project Benefits

2.4.1 The economic and social benefits from the establishment of the cement factory include;

1) Spurred industrial development from increased hydropower generation,

2) Improved and stabilized energy generation for the downstream Sondu-Miriu and Sang'oro HEP stations,

3) Improved health due to availability of clean portable water,

4) Increased food security from the irrigated agricultural produce,

5) Income generation from establishment of tourism recreation facilities,

6) Reduced environmental degradation due to increased catchment management activities,

7) Improved security due to better infrastructural development,

8) Transfer of cutting edge technology and creation of employment in the power and irrigation sectors,

9) Increased income through agriculture, fisheries and other cottage enterprises,

2.5 Methodology

2.5.1 LBDA to identify and engage private partners through PPP. The partners are to develop and implement the multipurpose dam projects within an arrangement that would enable the partners fully recover their investment. The implementation to be based on the designs and ESIA reports already available.

2.6 Expected Cost

2.6.1 The Magwagwa Dam is expected to cost Kshs 86 billion, Nandi Forest Dam will cost Kshs 55 billion and Webuye Kshs 14 billion.

2.7 County of Implementation

2.7.1 The multipurpose dams will be implemented in:

1) Nandi: Nandi, Kisumu, Vihiga and Kakamega Counties,

2) Magwagwa: Nyamira, Kisumu, Bomet, Homa Bay, Kericho Counties,

3) Webuye: Bungoma, Kakamega and Busia Counties

3 MINI HYDROS

3.1 Background Information

3.1.1 The LBDA region is endowed with rich water resources with six major rivers i.e. Sio, Nzoia, Yala, Nyando, Sondu and Kuja and many small rivers. The Current electricity demand is 2,500 MW and is projected to increase to 15,000 MW by 2030. To meet this demand, Kenya's installed capacity should increase gradually in order to achieve its vision to be an industrialized economy by the year 2030

3.1.2 The Lake basin region is one of the regions in the country which suffer from stifled energy supply which is required to stimulate development. LBDA has developed concept papers and proposals for the construction of eight mini hydroelectric power plants (Yala 1 and 2, Kimothon, Suam Falls, Mubere Falls, Cheptandani, Gogo Falls and Marakwet). This is in a bid to supplement the current and projected demand for electricity in the country.

3.2 Project Purpose

3.2.1 The main purpose is to generate power to be added in the national grid.

3.3 Project Objectives

3.3.1 The objectives of the project are to;

1) Increase supply of electricity in the region with improved dependability, thereby reduce cost of electricity hence affordability by many,

2) Reduce dependability on petroleum based energy, and depletion of natural resources like wood and help in conservation of forests,

3) Spur local socio-economic development through employment and development of related industries;

4) Regulate the River flow hence reduced flooding downstream, and

5) Increase and sustain reliable agriculture in the region.

3.4 Expected benefits

3.4.1 The economic and social benefits of the project include;

1) Creation of employment opportunities for the locals from the construction to the operation phases of the project.

2) Regulation of flow on the downstream thereby reducing the effects of flooding downstream,

3) Increasing of food security for the locals through increased area under irrigation farming.

4) Generation of Hydro-electricity which will spur economic growth.

5) Improved social facilities through the CSR programmes.

3.5 Methodology

3.5.1 The LBDA intends to identify and engage private partners through PPP. The partners are to develop and implement these mini hydro power projects within an arrangement that would enable the partners fully recover their investment. Each mini-hydro's level of viability is to be determined once full feasibility studies are done.

3.6 Estimated costs

3.6.1 Each of the minihydro cost will be guided by the feasibility study.

3.7 County of Implementation

3.7.1 The mini hydro are located in different counties and are proposed for implementation in these counties which include; Trans Nzoia, Kuja Migori, Siaya and Homa Bay Counties.

4 FRUITS AND VEGETABLES PROCESSING PLANT/FACTORY

4.1 Background Information

4.1.1 Horticultural crops have gained prominence in the region over the last ten years. This has been influenced by the fact that horticultural sub-sector is one of the most vibrant sectors in Kenya's economy. Horticultural production in the Lake Basin Development Authority (LBDA) area is undertaken wholly by smallholder farmers who face major challenges including lack of organized markets, postharvest losses, and limited access to value addition technologies.

