2009

Development of Agri-Logistics Hub In Various Regions of Karnataka

Pre-Feasibility Report

Submitted to

Infrastructure Development Department (IDD), Government of Karnataka.

Submitted By

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1. Introduction

The Indian economy is an agrarian economy in nature with agriculture contributing to approximately 20% of the country's Gross Domestic Product (GDP) and providing livelihood to almost 65% of the population in India. Farming households account for approximately 60% in rural areas and direct income from farming activities accounts for over 50% of farm household incomes. This emphasizes the importance of agriculture and agricultural markets in India. Though India enjoys a leadership position in the production of several agricultural commodities, especially horticultural produce, its share in the global market is minimal due to the lack of competitiveness on cost and quality front.

1.1 Concept of Agri-Logistics cum Terminal Market Centre.

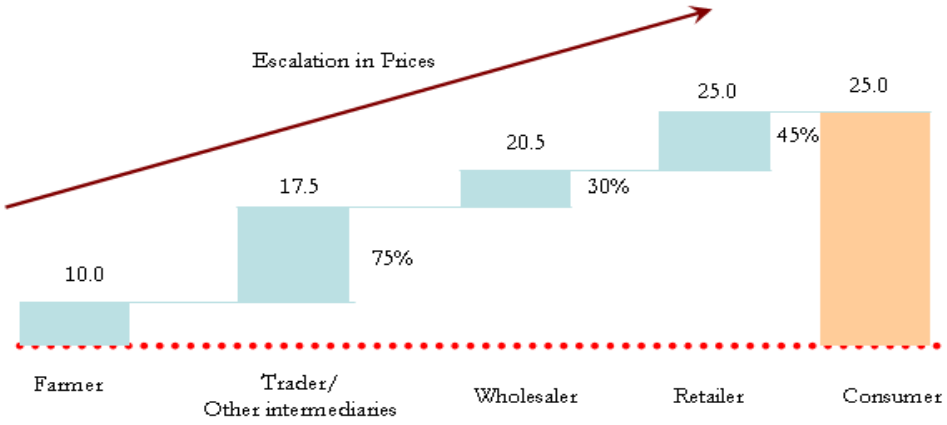
The concept of an Agri-Logistics cum Terminal Market Centre is essentially a strategically located multi-modal logistics platform, allowing efficient hinterland operations by incorporating truck-stop facilities, container cranes and gantries, terminal stacking, warehousing facilities, high end food processing facilities and other value added services. It enables supply chain/ logistics to function much efficiently by removing the cargo bottlenecks in the transit related activities.

1.2 Constraints in Marketing of Agri Produce

a. The agri marketing supply chain prevailing in the country lacks a systematic approach. According to a study on horticultural products by Government of Karnataka (GoK), 75 % of the farmers in the state sell their produce at the farm level. They cannot afford to go to distant mandis on account of lack of facilities, expensive transportation and malpractices in assembling markets. This has resulted in formation of long marketing channels, which has also proved to be detrimental to the quality and safety of the perishable products.

b. The long chain of intermediaries between the farmer and the market, adds cost but no value to the product. The escalation in the cost of the produce is to an extent of 250% of the cost of production at the farm level and same is set out in the figure below.

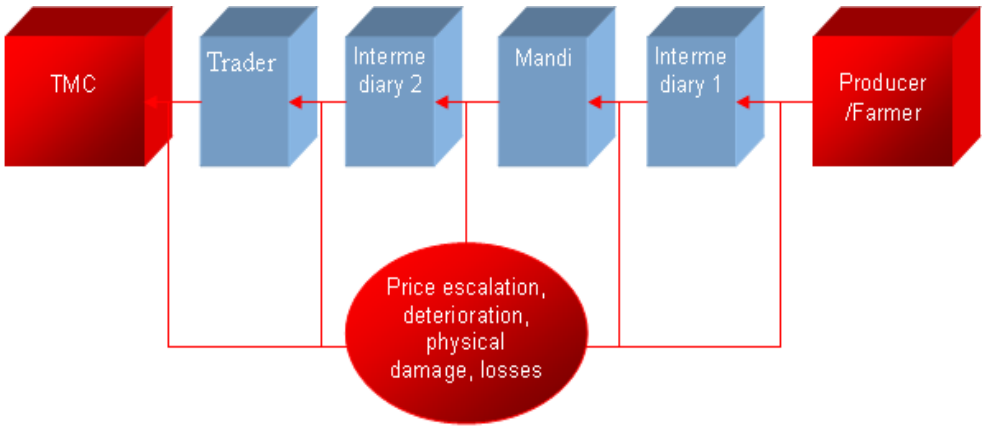
Figure 1: Existing Agro-Market Supply Chain – Escalation in costs



Source: Report on Marketing Reforms and Enhancing Competitiveness, Government of India.

c. It has also blocked the flow of market information resulting in exploitation of the farmers. Poor front end infrastructure such as storage facilities, improper warehousing facilities, redundant food processing technology and the farmers' inaccessibility to the value added services, results in wastage of 40% of the fruits and vegetables. The trading and marketing structure is traditional and consists of a long chain of intermediaries as set out in the figure below.

Figure 2: Agri-supply chain prevailing in the country



Source: Infrastructure Development Corporation (Karnataka) Limited.

d. The disadvantageous position in terms of cost and quality arises from the several constraints that exist in the current system of marketing of fresh produce in the country. Some of them are as set out below.

i. High level of wastages due to lack of proper handling, storage and transport infrastructure.
ii. Lack of grading facilities based on the quality.
iii. Long and inefficient value chain with many intermediaries.
iv. Lack of packaging facilities.
v. Lack of price-sharing mechanism.
vi. Lack of efficient prices discovery mechanism.
vii. Inefficient linkages between the producers and the off-takers (retailers/ institutional off-takers/consumers).

e. The above constraints have an adverse effect on key stakeholders involved in the sector as set out below.

i. Mismatch between demand and supply leading to frequent gluts or short supplies.
ii. Unrealistic prices in the consumer markets.
iii. Lack of adequate incentive to the producers to adopt good management practices (pre and post harvest protocols).
iv. Poor quality of the produce reaching the end consumers.

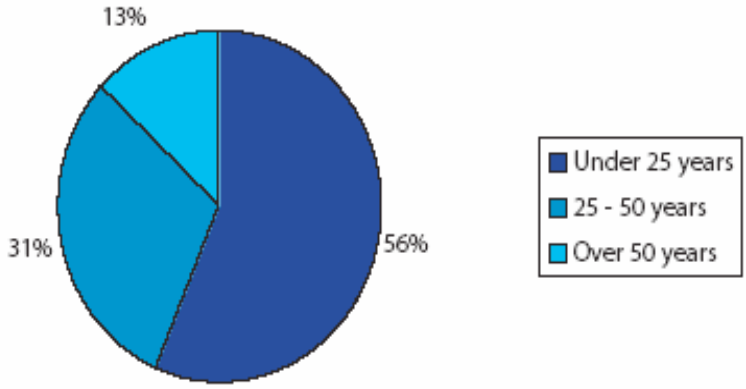
1.3 Changing Demand Scenario

While the supply side of the value chain is marred by the constraints explained above, the demand side has been undergoing rapid changes as set out below.

a. Changing demography

India's population is not only the second largest in the world (approximately 1 billion in FY05), but also is one of the youngest in the world. Those under 25 years of age are estimated to account for 56% of the population (approximately 600 million) and the size of the young population is expected to grow over the next 30 years. The population breakup by age group is depicted in the graph below.

Figure 3: Population breakup by age group



Source: Action Plan of Karnataka.

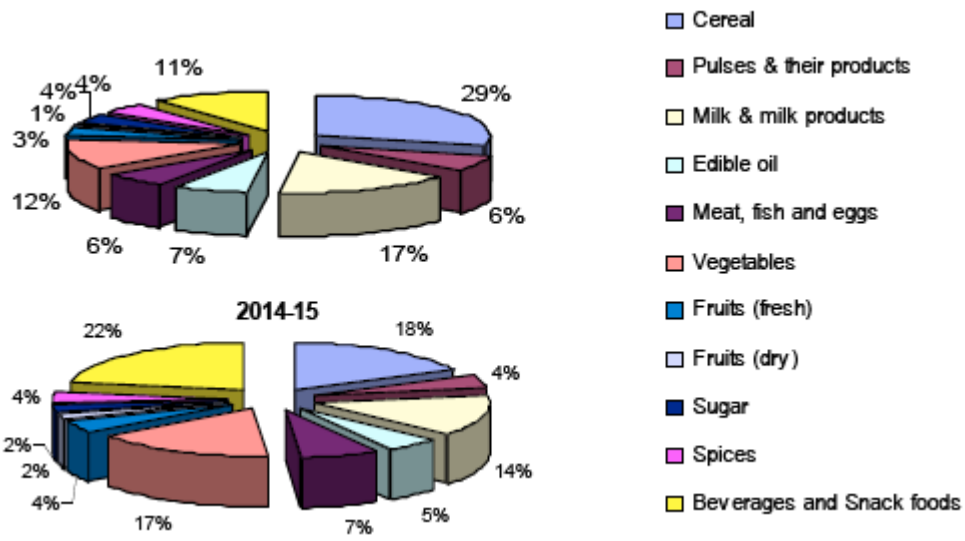
b. Increasing disposal income

The middle and upper class income groups in India are growing faster than the low income groups. Upward mobility of income classes is likely to increase the demand for processed foods as already demonstrated in Europe, United States of America and more recently in several countries in South East Asia. The growth in disposal income in India has grown manifold over the years and is envisaged to grow at a higher rate in the coming years.

c. Changing consumer preferences

The above factors coupled with increased health consciousness of the consumers, have led to a shift in the food preferences of the population. There is reduction in share of cereals and pulses and increase in the share of fruits and vegetables consumption which is in line with the global food trends. The changing consumer food market in the country is depicted in the graph below.

Figure 4: Changing Consumer Food Basket



Source: Action Plan of Karnataka.

In the next development cycle, there is likely to be increasing demand for prepared meals, snack foods and convenience foods, and further on, there will be demand for functional, organic and diet foods.

1.4 Emergence of Organized Retail

Sales through organized food retailing are estimated at Rs. 5000 crores. This has potential to reach a size of approximately Rupees 25000 crores by FY12. Food retailers will play an important role in the food chain which would include;

a. Education and compliance of food standards among food manufacturers;
b. Product innovation;
c. Cost reduction in supply chain through optimum inventory management.

The enormous potential for food retail has led to large corporate houses such as ITC, Reliance, Aditya Birla, etc.; to diversify in a big way in the food retail segment in order to increase the portfolio of offerings to the urban consumer coupled with the assurance of quality and convenience. Very recently, large global retailers such as Wal-Mart and Carrefour have also evinced great interest in participating in this sector through joint ventures and partnerships. This would lead to a greater demand for graded produce in the requisite lot sizes through transparent and competitive system.

1.5 Evolution of Marketing Channels

In order to keep pace with the changes on the demand side, the markets have to evolve rapidly so that the interests of both the farmer and the buyer are taken care of.

The key interests of the farmer are:

a. Realization of a higher percentage share of the consumer rupee.
b. Presence of increased alternatives for the sale of his produce.
c. Provision of better infrastructure for handling the produce.
d. Establishment of a transparent and efficient price discovery system.

The key interests of the buyer are:

a. Availability of graded produce.
b. Availability of quality and hygienic produce.
c. Establishment of a transparent and efficient price discovery system
d. Presence of efficient logistics so as to minimize the wastages during transit services.