4.1.2 The Lake Basin Development Authority (LBDA), whose mandate is to promote development of the region, has identified horticultural sector as a potential area to be supported, with an aim of realizing Kenya's Vision 2030.

4.1.3 LBDA has, therefore, identified the fruit and vegetables processing plant as one of the value addition projects that will enhance socio-economic development through the achievement of the Vision 2030 and the LBDA abridged Integrated Regional Development Master Plan while ensuring the farmers gets maximum benefit from their produce.

4.2 Project Purpose

4.2.1 The purpose of this project is to create market for the horticultural produce of small-holder farmers so as to enhance food security and ensure maximized benefits to the farmers through value addition technologies.

4.3 Project Objectives

4.3.1 The objectives of the project are to;

1) minimize post-harvest losses of fruits and vegetables farmers,

2) reduce the exploitation of small holder horticultural farmers by middlemen,

3) scale-down the saturation levels of the market with regard to horticultural crops,

4) stimulate regional trade development.

4.4 Project Benefits

4.4.1 The economic and social benefits of the project include;

1) Enhanced food security,

2) Increased foreign exchange earnings,

3) Infrastructure development,

4) Regional economic development,

5) Creation of both direct and indirect employment opportunities

6) Enhanced income of fruit and vegetables farmers

4.5 Methodology

4.5.1 The project is to be considered for implementation in any of the four zones demarcated within the Lake Basin Region namely; Southern zone, Northern zone, Central zone and Rift Valley zone. The horticultural crops that are targeted for processing are vegetables, groundnuts, sweet potatoes and fruits.

4.6 ESTIMATED COST

4.6.1 The project is estimated to cost a total of Kshs. 1,000,000,000 (Kshs. 1 billion).

4.7 County of Implementation

4.7.1 The fruits and vegetables processing plant project is to be implemented in Kisii County.

5 CEMENT FACTORY

5.1 Background Information

5.1.1 Cement is a key ingredient in the construction industry. The rapid and fast construction currently going on in the country/counties is at pace never witnessed in recent years and has fuelled an ever increasing need for cement. The annual consumption rate for both local and export market is currently 7 million metric tones and is projected to rise at 13% per annum.

5.1.2 Limestone which is the main raw material used in cement manufacture, is available at Homa hills in Homa bay County. Limestone reserve at this location is estimated at 100-150 million tons, and consists of carononatic and calufied limestone. Other services which include water, telephone, electricity and labour are readily available in the area. In addition there is an already elaborate network of distribution and marketing network for the cement products in the region.

5.1.3 The key reasons why this paper seeks the establishment of a cement factory in the region are:

1) The fast growth on the domestic market,

2) The existence of large quantity of raw material suitable for cement production (limestone, clays, sand, iron and gypsum),

3) High export potential to the neighboring countries of Tanzania, Uganda Ethiopia, Sudan, Rwanda and Burundi.

5.2 Project Purpose

5.2.1 The main purpose of the project is to establish a cement plant at Homalime in Homa bay County since the nearest factories are almost 600 Km away and they produce 5 million metric tons of cement.

5.3 Project Objectives

5.3.1 The objectives of the project are to;

1) Enhance production of cement which is prime in the construction industry,

2) Stimulate development in the region,

3) Creation of employment,

4) Maximized controlled extraction and utilization of natural resource.

5.4 Expected Benefits

5.4.1 The economic and social benefits from the establishment of the cement factory include;

1) Enhanced supply of cement at affordable cost,

2) Economic utilization of mineral resources,

3) Increased incomes to the population,

4) Increased decent and affordable houses,

5) Foreign exchange earnings from export sales,

6) Increased revenue generations,

7) Increased employment opportunities; hence poverty reduction.

5.5 Methodology

5.5.1 The project implementation is to be financed by any potential investor and to partner the government of Kenya through the Lake Basin Development Authority and the County Government of Homa Bay. A pre-feasibility study report is ready.

5.6 Expected Costs

5.6.1 Approximated at Kshs 13.5 billion.

5.7 County of Implementation

5.7.1 The cement processing plant project is proposed for implementation in Homa Bay County.

6 BRIQUETTE MANUFACTURING PLANT

6.1 Background Information

6.1.1 The Lake Basin Development Authority (LBDA), whose mandate is to promote development of the region, established a rice mill complex to create market for paddy rice farmers. This project was deemed successful but there was need to scale it up by making use of the rice husks which was being burnt as waste.