1.6 Key Issues

The key issues in the agri-supply chain are as set out below.

a. No assurances to the farmers of acceptable quality and quantity of raw material needed by the processors.
b. Lack of suitable varieties for processing.
c. Attack by endemic diseases.
d. Price fluctuation in vegetable and glut situation which affects farmers.
e. High wastage due to lack of proper post harvest and storage practices.
f. Lack of information in trends of markets and awareness & education for utilization of market infrastructure and post harvest facilities.
g. High transportation and air freights.
h. Limited access to capital, technology, effective management and supporting services such as credit, marketing, research and extension.
i. Very few trained professionals in food science and technology and related disciplines to guide farmers.
j. Less emphasis on product specialization and product quality with the specific objective of securing niches in the domestic, regional and international markets.

k. The chain of intermediaries in the marketing of fruits and vegetables is very long and this leads to very small fraction of every rupee of profit to the farmers.

1.7 Need for Integrated Approach

The need of the hour is a professionally managed competitive alternate marketing structure that provides multiple choices to farmers for sale of produce along with a comprehensive solution to meet key needs of all the stakeholders. A well integrated approach is required to establish efficient linkages between the farmers, village cluster, producer, and the market centre. This would also include reduction in the involvement of intermediaries in the supply chain, which will further expand the markets for primary agricultural products and add value by vertically integrating such services. The issues which have hampered the growth of the sector have resulted in disadvantageous position for all the stakeholders.

Such facilities endeavor to integrate farm production with buyers by (a) offering multiple choices to farmers for sale of produce such as electronic auctioning (b) facility for direct sale to exporter, processor and retail chain network under a single roof. In addition, it also provides storage infrastructure thus offering the choice to trade at a future date to the participants. It is envisaged to offer a one-stop-solution that provides logistics support including transport services & cool chain support and facility for storage (including warehouse, cold storage, ripening chamber, storage shed, etc), facility for cleaning, grading, sorting, packaging and palletization of produce and extension support & advisory to farmers. An integrated facility in terms of a modern Terminal Market Centre with suitable logistics support would address all the issues in the sector and suit the need of the hour.

2. Concept of Agri Market cum Logistics Hub

The concept of an Agri-Logistics Hub (ALH) is essentially a strategically located multi-modal logistics platform, allowing efficient hinterland operations by incorporating truck-stop facilities, container cranes and gantries, terminal stacking, warehousing facilities, high end food processing facilities and other value added services. ALH addresses these issues effectively as they would enable supply chain/ logistics to function much efficiently by removing the cargo bottlenecks in the transit related activities. Integration of such facilities helps in shortening the supply chain for the producers who had to traverse a long marketing channel to reach the market due to unavailability of the necessary infrastructure. From a mere combination of transportation and storage services, agri-logistics is fast emerging as a strategic function that involves end-to-end solutions that improves efficiencies and which would enable apportionment of associated capital costs across a larger base of users leading to significant costs reduction.

2.1 Concept of Agri Logistics Hub (ALH) and its Components

The concept of ALH aims at developing the backward and forward linkages, streamlining the supply chain from farm to market and also to provide value added services to the stakeholders in the value chain. This is to encourage the farmers to move up the value chain by diversifying to higher margin products and ensure that the produce meets end user and market requirements of quality, grades and standards apart from ensuring reliable and un-interrupted supply of adequate volume of produce.

Agri-logistics is an efficient integration of transportation, warehousing, food processing and other value added services enabling value addition at each level of the agri-supply value chain. Warehousing is an important part of this whole system and comprises approximately 20-25% of logistics. Transport comprises 40% of the logistics and the balance is value added services. The facilities that would need to be developed for setting up ALH are as set out below.

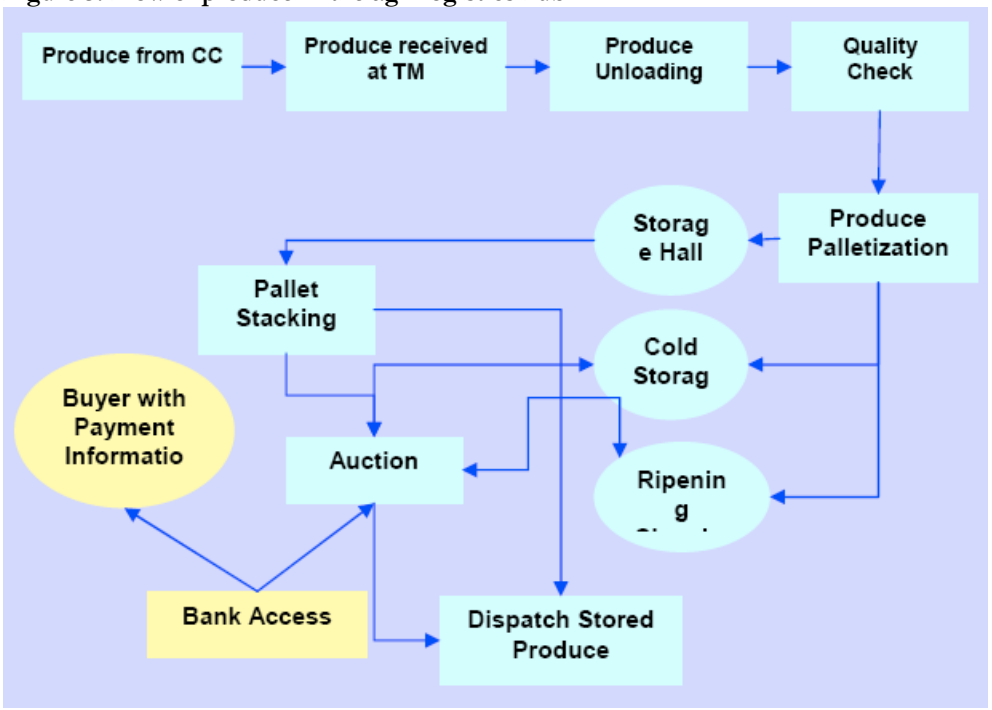
a. Terminal Market Centre (TMC)

Terminal Market Centre essentially comprises warehousing, food processing, logistics services and other relevant value added services. TMCs primarily envisages to meet the objectives by creation of facilities to ensure the following

i. Produce is sorted before it is brought to the market.
ii. Produce is segregated based on quality before sale.
iii. Standard weighment and packaging is achieved.
iv. Accurate price information is shared.
v. Adequate storage infrastructure is created.
vi. Minimal wastage of agri-produce in the transit of the produce from the point of production till the end consumer.

In addition such activities would also reduce seasonality of consumption of the perishable agri products, increase the viability, profitability and sustainability of production systems through their impact on increasing farm incomes, rural employment and foreign exchange earnings, while reducing marketing risks. The typical flow in the TMC is as set out in the diagram below.

Figure 5: Flow of produce in the agri logistics hub



Source: Action Plan of Karnataka.

TMC differs from the traditional wholesale markets in several ways as depicted in the table below.

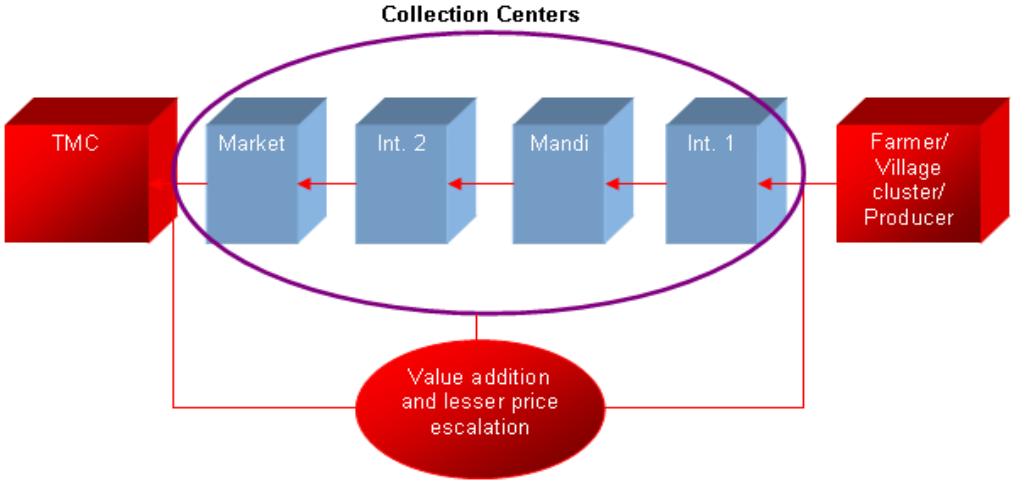
Table 1: Difference of Traditional Market and Modern Terminal Market Centre.

Sr.No	Parameter	Traditional Market	Terminal Market Centre
1	System of Sale and Price Discovery	Non-transparent	Fully transparent
2	Infrastructure	Inadequate	State-of-the-art
3	Backward Linkages	Weak	Integrated with Collection Centers
4	Forward linkages	Through commission agents mainly	Directly linked to retailers, processors and exporters
5	Logistics support (linkages with the hinterland)	No.	Yes
6	Payment solutions	Cash settlement takes 7-30 days	Instant cash settlements
7	Services	Spread out	All under one roof

b. Collection Centre

The central idea of the proposed concept is helping farm earnings grow by shortening of the supply chain, establishing cost effective and standardized linkages. The concept intends to revive market extension activity with re-oriented and appropriate physical infrastructure and technological support.

Figure 6: Curtailment of the Agri Supply Chain



Source: Infrastructure Development Corporation (Karnataka) Limited.

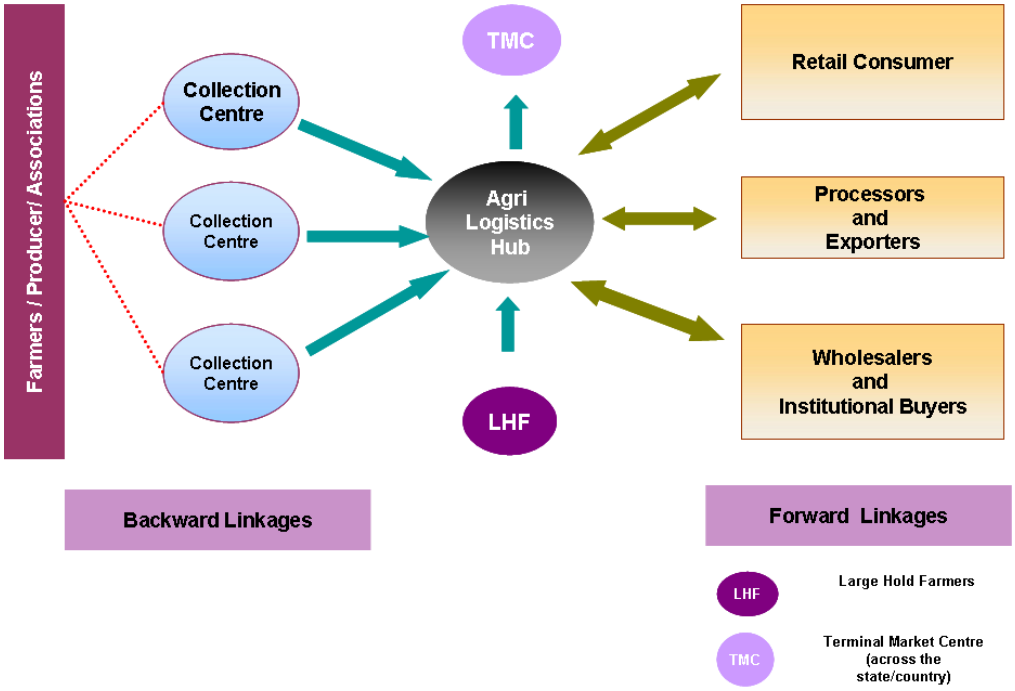
As illustrated in the figure above, the long agri-supply chain could be curtailed if the entire operations of the intermediaries are replaced by "Collection Centers". The collection centres would need to be identified on the basis of expected throughput and logistical feasibility. Development of such nodal collection centers at the taluka/village level would enable collection of farm produce from the cluster of villages, farmers, producers.

The small hold farmers, village clusters and the various other producers could store their farm produce in the nearby village panchayat's storage houses. The function of the collection centres would also include collection of the produce from the village panchayats storage houses and its transportation to the TMC. This would help in shortening the supply chain for the producers who had to traverse a long marketing channel to reach the market due to unavailability of the necessary infrastructure. The collection centres would also function as a cold/dry storage house for horticultural products until the transport fleet reaches the centre for further transportation. This would result in value addition to the farm produce and maximization of the profit for the farmers with minimizing the number of intermediaries.

The collection centres could be located at key production centres to allow easy farmer access and the catchment area of each collection centre is to be based on meeting the convenience needs of farmers, operational efficiency and effective capital utilization of the investment. Further, by adopting the hub and spoke mechanism, these collection centres could be connected directly to the ALH. As illustrated in the figure below, every node in the supply chain i.e. collection centres, large hold farmers, and village panchayats storage house are connected directly to the ALH.

This mechanism would help transporting the farm produce directly to the ALH from the nodal centres through a fleet of transport systems and Information Technology (IT) support systems in place.

Figure 7: Hub and Spoke Mechanism



This mechanism will facilitate smooth flow of farm produce from production centres to the ALH. This will also help shortening and streamlining the supply chain and thereby reducing the losses associated with intermediaries and transportation of the produce.

2.2 Benefits of an Agri Logistics Hub

Agri logistics hub offers several benefits to the different stakeholders in the value chain as follows:

a. Benefits to the Farmers:

i. Farmers get multiple choices for marketing their produce apart from the traditional markets.
ii. Farmers realize the right value for their produce. This is enabled through the assurance of the right price for right quality and correct weighment.
iii. Greater convenience for selling the farmers produce and the cash settlement is also faster when compared to the traditional markets.
iv. Availability of better infrastructural facilities which reduce the wastage of the produce.
v. Minimization of pre and post harvest losses, transit losses and storage losses.

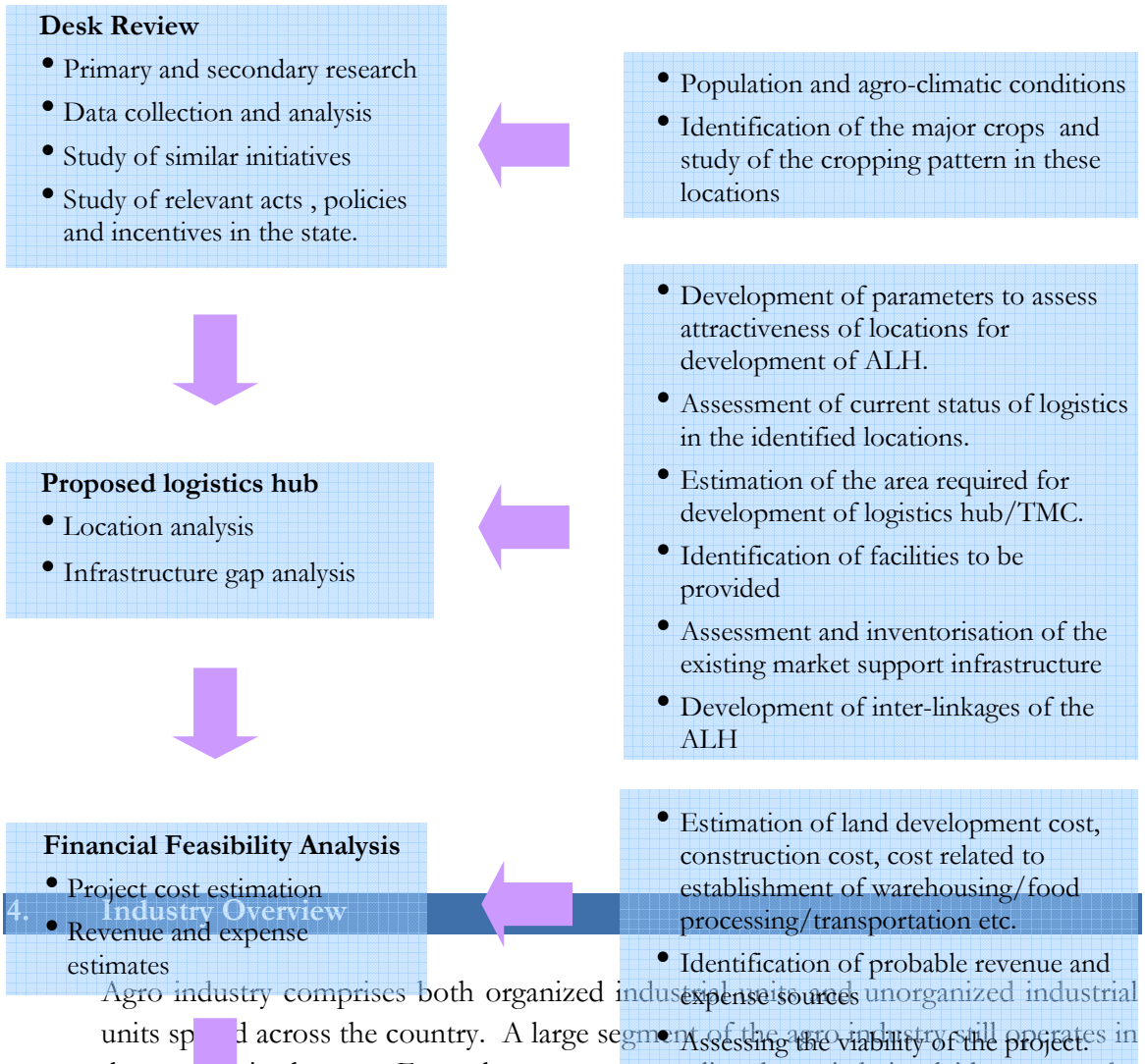
vi. Increased share of the consumer rupee.

b. Benefits to the Buyers

i. Graded and sorted produce is available to the buyer.
ii. Produce in the requisite lot sizes is available as a result of which transaction costs are minimized by avoiding collection/ purchase from a large number of sellers.
iii. Quality and hygienic produce is available to the buyer.
iv. Efficient logistics minimize the wastages of the perishable produce.

3. Approach and Methodology

The approach and methodology adopted in assessing the feasibility of the Agri Logistics Hub in the various regions of Karnataka is as set out below:



4. Industry Overview

Agro industry comprises both organized industrial units and unorganized industrial units spread across the country. A large segment of the agro industry still operates in the unorganized sector. From the recent past, policy thrust is being laid more on the development of agro industry in the organized sector, food processing is one of the growing markets in the world, the reasons being;

a. Increase in per capita income and purchasing power.
b. A largely untapped domestic market of approximately 100 crore consumers.
c. Approximately 30 crore upper middle class consume processed food.
d. Approximately 20 crore more consumers expected to shift to processed food by FY10.
e. Increasing number of working women.

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f. Well developed infrastructure and distribution network.
g. Fast expansion of electronic and print media.

The current scenario with respect to agri logistics in the country is detailed out below.

4.1 Warehousing, Food Processing and other Value Added Services

The warehousing sector within the broader logistics industry for the agricultural sector is expecting huge investment in the future to cater to the large demand of warehousing and related services. As per an industry estimate, warehousing is expected to reach approximately USD 55 billion by FY11, from USD 20 billion in FY08. Moreover, Government of India (GoI) has shown strong focus on this sector in its 11th five year plan such as (a) an in-principle decision to construct approximately 15 million tonnes of strategic storage in various phases (In the first phase, approximately 5 million tonnes of construction is underway), (b) Food Corporation of India (FCI) plans to spend approximately Rs.166 crores for construction of godowns across the state; and (c) Priority sector lending by banks now also includes construction and running of cold storage, warehouses, etc.

Increase in EXIM trade and organized retail business along with several favorable policies such as the introduction of free trade & warehousing zones has meant greater demand for such services in the future. Several organizations are investing huge sums to build such capacities but, they require quality consulting services for effective and efficient execution.

4.2 Food Processing

India has arable land of approximately 184 million hectares and produces annually 90 million tons of milk (highest in the world), approximately 150 million tons of fruits & vegetables (second largest), 485 million livestock (largest), 204 million tons food grain (third largest), 6.3 million tons fish (third largest), approximately 489 million poultry and 45,200 million eggs. India's agricultural production base is enormous; however, processing level is very low i.e. around 2 per cent in fruits and vegetables, 26 per cent for marine, 6 per cent for poultry and 20 per cent for buffalo meat. The share of India's export of processed food in global trade is only 1.5 per cent. Hence, there is immense potential for investment in this sector. Food processing industry can be broadly divided into two groups:

a. Basic and traditional food industries comprising rice milling, wheat milling, dal milling, edible oil, sugar etc.

b. Processed food industries such as biscuits, bakery products, confectionery, vanaspati, meat and fish processing, canning and processing fruits and vegetables, breakfast foods, dairy products including baby foods, starch, malt and maize based products.

Processed foods industry is witnessing exponential growth in the country. The small scale and unorganized sector which constitutes about 70% of the food processing sector and where the bulk of employment lies, suffers from low efficiency due to the lack of access to credit, managerial knowledge, efficient tools / technology, marketing network etc. Intense competition from large scale players have also affected it.

The food processing industry is witnessing a shift from 'supply' to 'demand' driven sector by reducing costs, enhancing quality & safety systems, building, markets, creating and promoting efficient supply chain, developing / inducting world class technology and management and promoting synergy between big and small companies (a large number) for export and employment. It would require single window approach to service all stake-holders engaged in the handing of agri-produce, processing, marketing (including export), infrastructure development, food safety regulation etc.

4.3 Foreign Direct Investment (FDI)

Foreign direct investment (FDI) in the country's food sector is poised to hit the US$ 3-billion mark in the near future. FDI approvals in food processing have doubled in the FY2007. The cumulative FDI inflow in food processing reached US$ 2,804 million in FY2006. In FY2006, the sector received approvals worth US$ 41 million while it was approximately US$ 22 million in FY2005.

4.4 Exports

Exports of food processing products were approximately 20 lakh metric tons worth Rs. 7,500 crores during FY06.

4.5 Other highlights of the sector

Other highlights of the sector are as set out below.

a. The sector lacks sustained investment in planned infrastructure like warehouses, transport centres, integrated cold chains etc.

b. Infrastructure pertaining to cold chain infrastructure is very sporadic and the concept of "Integrated cold chain" is non existent in the country.
c. Major investments on these infrastructures have come from government agencies like Central Warehousing Corporation (CWC), State Warehousing Corporation (SWC), CONCOR etc.
d. Private sector initiatives in the country are small and sporadic.
e. Private sector warehousing is of poor quality, small, fragmented and does not meet the infrastructure standards.
f. No quality standards or benchmarks are followed in infrastructure creation.
g. There is an urgent need to create modern agro warehouses, which would be critical for sustaining for sustaining agriculture.
h. As per Planning Commission, there is a deficiency in the warehousing facilities to an extent of 35 million metric tonnes in next 5 to 10 years and investments in warehousing are expected to grow to an extent of approximately USD 55 billion by FY2011 from USD 20 billion in FY2008.