6.1.2 This situation led to the inception of a project idea whose goal was to set up a briquette manufacturing plant. The briquettes are to be made by mixing soil and rice husks. The mixture will then be compressed using a compressing machine then dried up. The briquettes are to be used as an alternative energy source for charcoal therefore encouraging the conservation of the environment by alleviating deforestation.

6.2 Project Purpose

6.2.1 The purpose of this project is to conserve the environment by empowering communities through briquette manufacture as a value addition technology.

6.3 Project Objectives

6.3.1 The objectives of the project are to:

1) conserve the environment by alleviating deforestation,

2) enhance the income of rice farmers by adding value to the rice husks,

3) create employment through small and medium enterprises.

6.4 Expected Benefits

6.4.1 The economic and social benefits of the project include;

1) Increased house-hold income,

2) Increased income generation for LBDA,

3) Increased small and medium enterprise start-ups,

4) Creation of direct and indirect employment,

6.5 Methodology

6.5.1 The project aims to use rice husks as well as sugar cane bagasse and water hyacinth as raw materials for the production of the briquettes. The proposed technology to be used in producing the briquettes in called the **screw press.**

6.5.2 The technology will then be transferred to the community in an empowerment program to enable them add value to the agricultural waste generated in their farms while enhancing environmental conservation.

6.6 Estimated Cost

6.6.1 The total investment cost for the project, including working capital, was estimated at Kshs. 100,000,000.00 (Kshs 100 million).

6.7 County of Implementation

6.7.1 The Briquette Processing project is proposed for implementation in Kisumu and Kericho Bay Counties.

7 SAFE DRINKING WATER PLANT

7.1 Background Information

7.1.1 The GOK adopted the global policy of water for all by the year 2000 which was not achieved. Many rural households – over 80% do not have access to clean and potable water. The problem is worse when the role of women in development is taken into account as the time they devote to fetching water could be utilized for income generating activities. Piped water supply system, due to high costs, may not serve the bulk of the rural folks. Coupled with this, most rural household are too poor to afford even the subsidized cost of piped water.

7.1.2 The Lake Victoria Basin of Kenya is a high potential agricultural region endowed with a lot of rainfall (900mm-1800mm annually), however, it has been experiencing reduced access to clean water especially for drinking. The Lake Basin Development Authority engaged Tipets-Abbett-McCarthy-Stratton (TAMS) Engineers and Architectures (1980) and Japanese International Co-operation Agency (JICA) (1990), to carry out studies on how this challenge could be addressed. According to studies, there was confirmed availability of ground resources in the defunct Nyanza and Western Provinces, Bomet, Nandi and Kericho Districts.

7.1.3 Linked to the shortage of clean water is the lack of safe sanitation facilities (latrines) which exposes the rural folks to health hazards – mainly water borne diseases. The combined effect of lack of water and sanitary facilities translates into an unhealthy and therefore unproductive population. Ultimately a people beset by the foregoing problems are unlikely to break the vicious cycle of poverty. The implementation of the proposed programme will therefore help to alleviate rural poverty and subsequently promote socio-economic development of the beneficiary communities.

7.2 Project Purpose

7.2.1 The purpose of this project is to provide safe water for drinking in order to alleviate the effects of water-borne diseases.

7.3 Project Objectives

7.3.1 The objectives of the project are to:

1) Enhance access to clean water for consumption,

2) Reduce cases of water-borne diseases,

7.4 Expected Benefits

7.4.1 The economic and social benefits of the project include;

1) Improved health of the communities

2) Employment creation

3) Improved access to clean water

4) Reduction in water-borne diseases

7.5 Methodology

7.5.1 The project entails the use of filtering techniques and utilization of ultra-violet waves in order to treat the water and rid it of bacteria. The project is to target schools and the community in general.

7.6 Estimated Cost

7.6.1 The estimated cost of the project is Kshs. 100,000,000 (Kshs 100 million).

7.7 County of Implementation

7.7.1 The safe-drinking water project is proposed for implementation in Nandi County.

8 MULTIPURPOSE TRAINING CENTRE

8.1 Background Information

8.1.1 Being the fulcrum of socio-economic development in the Lake Victoria Basin region, part of LBDA's development agenda is to improve the social and economic capacity of the communities living in the lake basin through capacity building programmes, value addition and technology transfer activities. The current constitution dispensation emphasizes on youth and women empowerment. This emphasis arises from the fact that the youth and women hold the potential to spur the socio-economic development of the region and the country as a whole by reducing the unemployment rate through the establishment of small and medium enterprises. However, the youth and women have limited capacity in terms of information access, technology know-how and access to capital.

8.1.2 It is in line with this challenge that LBDA strives to empower the youth and women who form the bulk of the communities in its mandate area. LBDA has been building the capacity of communities through its technology transfer centres located strategically within the seven regions

of LBDA. To start off, the Authority intends to establish one training centre and to be replicated on other zones at a later date. Towards this end, the LBDA seeks to partner with counties in order to identify community needs and establish multipurpose centres to achieve these needs. LBDA has identified Trans-Nzoia County and is working on a joint operational framework towards the development of a multipurpose talent centre.

8.2 Project Purpose

8.2.1 The purpose of this project is to establish a multipurpose training centre so as to build capacity of communities through transfer of technology.

8.3 Project Objectives

8.3.1 The objectives of the project are to:

1) facilitate socio-economic development of communities within the Lake Basin Region,

2) undertake action research for development of innovative methods, processes and practices,

3) create a functional framework that involves relevant institutions towards the achievement of community needs,

4) foster cohesion and integration in the community,

5) nurture the talent of community member.

8.4 Expected Benefits

8.4.1 The expected economic and social benefits are:

1) employment opportunities for those trained,

2) increased household income,

3) establishment of small and medium enterprises,

4) enhanced capacity of the community in socio-economic development,

5) increased access to information and technology,

6) enhanced welfare of the community.

8.5 Methodology

8.5.1 The Lake Basin Development Authority would work in partnership with the relevant departments of the County Governments to identify the needs of the communities within the counties and establish mechanisms and strategies that are geared towards the achievement of those needs. The partnership would also involve relevant institutions on the ground in the identification of needs, the development of mechanisms and strategies and the implementation of the mechanisms and strategies within the counties in the Lake Victoria Basin.

8.6 Estimated Cost

8.6.1 The estimated cost of the project is Kshs. 1,000,000,000 (Kshs. 1 billion).

8.7 County of Implementation

8.7.1 The multipurpose training centre is proposed for implementation in Trans Nzoia County.

9 TECHNOLOGY TRANSFER CENTRES

9.1 Background Information

9.1.1 The transfer centres are at Lichota, Sang'alo, Alupe, Muhoroni, Chwele and Lunyu. The centres require refurbishment for repositioning as cost/benefit centres. These are projects spread out in various locations to provide integrated technology transfer services to the members of the various communities through awareness creation, technical support and demonstration in environment conservation, livestock multiplication, fish farming and bricks production.

9.1.2 The locations are: Kodera and Ndhiwa/Homa Bay County, Sironga/Nyamira County, Borabu/Kisii County, Lunyu/Trans Nzoia County, Kimulot/Bomet County, Lichota/Migori County, Muhoroni and Kibos/Kisumu County, Yala/Siaya County, Alupe/Busia County, Sang'alo and Chwele/Bungoma County.

9.2 Project Purpose

9.2.1 To enhance technology transfer transfer in livestock, fisheries and environment conservation.

9.3 Project Objectives

9.3.1 Improved living standards of the community,

9.4 Project Benefits

9.4.1 Enhance environment conservation and catchment management,

9.4.2 Creation of employment for the community,

9.4.3 Improved food security through adoption of best practice,

9.4.4 Enhanced household food security.

9.5 Methodology

9.5.1 The Lake Basin Development Authority would work in partnership with the relevant departments of the various governments to identify the needs of the communities and establish mechanisms and strategies that are geared towards the achievement of those needs within the centres.