4.6 Scenario in Karnataka

Karnataka has rich biodiversity and ten agro-climatic zones which can grow majority of the agricultural & horticultural crops. Karnataka contributes around 7% of the agricultural production and 15% of the horticultural production in the country. It contributes around 10% of the fruit & vegetable production in India. Its climate endowment suits cultivation of cash crops like coffee, coconut, mango, spices, commercial flowers, aromatic plants, sugarcane, oilseeds (sunflower), grapes, pomegranate, sapota, etc.. Most of these produce is marketed without any value addition.

Food processing industry in Karnataka, at present, is not commensurate with the potential. Large quantities of agricultural & horticultural produce goes outside the state for value addition. But for the initiatives in traditional food processing units in terms of flour milling, milk processing, oil extraction, distillery & brewery and recent developments in gherkin processing, Karnataka was not in a position to catalyze investments proportionate to the potential (investments in the food processing sector averages less than Rs. 150 crores per annum during the last six years).

Karnataka offers an excellent market for agro food processing companies. Government of Karnataka (GoK) has initiated a number of measures to facilitate and sustain investments at every point in the food chain from producer to consumer. Several major international food companies have located their facilities in Karnataka. These include Nestle, Unilever, Global Green, Danone, Wrigley's, Heinz, Pepsi and Coca Cola, Nissin, Ovobel, among others.

There are investment opportunities commencing with post-harvest management enterprises, value addition through processing, for the manufacture of ready-to-cook, ready-to-eat convenience foods from the variety of vegetables and other agri produce.

4.7 Policy Initiatives of Government and future trend

GoI and GoK are keen on promoting agro and food processing industries. GoI has published draft national food processing policy giving proper thrust and necessary assistance for the growth of this sector. GoK promulgated an extensive industrial promotion policy for agro and food processing industries.

a. Vision and Mission of GoI

To motivate farmers and food processors, provide an interactive coupling between technology, economy and environment and to provide a society for speedy development of food processing industries to build up a substantial base for production of value added agro food products for domestic and export markets. With a strong emphasis on food safety and quality enabling to farmers especially to realize direct benefits of new technology and marketing network, to ensure adequate availability of quality food products for the consumers at economic prices.

b. Policy of GoI.

To fulfill the vision so as to contribute to all round economic and social development of India through generation of employment opportunities especially in the rural areas GoI has initiated major fiscal incentives as set out below.

i. 100% Foreign Direct Investment allowed.
ii. Repatriation of profits is freely permitted.
iii. Most processed food items are exempted from excise duty.
iv. Excise duty exemption for specified cold chain equipments.
v. Customs duty rates have been substantially reduced on plant & equipments / raw materials/ intermediates especially for export production.
vi. No license / permission for import of most capital goods.
vii. Income tax rebate allowed (100% of profits for five years and 25% of profits for the next five years) for new industries in fruits and vegetables.

c. Policy Initiatives by GoK.

GoK has announced industrial promotion policy for agro food processing industries. The main objectives of the industrial promotion policy for agro food processing industries are as set out below.

i. To ensure a better return to the growers and farmers of agriculture and horticulture produce;
ii. To avoid wastage of primary agricultural – horticultural produce in all stages namely pre-harvest and post-harvest including transport and storage;
iii. To make available well balanced and nutritious processed food products to the people;
iv. To tap the full potential of the rich bio-diversity of the state;
v. Augment exports of both primary and processed food products;
vi. To encourage technology up gradation in all stages of food production;
vii. To create brand image for unique agro food products of Karnataka;
viii. To encourage farmers enterprise in all aspects of policy implementation.

d. State Industrial Policy (for period of 5 years starting from FY06 till FY11)

State industrial policy was initiated to promote agro food processing industries in the potential location to help farmers realize better value / price for their produce. Through increase localized processing of agricultural output. As an

incentive for setting up of new agricultural produce processing industries, APMCs in respect of such procurement by the processing industries directly from the farmers will be exempted. Necessary amendments to the existing law will be brought about by the co-operation department in this regard.

5. Overview of the State

Karnataka is the eighth largest state in the country and is located in the southern of India. It has a geographical area of approximately 190 lakh hectares, which accounts for 5.8% of the total geographical area of the country. The state consists of 27 districts with 175 talukas. Karnataka is a maritime state with a coastline of approximately 290 kilometers covering the districts of Uttara Kannada, Dakshina Kannada and Udupi with nine ports including new Mangalore port. Except Karwar, the remaining ports are riverine ports which need to be developed for cost efficient movement of goods. The state has a road length of approximately 1.5 lakh kilometers and a railway route length of 3041 kilometers.

The economy of Karnataka is well diversified and according to the economic survey 2004, Karnataka contributes to an extent of 5.0% to national Net Domestic Product (NDP). Agriculture in Karnataka contributes 27% of the state GDP and employs 71% of total workforce. The land topography is suited for agriculture and 83% of area (soil types) is suitable for agriculture. The state has a high geographical diversity with ten agro climatic zones. The net sown area is approximately 54% of the total geographic area against the national average of 46%. The gross cropped area has exceeded 116 lakh hectares with a cropping intensity of 112%. Small and marginal farmers accounts for 73% of total holdings and 34% of net cultivated land. Though agro climatically suited, water is a main constraint in horticultural development. Irrigation covers 25% of the net cropped area and remaining 75% is rain-fed. Horticulture crop covers to an extent of 15% of the net cultivable area in the state with an annual production of approximately 118 lakh tonnes. Horticulture contributes 40% of the agriculture income and 80% of the agricultural exports.

5.1 Agro climatic Zones

As per the Agro-Climatic Regional Planning (ACRP) of Planning Commission, GoI, Karnataka state falls in zone X (Southern plateau and hills Region) and zone XII (West coast plains and ghat region). Within the state, there are 10 agro-climatic zones. Based on physiographic features, Karnataka can broadly be divided into four regions viz., coastal, Malnadu (hilly), Northern Plateau and Southern Plateau regions. The coastal region lies between the Western Ghats and the Arabian Sea. It is a narrow region with a maximum width of 40 kilometers. It has elevations upto a maximum of 200 meters. The Malnad region comprises steep ranges with valleys and hills running almost parallel to the coast. It is thickly vegetated with evergreen forests and receives moderate rainfall. The Northern plateau region is almost a flat terrain with elevations ranging from 300 meters to 650 meters. It falls in the rain shadow

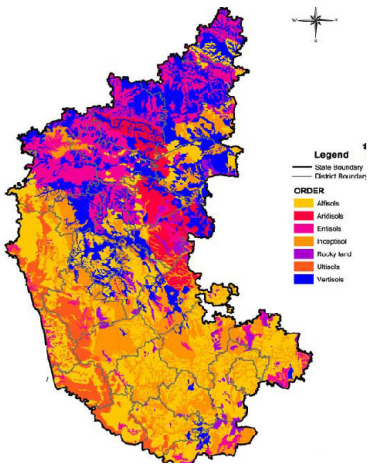
region and is prone to drought. The Southern Plateau region has undulating and rolling topographic features with sporadic hills. It has elevations ranging from 600 meters to 1000 meters. Karnataka has 10 agro-climatic zones and is an ideal place for growing virtually every kind of agricultural and horticultural produce.

a. North Eastern Transition Zone.
b. North Eastern Dry Zone.
c. Northern Dry Zone.
d. Central Dry Zone.
e. Eastern Dry Zone.
f. Southern Dry Zone.
g. Southern Transition Zone.
h. Northern Transition Zone.
i. Hilly Zone.
j. Coastal Zone.

5.2 Soil classification:

Soils in the state have been classified into traditional soil groups namely red soils, laterite soils, black soils, colluvio-alluvial soils, brown forest soils and coastal laterite and alluvial soils. These soils have been further divided into eleven soil sub-groups. Red soils have four subgroups, laterite soils have two subgroups, black soils have three subgroups and alluvial soils have two subgroups. Coastal laterite soils, alluvial soils and forest soils have no subgroups. The details of the same are as set out below.

a. Red soils (Vertisol): Red gravelly loam soil, red loam soil, red gravelly clay soil, red clay soil.
b. Lateritic soils (Aridsol): Lateritic gravelly soil, lateritic soil.
c. Black soils (Inceptisol): Deep black soil, medium deep black soil, shallow black soil.
d. Alluvio-Colluvial Soils (Entisol): Non-saline, saline and sodic.
e. Forest soils (Alfisol): Brown forest soil
f. Coastal soils (Utlisol): Coastal laterite soil, Coastal alluvial soil.



5.3 Irrigation

The normal rainfall in the state is in the range of 1100 millimeters to 1200 millimeters. According to the revised estimate of Central Ground Water Board (CGWB), ultimate irrigation potential in the state through ground water resources is approximately 29 lakh hectares. The ultimate irrigation potential is estimated at approximately 74 lakh hectares including approximately 39 lakh hectares under minor irrigation sector and approximately 35 lakh hectares under medium and major irrigation sectors. The total irrigation potential created in Karnataka is approximately 30 lakh hectares including 20 lakh hectares under major and medium irrigation projects and 10 lakh hectares under minor irrigation projects using surface water resource. The present stage of development of irrigation resources is approximately 40%, thereby indicating the scope for further development of irrigation infrastructure in the state for strengthening and stabilizing agricultural production, especially in the back drop of the prevalent drought situation. Out of the net sown area of approximately 105 lakh hectares in the FY2006, the net area irrigated by all sources was approximately 25 lakh hectares. The major sources of irrigation in Karnataka were canals (38%) followed by wells (19%), bore-wells (18%), tanks (10%) and lift irrigation (4%). Region-wise net irrigated area by various sources in the state is set out in the table below.

Table 2: Region-wise net irrigated area in the state of Karnataka (Area in lakh Hectares)

Region	Canals	Tanks	Wells	Bore Wells	MI[1]	Other sources	Total	NIA[2] as % of NSA[3]
Coastal	—	0.14	0.41	0.03	0.03	0.64	1.25	36.76
Malnad	0.81	1.00	0.05	0.25	0.02	0.21	2.35	22.97
Northern Plateau	5.76	0.51	3.29	1.90	0.80	1.62	13.88	22.64
Southern Plateau	2.95	0.90	1.04	2.31	0.13	0.11	7.44	24.84
Total	**9.52**	**2.55**	**4.79**	**4.50**	**0.98**	**2.58**	**24.92**	**23.76**

Source: Directorate of Economics & Statistics, Bangalore

The trend in proportion of area irrigated by different sources indicates that the proportion of area irrigated through wells to the total net irrigated area (NIA) is approximately 37%, tanks 10% and canals 38%. Erratic monsoon and silting results in unscientific management practices and water scarcity situation in the state. The rehabilitation of tanks in the state requires improvements in the design of tanks and also massive investments through budgetary supports.

[1] Minor Irrigation
[2] Net Irrigated Area
[3] Net Sown Area

Due to the limited availability of water and depletion of groundwater levels in some of the areas, water saving devices like sprinklers and drip irrigation sets, especially in water scarce areas, are likely to play a crucial role in future and need to be promoted to maximize overall productivity. Conjunctive use of water resources coupled with proper drainage system particularly in canal irrigated areas, would maximize the productivity and would also arrest degradation of land due to water logging and salinity.

5.4 Cropping Intensity and Cropping Pattern

The net sown area in Karnataka is estimated to approximately 105 lakh hectares accounting for 54% of the geographical area. Thus, the net sown area as a percentage of geographical area in the state remained near static over the past 28 year period. However, during this period, the net irrigated area as a percentage of net sown area increased from 11% to 24% and the cropping intensity increased by 11% resulting in increase in gross cropped area. This implies the need for more investments in irrigation infrastructure for further increasing the cropping intensity and gross cropped area in the state. Paddy, Ragi, Jowar, Bajra, Maize, Tur, Groundnut, Sugarcane, Cotton, Arecanut and Coconut are some of the major crops grown in the state.