9.6 Estimated Costs

9.6.1 Each centre to cost Kshs 100 million.

9.7 County of Implementation

9.7.1 Homa Bay, Nyamira, Kisii, Kisumu, Trans Nzoia, Bomet, Migori, Bungoma and Busia.

10 INTEGRATED CLIMATE CHANGE ADAPTATION AND MITIGATION

10.1 Background Information

10.1.1 The program involves provision of climate change adaptation services such as construction of water harvesting infrastructures and conservation of catchment areas. It also involves application of Multisectoral integrated watershed Management activities such as establishment of tree nurseries in several pre-selected sites found within the regional units.

10.2 Project Location

10.2.1 Locations are: Homa Bay, Trans Nzoia, Kakamega, Kisumu, Vihiga, Busia, Nandi, Bungoma, Kericho, West Pokot and Bomet Counties. The Outputs are: Water pans, boreholes and tree nurseries for production of seedlings.

10.3 Project Purpose

10.3.1 To enhance environment conservation and catchment management,

10.4 Project Benefits

1) Creation of employment among the youth and women,

2) Diversified revenue generation for the community,

3) Development of soil/water lab to enhance productivity.

11 FEASIBILITY STUDIES - CLAY TILES PROJECT

11.1.1 Production of affordable building materials and ornaments from the natural resources, mainly soil. Location: Homabay, Kisii, Kakamega

11.1.2 Project Purpose

1) Coordinated and controlled exploitation of natural resources.

11.1.3 Project Benefits

1) Increase the supply of affordable building materials hence affordable pricing,

2) Contribute to the growth of the construction industry,

3) Spur economic growth,

4) Improved living standards from increased income levels.

12 DAIRY VALUE CHAIN

12.1 *Market Outlook*

12.1.1 In Kenya, the consumption of dairy products has been increasing rapidly in the country and the trend is expected to continue, especially among the middle urban class populations to reach about 23 million litres per day in 2020 and 28 million litres per day in 2030. Currently, the milk production in the country is estimated at about 5.0 Billion Metric tons of which only 15% is processed. Thus, about 85% milk produced is sold as raw.

12.1.2 Based on the review and estimates by the LBDA Management team, it is projected that a new milk processing plant will target a capacity of about 300,000 liters per day (lpd), which will still supply less than 2% of the projected national milk consumption.

12.2 *Raw Materials (Inputs)*

12.2.1 Milk Supply within LBDA geographical areas would reach about 1.5 million litres per day as per LBDA Records. About 44% of the milk produced is for domestic consumption while 56% is available for sale either through hawking or to formal processors. In the selected radius of 50km around the proposed plant site, a 300,000lpd (8 hour shift) plant will be to obtain raw material it requires to operate successfully. In addition, the Authority will also develop its own steady supply of milk from the nucleus farms at the TTCs. In order to militate against potential milk supply risks, LBDA will institute consumer support services and linkages to enhance farmer relationships. Thus, through these interventions, the Authority will be targeting the development of the entire milk value chain.

12.3 *Transformation (Production Concept)*

12.3.1 The proposed dairy plant will produce a mix of products including milk powder, butter, ghee, whole milk and yogurt among others. The proposed plant will be *located either at the border between Nandi and Kisumu and/or between Busia, Trans Nzoia and Kakamega around the milk supply catchment*. About 10 acres of land is required to set-up the 300,000 lpd plant. Alternative areas such as in Nandi region will be evaluated based on the availability of land and necessary utilities among other factors. LBDA will work with farmer groups or co-operatives to ensure investment synergy, especially in milk collection. Information from the ground indicates that farmers already have basic milk collection infrastructure that will be harnessed to support the project. LBDA will conduct rapid survey of the existing farmer groups and levels of infrastructure investment.

12.3.2 The plant will utilise mixed transport system that will consider direct delivery or milk bulking at milk collection centres before transportation to the plant. The optimal combination of transport models will be evaluated once the final site location is determined. The dairy civil structures will comprise the main block that will house the plant including: Milk reception, milk processing and storage, mill product manufacturing sections, packaging sections, milk pouch, milk product

storage rooms, quality control laboratory, CIP among others. The plant will also have a modern service block to house electrical, boilers and refrigeration systems. Finally, the plant will have auxiliary structures such as reticulation systems, effluent treatment plant, internally paved roads and a perimeter wall.

12.4 *Environmental and Social Considerations*

12.4.1 Detailed assessments of the environmental aspects that may arise from the establishment of the plant will be addressed through a detailed Environmental and Social Impact Assessment report to be submitted to NEMA for approval.