6. Locations for Development of ALH

Project feasibility analysis has been carried out for one location in the state. The methodology adopted for identification of possible locations for development of ALH is discussed in this section.

6.1 Possible Locations for Development of ALH.

The parameters that have been considered for identification of the locations for development of ALH includes (a) yield in the catchment area (b) catchment population to be served and (c) total irrigated land available in the catchment area. The methodology adopted to rank the locations based on the parameters identified is as set out below.

a. The details as mentioned above, have been collated for the districts in the state and the same is set out in the table set out below

Table 3: Details of the various regions in Karnataka

Sr.No	Location (District Headquarters)	Population (lakh)	Irrigated Area (lakh hectares)	Production (lakh tonne)	Yield (Per Hectare)
1	Kolar	25.4	3.6	22.3	6.1
2.	Belgaum	42.1	1.1	9.8	9.2
3.	Haveri	14.4	5.0	13.6	2.7
4.	Bangalore(U)	65.4	2.5	8.0	3.2
5.	Shimoga	16.4	5.0	8.8	1.8
6.	Bagalkot	16.5	3.9	14.6	3.8
7.	Dharwad	16.0	2.6	13.5	5.2
8.	Chitradurga	15.2	3.5	12.0	3.4
9.	Bangalore (Rural)	18.8	3.8	8.1	2.1
10.	Bijapur	18.1	0.9	6.3	7.4
11.	Tumkur	25.8	2.7	7.0	2.6
12.	D.Kannada	19.0	3.2	6.8	2.1
13.	Bellary	20.3	2.7	7.7	2.8
14.	Hassan	17.2	3.1	7.2	2.3
15.	Udupi	11.1	3.6	6.1	1.7
16.	Gulbarga	31.3	1.5	5.3	3.6
17.	Bidar	15.0	2.1	7.3	3.5
18.	Mysore	26.4	1.9	5.6	3.0
19.	Mandya	17.6	1.9	6.8	3.6
20.	C.K.lur	11.4	2.3	7.3	3.2

Sr.No	Location (District Headquarters)	Population (lakh)	Irrigated Area (lakh hectares)	Production (lakh tonne)	Yield (Per Hectare)
21.	Koppal	12.0	2.5	6.7	2.7
22.	C.R.Nagar	9.7	2.0	7.0	3.6
23.	Uttara	13.5	2.6	4.7	1.8
24.	Davanagere	17.9	1.7	5.3	3.2
25.	Gadag	9.7	0.9	4.3	4.7
26.	Raichur	16.7	0.8	3.0	3.9
27.	Kodagu	5.5	1.2	2.5	2.1

Source: Department of Agriculture, Bangalore

a. Relative scores were calculated for each location under each parameter indicated above. The formula utilized for calculating the score is as set out below.

   Relative score for each location under each parameter (S_R): (S_L/S_H *100)

   Wherein,

   S_L : Value of the parameter for the location under consideration.
   S_H: Highest value across all the locations under consideration and for the parameter being considered.

   For example: Calculations of relative score for Belgaum under the population parameter is as set out below.

   i. Population of Belgaum district is approximately 42 lakh (S_L).
   ii. Highest population amongst all the locations listed in the table above is of Bangalore (Urban) and is approximately 65 lakh (S_H).
   iii. Relative score of Belgaum district under population parameter (S_R) = (42/65*100) = 64.5.
   iv. Similarly the relative score of Belgaum under other parameters viz. total irrigated area and the yield of the catchment area is 21.3 and 100.0 respectively.

b. Suitable weightages of 20%, 40% and 40% have been assigned to each of the parameter viz. population, irrigated area available and average yield of the catchment area respectively. Higher weightages have been assigned to the total irrigated land available and average yield of the catchment area as it depicts the potential of the catchment area to serve the capacities envisaged for the ALH and also the growth in demand in the future years. These parameters also represent the quality of essential functionalities (water availability, land quality,

accessibility of the farmers/producers to the technology etc.) of the growth of the agri produce.

c. A composite score is calculated for each of the identified locations based on the formula set out below.

Composite Score (Cs) = Weightages assigned to the parameter X Relative score under each parameter (S_R).

For Example: Calculation of the composite score for Belgaum is as set out below.

i. Relative scores of Belgaum are 64.5, 21.3 and 100.0 under the parameters of population, total irrigated are and yield of the catchment area.
ii. Composite score of Belgaum (Cs) = (64.5*20%+21.3*40%+100.0*40%) = 61.4.

d. The location with highest composite score was ranked the highest and similarly the location with the lowest composite score was ranked last. The ranking of the locations based on the composite score calculated for each of the locations is set out in the table below.

Table 4: Ranking of the locations based on the composite score

Rank	Location	Parameters			Individual score			composite score
		Irrigated Area (lakh hectares)	Population (lakh)	Yield (per hectare)	Irrigated Area	Population	Yield	
1.	Kolar	3.6	25.4	6.1	72.0	38.8	66.8	63.3
2.	Belgaum	1.1	42.1	9.2	21.3	64.5	100.0	61.4
3.	Haveri	5.04	14.4	2.7	100.0	22.0	29.3	56.1
4.	Bangalore(Urban)	2.54	65.4	3.2	50.4	100.0	34.3	53.9
5.	Shimoga	5.01	16.4	1.8	99.4	25.1	19.1	52.4
6.	Bagalkot	3.87	16.5	3.8	76.8	25.3	41.2	52.2
7.	Dharwad	2.58	16.0	5.2	51.2	24.5	57.1	48.2
8.	Chitradurga	3.51	15.2	3.4	69.6	23.2	37.4	47.4
9.	Bangalore (Rural)	3.80	18.8	2.1	75.4	28.8	23.3	45.2
10.	Bijapur	0.85	18.1	7.4	16.8	27.6	81.1	44.7
11.	Tumkur	2.65	25.8	2.6	52.6	39.5	28.6	40.4
12.	D.Kannada	3.17	19.0	2.1	62.9	29.0	23.2	40.3

Rank	Location	Parameters			Individual score			composite score
		Irrigated Area (lakh hectares)	Population (lakh)	Yield (per hectare)	Irrigated Area	Population	Yield	
13.	Bellary	2.74	20.3	2.8	54.4	31.0	30.6	40.2
14.	Hassan	3.14	17.2	2.3	62.3	26.3	25.1	40.2
15.	Udupi	3.64	11.1	1.7	72.3	17.0	18.2	39.6
16.	Gulbarga	1.46	31.3	3.6	29.0	47.9	39.5	37.0
17.	Bidar	2.07	15.0	3.5	41.1	23.0	38.5	36.5
18.	Mysore	1.89	26.4	3.0	37.5	40.4	32.3	36.0
19.	Mandya	1.90	17.6	3.6	37.7	27.0	38.7	36.0
20.	C.K.lur	2.30	11.4	3.2	45.6	17.5	34.6	35.5
21.	Koppal	2.50	12.0	2.7	49.7	18.3	29.3	35.3
22.	C.R.Nagar	1.97	9.7	3.6	39.1	14.8	38.7	34.1
23.	Uttara	2.59	13.5	1.8	51.5	20.7	19.7	32.6
24.	Devanagere	1.65	17.9	3.2	32.8	27.4	35.0	32.6
25.	Gadag	0.91	9.7	4.7	18.0	14.9	51.3	30.7
26.	Raichur	0.76	16.7	3.9	15.1	25.5	42.6	28.2
27.	Kodagu	1.16	5.5	2.1	23.1	8.4	23.4	20.2

e. District headquarters of Kolar, Belgaum and Haveri are the top three ranked locations based on the parameters developed.

f. Bangalore (Urban) acts as a trans-shipment hub for the agri-produce grown in its catchment area, in a radial distance of approximately 100-150 kilometers. Kolar falls in the catchment of Bangalore (Urban) and currently majority of the agri-produce from Kolar is transported to Bangalore markets for further marketing and distribution of the same. Development of ALH in Kolar would not be a viable option. In the light of the same, Belgaum is identified as the pilot location for carrying out the detailed feasibility of the development of ALH.

g. Identification of the crops, project components has been identified for development of ALH in Belgaum. Detailed analysis based on the cost of development, revenues and expenses estimates are discussed in the subsequent chapters.

h. Discussions were held with various stakeholders including government agencies and the list of the same is as set out below.

   i. Director, Department of Agriculture, Bangalore.
   ii. Chairman, APMC, Belgaum.
   iii. Market supervisor, APMC, Belgaum.

iv. Food processing industries in Belgaum.

A pre-investment feasibility studies have been taken up by Food Karnataka Limited (FKL) for development of food park in Belgaum, which is proposed to be a hub for companies to set up individual food processing units. The proposed ALH is different from the food park in many ways including crops / produce to be processed, establishment of linkages with the hinterland, reducing the number of intermediaries, passing higher share of consumer rupee to the farmers, enhanced storage facilities, logistics facilities etc.

During the discussions held with the government agencies, consent was obtained with respect to (a) locations identified for development of ALH and carrying out an analysis for Belgaum as pilot project, (b) products to be handled in the proposed ALH and (c) development of ALH under an appropriate PPP framework.

7. Belgaum District : Pilot Project

7.1 Overview of Belgaum District

Belgaum district is located in the north-western part of Karnataka state. The district is bounded by Maharashtra state in the north, Dharwad & Uttara Kannada district in the south, Bijapur, Bagalkot & Gadag districts in the east and Goa & Maharashtra in the west. The district lies between north altitude 15o-23' to 16o-58' and east at longitude 74o-05' to 74o-28'.

Belgaum district has ten talukas viz., Athani, Bailhongal, Belgaum, Chikkodi, Gokak, Hukkeri, Khanapur, Raibag, Ramdurg and Saundatti. The district has about 1,260 inhabited villages, 54 hoblies & 22 towns. The district has three revenue sub-divisions. Belgaum sub-division covers Belgaum, Hukkeri & Khanapur talukas; Baihongal sub-division covers Bailhongal, Saundatti, Ramdurg & Gokak talukas and Chikkodi sub-division covers Chikkodi, Raibag & Athani talukas. Belgaum has one city municipal corporation, two town municipality, seven municipalities & six town panchayats, one cantonment area and one notified area. Development activities in the district are implemented through zilla panchayat, ten taluka panchayats and 485 gram panchayats.

The population of the district is approximately 42.6[4] lakhs with approximately 32.0 lakh in rural area, average population density is 314 per square kilometers and literacy rate of the district is 64.42%.

The district is endowed with eight rivers and major rivers are Krishna, Malaprabha and Ghataprabha. Two major dams are constructed on Ghataprabha and Malaprabha for providing irrigation facilities. In the district, 51% of the net sown area is irrigated.

7.2 Industries in Belgaum

Belgaum district and the surrounding areas are presently having a range of industries covering engineering, auto ancillary, foundry, food processing, sugar etc. Belgaum has 1,021 small and medium industries with aggregate investment of approximately Rs. 63 crores providing employment to over 7,000 persons. Belgaum has seven mega industries, 34 large & medium industries and 12 sugar factories. Particulars of some of the major agro based industries in Belgaum district are presented in **Annexure 1.**

[4] As per 2001 census

7.3 Road, Rail, Air & Port Connectivity

Belgaum has broad-gauge railway line connecting Bangalore and Mumbai. The nearest airport is at Sambra, 5 kilometers from Belgaum city and at Panaji, Goa, which is at about 160 kilometers from Belgaum City. Sambra airport, Belgaum is a small airport having very limited number of flights operating currently; whereas, Panaji is a bigger airport with comparatively more number of flights in operation. There are two ports close to Belgaum viz. Karwar (170 kilometers from Belgaum) and Mormugao, Goa (160 kilometers from Belgaum).

7.4 Land Utilization

Total geographical area of Belgaum district is approximately 13.0 lakh hectares comprising approximately 2.0 lakh hectares covered by forest (14%), 8.0 1akh hectares net area under cultivation (59%), 1.0 lakh hectares land not available for cultivation (9%), 0.4 lakh hectares under un-cultivated land (3%) and 2.0 lakh hectares fallow land (15%). It could be noted that, out of 8 lakh hectares net area under cultivation approximately 2.5 lakh hectares is used more than once. Thus, in the district approximately 10.5 lakh hectares is used for cultivation.

7.5 Irrigated Area

Net area irrigated in the district is approximately 4.0 lakh hectares, of which, 0.6 lakh hectares by canal irrigation (15%), 1.1 lakh hectares by well irrigation (27%), 1.0 lakh hectares by borewells (24%), 0.5 lakh hectares by lift irrigation (15%) and balance by other sources. Net area irrigated in the district accounts for 51% of net area under cultivation.

7.6 Details of Agriculture & Horticulture Produce in Belgaum District

The production in Belgaum has seen a steady rise in the past few years namely food crops, fruits, vegetables and spices. With the growth in the standard of living of the people the demand for the same has been on a rise too. With the increase in urbanization there is not only demand that has been growing for fruits and vegetables by the household but also by the various retailing giants such as Reliance Retail, Spencer's etc. The demand by the food processing Industries has also been rising for inputs. Packaged food industry has also been a booming industry in India lately and hence there has been a rise in demand for products like juices, spices and ready made food products, have given rise to increase in demand for vegetables like potatoes, fruits like Mango, Banana, and Pineapple and Spices like Ginger. The main crops in Belgaum can be categorized under the following heads:

a. Horticulture Produce

Major horticulture resources in Belgaum district are fruits, vegetables and spices. Minor horticulture resources in the district are garden & plantation crops and flowers.

Major fruits grown in the Belgaum district are banana, papaya, mango, sapota, grapes, citrus fruits, guava, pomegranate, etc. Total fruits production in the district is approximately 2.0 lakh metric tonnes which accounts for approximately 4.0 % of the total production in the state. Major vegetables grown in the district are potato, tomato, cabbage, leafy vegetables, carrot, beans, cauliflower, peas, etc. Total vegetable production in the district is approximately 6.7 lakh MT accounting for approximately 10.0% of the total production of the state. Major spices grown in the district are - chillies, onion, turmeric, garlic, coriander, tamarind, etc. Total production of spices in the district is approximately 1.6 lakh metric tonnes accounting for approximately 3 % of the production of the state. Area & production of various horticulture produces in Belgaum district and Karnataka during 2006-07 are presented in table below.

Table 5: Details on Horticulture Produce in Belgaum District

Sl. No.	Details	Belgaum District		State		% to the State	
		Area (in '000 hectares.)	Prodn. (in '000 MT)	Area (in '000 hectares)	Prodn. (in '000 MT)	Area	Prodn.
I	**Fruit Crops**						
1	Banana	2.1	56.0	60.8	1558.5	3.44	3.59
2	Mango	3.4	42.8	129.1	1368.8	2.64	3.13
3	Jack	6.1	24.3	6.2	249.8	9.74	9.73
4	Sapota	1.7	19.3	26.0	281.9	6.72	6.85
5	Grapes	1.1	18.3	7.8	125.6	14.13	14.56
6	Papaya	1.3	10.5	4.2	314.9	3.24	3.32
7	Guava	3.8	8.9	6.6	128.5	5.79	6.91
8	Citrus fruit	3.0	7.5	10.4	216.2	2.90	3.48
9	Pomegranate	3.2	3.3	12.0	129.5	2.67	2.55
10	Others	2.5	2.5	15.1	362.1	1.63	0.70
	Total I	**10.3**	**193.4**	**278.4**	**4735.7**	**3.72**	**4.08**
II	**Vegetable Crops**						
1	Onion	7.8	155.6	152.3	2721.3	5.11	5.72
2	Tomato	4.7	144.5	46.1	1315.7	10.11	10.98

Sl. No.	Details	Belgaum District		State		% to the State	
		Area (in '000 hectares.)	Prodn. (in '000 MT)	Area (in '000 hectares)	Prodn. (in '000 MT)	Area	Prodn.
3	Green Chillies	7.2	96.8	30.6	378.6	23.6	25.6
4	Potato	4.9	85.8	65.5	682.1	7.5	12.6
5	Brinjal	1.6	51.8	19.2	467.9	8.3	11.1
6	Khol Varieties	1.9	39.8	13.1	260.5	14.2	15.3
7	Green leaves	1.6	17.3	17.1	155.9	9.4	11.1
8	Sweet Potato	1.2	14.7	3.1	39.1	39.1	37.7
9	Gourd varieties	9.3	12.2	16.1	247.9	5.8	4.9
10	Others	4.3	59.1	48.7	748.8	8.8	7.9
	Total II	**36.1**	**677.7**	**412.0**	**7017.8**	**8.8**	**9.7**
III	**Spice Crops**						
1	Turmeric	1.0	6.2	12.7	82.4	7.9	7.5
2	Garlic	0.8	5.5	5.2	43.2	13.2	12.6
3	Dry Chillies	2.6	2.9	137.9	164.3	1.9	1.8
4	Tamarind	2.0	1.0	15.7	80.0	1.3	1.2
5	Ginger	0.1	0.7	20.5	198.1	0.3	0.4
6	Coriander	0.5	0.2	8.8	9.6	4.7	2.4
7	Others	0.01	0.3	44.4	26.3	0.1	0.01
	Total III	**7.0**	**16.4**	**245.1**	**604.1**	**2.0**	**2.7**
IV.	**Other Garden / Plantation Crops**						
1	Cashew	5.4	8.2	69.6	122.3	7.8	6.7
2	Betel vine (lakh nos.)	0.2	4.4	6.8	129.5	3.3	3.4
3	Coconut (lakh nos.)	3.3	0.4	467.6	103.2	0.7	0.4
4	Areca nut	0.03	0.04	200.7	308.6	0.01	0.01
	Total IV	**8.9**	**8.4**	**764.6**	**469.1**	1.3	1.8

b. Agriculture Produce

Major agricultural crops grown in the district are sugarcane, maize, jowar, groundnut, wheat, etc. Total agriculture production in Belgaum district is approximately 125 lakh metric tonnes accounting for approximately 16.0 % of the total production of the state. Area and production details are set out in the table below.

Table 6: Details on Agriculture Produce in Belgaum District

Sl. No.	Agriculture Crops	Belgaum District		State		Percentage	
		Area (in '000 ha.)	Production (in '000 MT)	Area (in '000 ha.)	Production (in '000 MT)	Area	Produc-tion
1	Sugarcane	93	8,214	221	19,648	41.98	41.81
2	Maize	275	973	1,872	5,613	14.70	17.33
3	Paddy	134	438	2,970	11,992	4.50	3.65
4	Jowar	401	328	3,040	2,958	13.18	11.09
5	Wheat	126	131	505	453	24.96	28.99
6	Cotton	28	42	413	585	6.86	7.15
7	Soyabean	69	38	133	75	51.79	51.17
8	Groundnut	74	37	1,040	596	7.10	6.23
9	Bengal Gram	49	25	418	238	11.71	10.35
10	Tobacco	20	22	101	64	19.95	33.91
11	Bajra	55	21	862	781	6.39	2.75
12	Sunflower	43	19	1,427	668	3.03	2.89
13	Safflower	10	7	81	62	11.94	11.37
14	Others	1,390	2,163	20,637	34,822	6.74	6.21
Total		**2,767**	**12,458**	**33,720**	**78,555**	**8.21**	**15.86**

Source: Department of Horticulture & Agriculture, Bangalore

Thus, it could be observed that, Belgaum District has adequate quantity of horticulture & agriculture produce for further processing and value addition.

8. Proposed Agri-Logistics Hub in Belgaum

Project profile, physical parameters, rationale for design, description and configuration of various facilities proposed to be developed in the ALH in Belgaum are described in this section.

8.1 Project Description

The proposed ALH will have state-of-the-art facilities, at par with the best in contemporary international scenario, duly adapted for local conditions. The project will address complete backward and forward linkages from farmers to the consumers. The TMC will be equipped with facilities for warehousing, food processing, cold storages, central auctioning, ripening chambers, quality control laboratories, ne stop shopping for input, agri- clinic and extension services, information kiosk etc. The TMC will be further linked to the collection centres at the taluka level through a efficient fleet of transportation facilities.

8.2 Products to be handled

Methodology adopted for identification of the products to be handled in the ALH is as set out below.

a. The agricultural and horticultural produce has been categorized under broad categories as set out below.

   i. Fruit crops
   ii. Vegetable crops
   iii. Spice crops
   iv. Other garden/plantation crops
   v. Foodgrains/other agri produce

b. Identification of the agricultural and horticultural produce to be handled in the proposed ALH is based on the following factors.

   i. Total production in the catchment area.

      Details on production of all the produce under each category cultivated in the catchment area of Belgaum district were analyzed so as to understand the cropping pattern of the catchment area.

ii. Total marketable surplus (existing intake in the APMC yard of Belgaum). Details on the intake of all the produce in the APMC yard of Belgaum was analyzed so as to ascertain the market surplus availability of the produce in the catchment area of Belgaum, which could be routed through the proposed ALH for further processing and value addition activities.

c. Based on the above parameters, top 5-6 products under each category to be handled in the proposed ALH were selected to ascertain the capacities of the project facilities proposed to be developed in the ALH. The indicative list of agricultural and horticultural produce identified based on the parameters mentioned above is as set out in the table below.

Table 7: Produce to be handled in the proposed Agri Logistics Hub.