12.5 *Organizational Arrangements and Legal Considerations*

12.5.1 The initiative is proposed to be registered as a commercial venture with other investment partners and/or stakeholders; independently run with its board and management structure, governance and operations.

12.6 *Finance and Economics*

12.6.1 The total initial investment cost for setting-up the dairy plant including working capital and pre-operating costs is estimated at **KES 2.7 Billion as shown in Table 1**. The project returns for the first year of operation have been estimated at KES 810 Million. The figures are under development and will be refined in the business plan document using the latest data being collected. The estimates do not include investment requirements for the establishment of the milk collection centers.

Table 1: Dairy Plant Investment Cost and Projected Returns Summary

Item	*Amount (KES)*
Land and Buildings	200,000,000
Plant and Machinery	400,000,000
Vehicles	25,000,000
Other Fixed Assets	65,000,000
Contingency (10%)	69,000,000
Pre-Operating Costs	100,000,000
Total Capital costs	**859,000,000**
Working Capital levels (for raw milk purchases and operations)	1,850,000,000
Projected net returns (est. at 30% in the first year)	810,000,000

12.7 Implementation Schedule

12.7.1 The project duration is estimated at 27.5 months to commissioning. A comprehensive project implementation framework has already been prepared by the team.

13 FISH VALUE CHAIN

13.1 Market Outlook

13.1.1 The demand for fish and fish products is expected to increase in line with the population and income levels. Trends indicate that that demand for fingerlings has shot from 1 million to 28 million per annum and is expected to peak at 100 million due to growth in the fish industry. In Migori County, for instance, the demand for fingerlings is estimated at 416,000 per annum, whole in Nandi, Trans Nzoia, Busia and Kakamega Counties, the number of farmers with fish ponds is growing each day.

13.1.2 The entry of private commercial farmers in the fish industry further underscores the market potential for fish and fish products despite scanty information on consumption and supply trends. Market intelligence shows that there are very few fish processing plants within the lake basin and the few that exist concentrate mostly in processing captured fish.

13.2 Raw Materials (Inputs)

13.2.1 The raw materials comprise Brooders, Feeds and Water. Feeds will be obtained from Small and Medium Enterprises (SMES), within the region and from own formulation. Water will be sourced from boreholes that will be sunk within the facilities. To mitigate potential raw material supply risks, LBDA will institute consumer support services and linkages to enhance farmer relationships. It is expected that with technical support to farmers and improvement of the TTC and development of a feed processing plant there will be sustainable raw material supply for the investment.

13.3 Transformation (RAS Concept)

13.3.1 LBDA intends to invest across the entire fish value chain. Key areas of investments will include fingerling production, fish production and fish processing (value addition). The proposed sites for setting up aquaponics units are Kibos, Alupe and Borabu. A total of 10 acres will be required to set-up 3 units each comprising a 400,000 fingerling capacity fish hatchery and a 4,000kg/month for table size fish using Recirculation Aquaculture System (RAS).

13.3.2 LBDA will work with farmer groups or cooperatives to upscale production of table-size fish for processing (value addition). LBDA will conduct a rapid survey of the existing farmer clusters to engage and capacity build for fish growing. A direct transport system will be used due to the nature of fish.

13.4 Environmental and Social Impact Assessment Considerations

13.4.1 Detailed assessments of the environmental aspects that may arise from the establishment of the plant will be addressed through a detailed ESIA report to be submitted to NEMA for approval.

13.5 Organizational Arrangements and Legal Consideration

13.5.1 The initiative is proposed to be registered as a commercial venture with other investment partners and/or stakeholders. The organization will be independently run with its board and management structure, governance and operations.

13.6 Finance and Economics

13.6.1 The total initial investment cost of the relating to the development of three production sites including working capital and pre-operating costs is estimated at **KES 555 Million as shown in Table 2**. The project returns for the first year of operation have been estimated at KES 202 Million. The figures are under development and will be refined in the business plan document using the latest data which is being collected.