Sr.No	Particulars	Production Details		Marketable Surplus
		Area in Hectares	Production in Metric Tonnes	Metric Tonnes per annum
A	**Fruit Crops**			
1	Banana	2,094.0	56,015.0	158.2
2	Mango	3,407.0	42,813.0	3,368.0
3.	Sapota	1,749.0	19,298.0	1,929.8
4.	Grapes	1,095.0	18,284.0	1,828.4
5	Papaya	137.0	10,463.0	1,046.3
	Total (A)	**8,482.0**	**146,873.0**	**8,330.7**
B	**Vegetable Crops**			
1.	Onion	7,782.0	155,644.0	66,071.2
2.	Tomato	4,654.0	44,502.0	550.0
3.	Green Chillies	7,237.0	96,786.0	3,486.6
4.	Potato	4,880.0	85,770.0	63,138.1
5.	Brinjal	1,604.0	51,838.0	5,183.8
	Total (B)	**26,157.0**	**434,540.0**	**138,429.7**
C	**Spice Crops**			
1.	Turmeric	1,001.0	6,165.0	616.5
2.	Garlic	5,466.0	5,466.0	546.6
	Total (C)	**6,467.0**	**11,631.0**	**1,163.1**
D	**Other Garden / Plantation Crops**			
1.	Cashew	5,439.0	8,226.0	822.6
2.	Coconut	3,280.0	377 lakh units	123,538.3

Sr.No	Particulars	Production Details		Marketable Surplus
		Area in Hectares	Production in Metric Tonnes	Metric Tonnes per annum
	Total (D)	**8,719.0**	**8,226.0**	**124,360.9**
E	**Foodgrains/Others**			
1.	Maize	93.0	384,210.0	101,678.5
2.	Rice	134.0	16,390.0	7,812.9
3.	Jowar	401.0	42,480.0	4,075.4
4.	Sugarcane	93.0	8,214.0	1,500.0
5.	Cotton	28.0	8,361.0	2,000.0
	Total (E)	**749.0**	**459,655.0**	**117,066.8**

8.3 Project Components

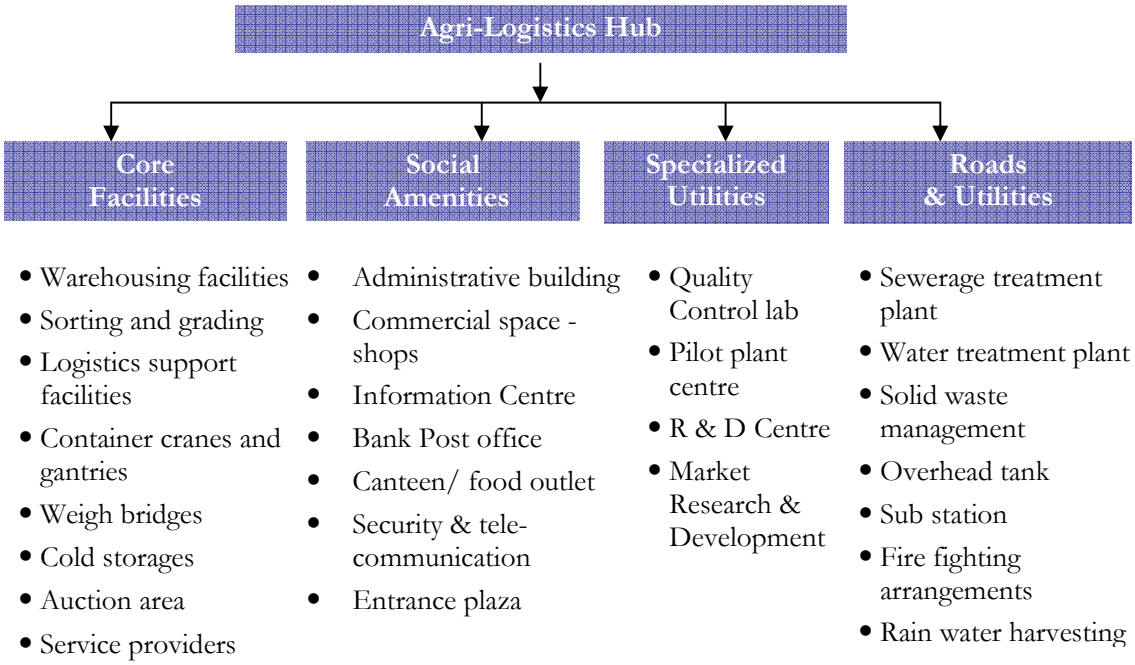
Adequate infrastructure needs to be provided at the ALH to facilitate smooth operation of the market and uninterrupted marketing of the horticultural produce. The market infrastructure proposed for the ALH is discussed below:

a. Terminal Market Centre

The facilities to be provided in the TMC are categorized under 4 broad categories viz.

i. Core facilities.
ii. Social amenities.
iii. Specialized utilities.
iv. Roads and other utilities.

The facilities that would be housed in each of these categories are set out in the diagram below.



Based on the production of major crops, following is the infrastructure requirement and specific infrastructure requirement for identified crop for food processing.

Table 8: Specific Infrastructure Requirement for the proposed ALH.

Sr.No	Particulars	Warehouse	Cold Storage	Sorting and Grading	Ripening chamber	Weigh Bridge
A	**Fruit Crops**					
1.	Banana	✔	⊘	✔	✔	✔
2.	Mango	✔	⊘	✔	✔	✔
3.	Sapota	✔	⊘	✔	⊘	✔
4.	Grapes	⊘	✔	⊘	⊘	✔
5.	Papaya	⊘	✔	✔	⊘	✔
B	**Vegetable Crops**					
1.	Onion	✔	⊘	✔	⊘	✔
2.	Tomato	✔	⊘	✔	⊘	✔
3.	Green Chillies	✔	⊘	⊘	⊘	✔
4.	Potato	✔	⊘	✔	⊘	✔
5.	Brinjal	✔	⊘	⊘	⊘	✔
C	**Spice Crops**					
1.	Turmeric	✔	⊘	⊘	⊘	✔
2.	Garlic	⊘	✔	⊘	⊘	✔
D	**Other Garden / Plantation Crops**					
1.	Cashew	⊘	✔	✔	⊘	✔

Sr.No	Particulars	Warehouse	Cold Storage	Sorting and Grading	Ripening chamber	Weigh Bridge
2.	Coconut	✔	⊘	⊘	⊘	✔
B	**Foodgrains/Others**					
1.	Maize	✔	⊘	✔	⊘	✔
2.	Paddy	✔	⊘	✔	⊘	✔
3.	Jowar	✔	⊘	⊘	⊘	✔
4.	Jaggery	✔	⊘	⊘	⊘	✔
5.	Cotton	✔	⊘	⊘	⊘	✔

The following table sets out the capacity requirement of each of the infrastructure facilities required in the ALH. These capacities are based on the marketable surplus of crops in the catchment area.

Table 9: Capacity Requirement of the Infrastructure Proposed.

Infrastructure Requirement	Crops	Capacity required
Warehouse	Banana, Mango, Sapota, Onion, Tomato, Green Chillies, Brinjal, Turmeric, Maize, Paddy, Jowar, Jaggery and Cotton.	1200 metric tonnes
Weigh bridge	All crops	50 trucks per day
Grading –sorting	Banana, Mango, Sapota, Papaya, Onion, Tomato, Turmeric, Maize and Paddy.	Banana: 3 tonnes per hour Mango: 3 tonnes per hour Sapota: 3 tonnes per hour Papaya: 5 tonnes per hour Onion: 10 tonnes per hour Tomato: 3 tonnes per hour Potato: 10 tonnes per hour Maize: 10 tonnes per hour Rice: 5 tonnes per hour
Cold storage	Grapes, Papaya, Garlic, Cashew and Mango.	250 metric tonnes
Ripening Chamber	Mango and Banana	15 tonnes per day.

The details on the components of the TMC are as set out below.

i. Auction cum Display Area

The auction facility will be the corner stone of the proposed TMC. The system will provide transparent price setting mechanism and opportunity for farmers to sell their produce directly without involving the intermediaries.

The existing system is dependant on the commission agents including all the players in the chain (such as farmers, sub-wholesalers, retailers etc.). The monopolies enjoyed by the commission agents give rise to many malpractices, witnessed in the present market system. As a result the price setting is not transparent and the farmers do not get a fair deal. Therefore, to overcome these difficulties, it is proposed to establish a central auction in the TMC. A professional team under the direct control of the market will carry out the auction. This will further ensure transparent price setting mechanism and will provide alternative marketing channel to the growers.

ii. Warehousing

It is proposed to set up a warehouse equipped with state of art material handling systems, with forklifts and trolleys to move the goods inside and very good facility for the packaging / repackaging of goods. The warehouse would be of a capacity of approximately 1200 metric tonnes covering an area of approximately 1.7 lakh square meters.

iii. Shop Space

Necessary infrastructure would be developed to help in creating business opportunities for wholesalers/traders. This space will provide shops and premises to stakeholders like commission agents and wholesalers. Main features of this area will be:

- The market will be fully equipped for efficiently carrying on wholesale activities.
- Principally, commission agents and traders are to be accommodated in the TMC. However, big traders from other markets will also be attracted to set up business here.

The shops have been designed to receive large volumes from suppliers (farmers and traders in other markets). Each shop will have sufficient space

to create additional infrastructure facilities for storage, sale, packing, display etc.

The width of each shop has been envisaged as 12 X 8 meters in view of the fact that the docking space for a big truck is 3 meters to 3.6 meters. Two trucks can be simultaneously docked for loading/unloading.

iv. Weigh Bridge

The vehicles entering and exiting the TMC need to be weighed for obtaining the gross weight so that weight of the produce can be measured. For this purpose, 2 electronic weighbridges have been suggested at the entry and exit of the TMC. Also, digital weighing scales would be provided inside the TMC for weighing the produce.

v. Loading, Unloading & Dispatch section

For facilitating unloading of the vehicles bringing the produce and loading of the vehicles taking the produce from the market, loading and unloading docks of 45000 square meters area are proposed.

vi. Cleaning, Sorting & Grading Facilities

Grading is the key to fair price setting and better realization. However, at present, farmers do not grade their produce. Ideally the grading is best done at the farm / collection centre level so that only good quality produce is sent to the market for sale and unnecessary transport cost on poor and damaged produce is not incurred. Such an arrangement would also reduce garbage generation in the TMC.

Farmers would need to be educated to bring graded produce to the market, which may take sometime. TMC will therefore comprise grading facilities as enabling service for benefiting farmers. The produce arriving directly at the market will be sorted and graded before being sent out of the TMC. It will also increase the efficiency so that more quantity of the produce can be handled in the shortest possible time.

vii. Cold Storage

Fruits and vegetables need to be stored in either controlled atmosphere storage house or cold storages to prevent deterioration in the quality and to increase shelf life. Farmers/producers can store their produce in cold storage/ controlled atmosphere storage during the glut season when prices are low and can sell it during lean season when the prices are high. For this, a cold storage of capacity of 250 metric tonnes is proposed to be provided. The unsold quantities of fruits and vegetables can be stored in the cold storage, if required.

viii. Quality Testing Facility

A quality testing lab is proposed to ensure that the produce is distinguished on quality basis so that the better quality produce can get a higher price. Quality control is one of most crucial functions in a modern wholesale market covering post-harvest activities, public health, classification and standardization of the produce and administering complaints' redressal system. The major functions of this lab will be:

- Development of quality standards, grades, packaging etc.
- Inspection of cargo for classification and grades.
- Introduction of quality assurance systems.
- Training of the field staff and farmers on grading, sorting and packaging
- Co-ordination with other markets and national organizations for developing grades and standards.
- Study of consumers' preferences; research and development on growing, varieties, and quality parameters

ix. Material Handling Equipment

In order to increase the efficiency of operation and reduce the level of manual handling, material handling equipments like hydraulic trucks, battery operated forklifts, weighing scales, box strapping machinery and brand hydraulic pallet lifting truck will be provided. Small material handling equipments like chain pulling, wire rope, chain electric, traveling trolley, worm gear, gantry crane, tripod, crab winch and jib crane will also be provided.

x. Information Centre

An information centre will be developed in the administrative block. This information centre could be connected to the networks of the National Horticulture Board and other such associations. As such the price and arrival information of all horticultural commodities in important markets of state and the country could be made available. In addition, the information will also be available in the information kiosks to be established in the commercial complex. The TMC could provide right of linkages through internet to the growers as well as traders.

b. Collection Centres

Initially, the catchment area of the ALH in Belgaum is envisaged to be within the limits of the Belgaum district. Eight collection centres have been proposed to be set-up in the catchment area to:

i. Facilitate consolidation of produce near the production areas.
ii. Provide common infrastructure for post harvest treatment.
iii. Improve quality of the produce for the consumer.
iv. Increase life of the produce by providing packing facilities.
v. Reduce garbage generation in the TMC.
vi. Disseminate Information and provide crop advisory services to farmers.