Table 2: RAS Concept Investment Cost and Projected Returns Summary

Item	*Amount (KES)*
Land and Buildings	45,000,000
Plant and Machinery	180,000,000
Vehicles (specialized)	45,000,000
Other Fixed Assets	30,000,000
Contingency (10%)	30,000,000
Pre-Operating Costs	75,000,000
Total Capital costs	**405,000,000**
Working Capital levels	150,000,000
Projected net returns in the first 12 months (fingerlings and table fish)	202,000,000

13.7 Value addition / fish processing

13.7.1 In the interim period, the Authority will enter into strategic partnerships with the existing fish processing plants, most of which are operating with excess capacity in the counties within the LBDA operational regions. These include plants in Rongo, Kakamega and in Trans Nzoia. In the long term period, the Authority will consider partnering with other relevant stakeholders in a commercial venture to establish a fish processing plant based on the increasing supply.

13.8 Implementation Schedule

13.8.1 The project duration is estimated at 27.5 months to commissioning. A comprehensive project implementation framework has already been prepared by the team

14 ANIMALS FEEDS VALUE CHAIN

14.1 Market Outlook:

14.1.1 Animal feed industry (Livestock and poultry) has a huge potential for investment. With the demand of 650,000 tons against a supply of 400,000 tons, there is a gap of 250,000 tons to be

filled. The demand for animal feed is expected to continue due to growing commercialization of fish farming, poultry production and dairy farming. LBDA wishes to reduce the supply gap through an investment in an animal feed plant capacity of 100 tons per day.

14.2 Raw Materials (Inputs)

14.2.1 The raw materials for the animal feed plant include maize, omena, soyabean, limestone, cotton seed cake, sunflower, cassava among others. Maize or corn which is the main ingredient for the plant will be sourced locally alongside limestone and omena. Other raw materials will be sourced from neighboring countries especially from Tanzania and Uganda.

14.3 Transformation (Production Concept)

14.3.1 LBDA is targeting a whole range of livestock feeds for dairy and fish. Key products to include: dairy Meal and calf pellets for dairy; growers' marsh/pellets for fish. The proposed proportion of feed production per day for each of the targeted animals will be: *Dairy (40%), Poultry (35%), and Fish (25%).* The rations are flexible enough and will be changed based on the established and confirmed market demand. The proposed plant location is Bungoma (Sang'alo). LBDA has land and raw materials are readily accessible. About 5 acres of land is required to set-up the plant.

14.4 Environmental and Social Considerations

14.4.1 Detailed assessments of all the environmental aspects that may arise from the establishment of the plant will be addressed through a detailed ESIA report to be submitted to NEMA for approval.

14.5 Organizational Arrangements and Legal Considerations

14.5.1 The proposed initiative is proposed to be registered as a commercial venture with other investment partners and / or stakeholders. The organization will be independently run with its board and management structure, governance and operations.

14.6 Finance and Economics

14.6.1 The total initial investment cost of the relating to the development of three production sites including working capital and pre-operating costs is estimated at **KES 855 Million**. The project returns for the first year of operation have been estimated at KES 250 Million. The figures are under development and will be refined in the business plan document using the latest data which is being collected.

Table 3: Animal Feeds Plant Investment Cost and Projected Returns Summary

Item	*Amount (KES)*
Land and Buildings	200,000,000
Plant and Machinery	450,000,000
Vehicles	25,000,000

Other Fixed Assets	70,000,000
Contingency (10%)	45,000,000
Pre-Operating Costs	65,000,000
Total Capital costs	**855,000,000**
Working Capital levels	350,000,000
Projected net returns in the first 12 months (30% margin)	250,000,000

15 THE 2ND LBDA INTEGRATED REGIONAL DEVELOPMENT MASTER PLAN

15.1 Background Information

15.1.1 This involves carrying out studies on utilization of natural resources and identification of challenges and opportunities for coordinated development and investment. The Planning emphasis is on how the natural and human resources are harnessed to improve the quality of life of the people.

15.2 County of Location

15.2.1 All the 18 counties

15.3 Project Output

15.3.1 The output are: framework for development, coordinated planning document

15.4 Project Objective

15.4.1 Enhance coordinated development planning,

15.4.2 Enhance sustainable utilization and management of natural resources.

15.4.3 Promote coordinated approach to development among stakeholders,

15.4.4 Promote consensus building on development programmes, policies and priorities at all stages of the economic management cycle.

15.5 Project Cost

15.5.1 the development of the 2nd IRDMP at an approximated cost of Kshs 600 million, 2015-2018