Location of Collection Centres

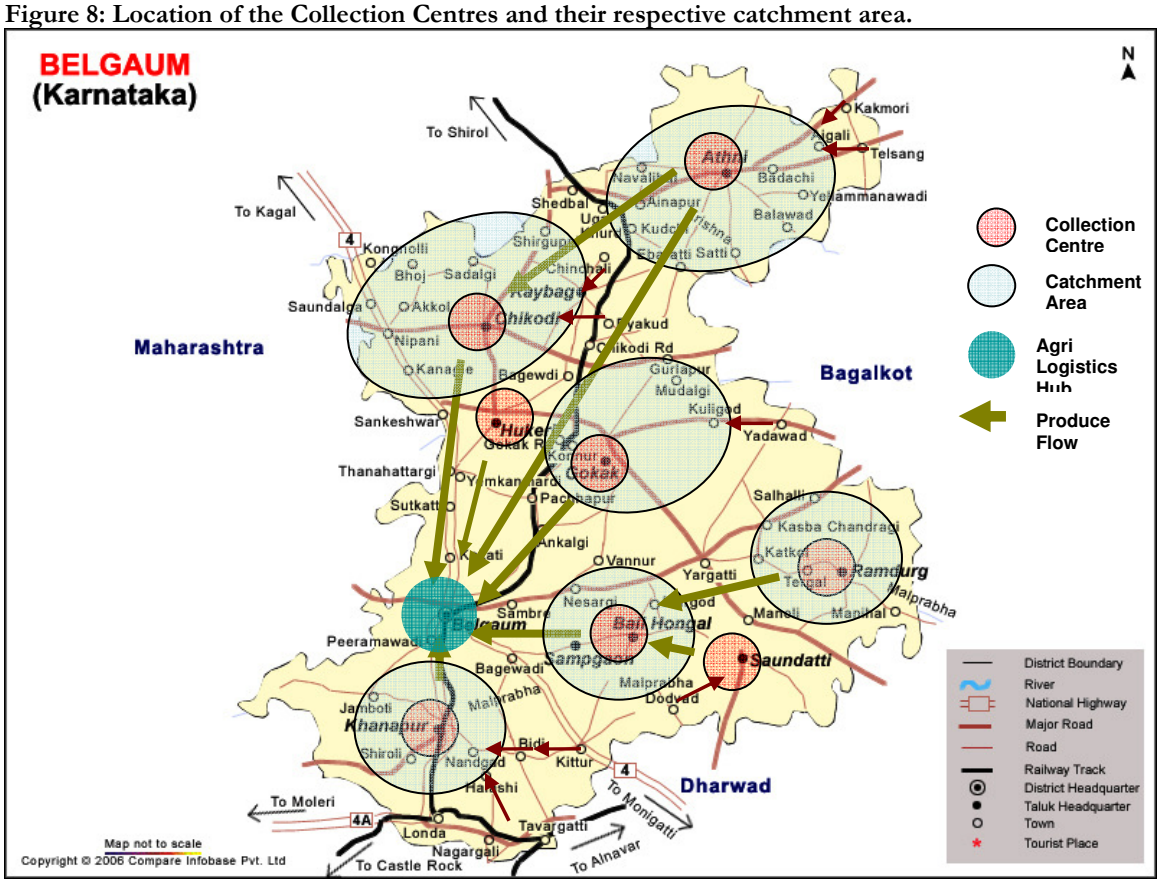
The collection centres are proposed to be set-up at the taluka level and following locations have been identified for the same.

Table 10: Details on the Collection Centres identified.

Sr.No	Location	Distance from the Agri Logistics Hub (kilometers)
1	Athni	175.0
2	Bailhongal	55.0
3	Nippani	100.0
4	Gokak	60.0
5	Hukeri	70.0
6	Khannapur	26.0
7	Saundatti	85.0
8	Ramdurg	135.0

The location of the collection centres is depicted in the figure below.

Figure 8: Location of the Collection Centres and their respective catchment area.



The collection centre offers highest handling capacity in terms of per hour inflow of the products at its peak. The collection centre would on an average handle approximately 50,000 metric tonnes of produce per annum, with the peak inflow of about 400 metric tonnes per day with handling at about 40 metric tonnes per hour. It will have the facility of washing and optional grading/packing of the produce before sending to the TMC.

The farmers will bring the produce to this centre and handover the same indicating his preference for the TMC. The transport fleet would carry the produce from the collection centre to the TMC. The details of the arrivals in the catchment are as set out in the **Annexure 2.**

Activities at Collection Centres

Activities at the Collection centres would include the following:

i. Farmer Registration
ii. Receiving produce from farmer/other producer.
iii. Consolidation of produce and dispatch to TMC.
iv. Payment to farmer/ producers.
v. Training to farmers.

Collection centre would be at a place which is surrounded by maximum number of villages where key fruits and vegetables are grown and it should have proper road connectivity.

Infrastructural facilities at Collection Centres

The infrastructural facilities to be provided at collection centres are:

i. Washing, Grading, Sorting, Weighing Services

As the farmers' produce reaches the market, it will be weighed, graded and sorted manually and then the produce will be transported to the TMC.

ii. Transport Services

Farmer's produce will be transported to the TMC in refrigerated vehicles so as to prevent deterioration in quality of the agri produce

iii. Banking Services including Settlement of Payment

Banking and ATM facilities shall be provided at the collection centres. As soon as the produce of the farmer is sold, the money is transferred to the farmer's account.

c. Logistics Support Facilities

Logistics support facilities mainly provide direct logistics services in the form of truck parking and support services of fuel pump, service center, driver dormitories, offices etc. This zoning and bundling of services has been suggested keeping in view the ease of functionality. Broadly, the following support facilities could be developed.

i. Transport Fleet

Trucks would be required to transport the agri produce from the collection centres to the TMC. For this purpose, following trucks are proposed to carry out such services.

- Refrigerated trucks: 15 trucks.
- Transport trucks: 62 trucks.

ii. Parking facilities

Parking facilities for idle truck, needing to stay due to non-availability of loads is proposed to be developed. For the same, an area of 15000 square feet has been earmarked, wherein 15 trucks can be parked at any given time. It is also proposed to locate the office of freight forwarders in the same complex, as they normally liaise with the industry for loads. The transporters can also locate their liaison offices in the same complex for the ease of functionality.

iii. Driver Dormitories

In keeping with the anticipated vehicle inflow to the parking each day, provision for driver dormitories is proposed to be developed. In the view of the same an area of 5000 square feet accommodating 30 personnel has been allocated for the purposes.

iv. Fuel Station

The fuel station will primarily house diesel and petrol dispensers. It would also contain a truck washing cum greasing bay as the demand may be.

v. Service Station:

Service station is a general-purpose mechanic shop offering following facilities:

- Vehicle service bays with a capacity to repair 8 vehicles at a time in tie up
- Two vehicle washing bays
- A fuel pump for captive use

- Greasing bays.
- Vehicle washing bays
- Accident job.
- Spare Parts sale.

vi. Office Complex

Office complex would comprise facilities such as RTO extension counters, restaurants, ATMs, office space for insurance companies, transport companies etc.

d. Other Support Facilities and Utilities

i. Road and pedestrian pathways.

Internal road system shall normally comprise of primary and local distribution roads. The roadwork shall be carried out strictly as per IRC specifications. The primary roads are the two lanes carriageways in two directions. Primary and local distribution roads have a road width of approximately 18 meters and carriage width of 4+4 meters.

Pedestrian walkways are provided for both type of the roads. All services for drains, sewers, water, power and telecom should be contained within the road reserves. Necessary signage, street name boards, zone guiding maps and visitors guidance map etc shall be positioned at necessary locations like intersections, entrance plaza and at various locations in each zone.

ii. Surface Drainage

All common roads and drains, all walkways & pathways shall be covered and the drains shall have rainwater-harvesting structures. The storm water discharge points shall be identified as per contour survey study and general drainage pattern of the site.

iii. Effluent, Sewerage collection and treatment System

The objectives of the sewerage system are to cater for the anticipated peak discharge requirements and to treat the waste to the discharge standards required.

iv. Solid waste management system

Solid waste management is one of the most essential services for maintaining the quality of life in the TMC and collection centres for ensuring better standards of health and sanitation. Effective measures shall be taken to effectively implement the solid waste management systems in the TMC. The measures to be taken may have to be decided after ascertaining the nature and quantity of solid waste generation after the TMC is occupied.

v. Other internal infrastructure shall comprise:

- Water supply.
- Administrative building.
- Canteen/ food outlet.
- Security & telecommunication.
- Entrance plaza.
- Sewage treatment plant.
- Solid waste management.
- Over head tank.
- Sub station.
- Telecommunication.
- Rainwater harvesting.
- Signage Walkways.

The details of the area allocation of the all the facilities indicated above is set out in **Annexure 3.**

9. Statutory and Legal Framework

Agriculture sector needs well functioning markets to drive growth, employment and economic prosperity in rural areas of the country. In order to provide dynamism and efficiency into marketing system, large private sector investments are required for the development of post harvest and cold chain infrastructure nearer to the farmers' field. Organized marketing of agricultural commodities has been promoted in the country through a network of regulated markets. Most of the state governments[5] and union territories shave enacted legislations (i.e., Agriculture Produce Market Committee Act) to provide for regulation of agricultural produce markets.

A major portion of investment for any infrastructure projects including agriculture infrastructure under private sector participation is expected from the private sector. This demands an appropriate regulatory and policy environment. Alongside, enabling policies need to be put in place to encourage procurement of agricultural commodities directly from farmers' field and to establish effective linkage between the farm production and the retail chain and food processing industries.

The Ministry of Agriculture (MoA) formulated a model law on agricultural marketing for guidance and adoption by state Governments. The model legislation provides for establishment of private markets/yards, consumer/farmers markets for direct sale and promotion of Public Private Partnership (PPP) in the management and development of agricultural markets in the country.

9.1 Regulatory Framework for Agri-markets under Karnataka Agriculture Produce Marketing (Regulation) Act, 1966

a. Establishment of Market Area under the Karnataka APMC Act

State government under the Act may by notification declare any area as market area for the purpose of marketing of agriculture produces mentioned under such notification. Such area notified by the state government shall not be less than a taluka and not more than a district (Section 3 & 4).

b. Establishment of Market Committee and its incorporation –

Market area under the Act is managed by the market committee established under the provisions of the Act. Market committee so established under the Act is a body corporate competent to contract and to acquire, hold, lease, sell or

[5] Few of the States having APMC Act in India includes Karnataka, Tamilnadu, Gujarat and Maharashtra.

otherwise transfer any property. Market committee shall take permission of the director of agricultural marketing before acquiring or transferring any immovable property (Section 9).

Contract or agreement on behalf of the market committee for the purchase, sale, lease, mortgage or other transfer of or acquisition of interest in immovable property as well with regard to execution of any work to be carried out at the expense of market committee shall be executed only after the same is sanctioned by the market committee. Chairman and the secretary of market committee have the power to enter into such contracts on behalf of the market committee (Section 55).

c. Acquisition of land for Market Area:

The state government under Land Acquisition Act, 1894 may acquire land for the purpose of the Act and shall transfer the same to market committee on payment of compensation to affected parties by the market committee (Section 69).

d. Powers and duties of market committee (Section 63)

Powers and duties of the Market Committee under the Act includes following.

i. Maintenance and management of yards;
ii. Regulate letting out the premises within the market yard;
iii. Provide necessary facilities for the transport and marketing of agricultural produce in the yards;
iv. Grant licenses to market functionaries;
v. Regulate opening, closing and suspending of trading in the yards;
vi. Facilitate settlement of all disputes between the seller and the buyer arising out of any kind of transaction connected with the agricultural produce;
vii. Collect, maintain and disseminate information in respect of production, sale, storage, processing, prices of notified agriculture produces;
viii. preventing adulteration of goods;
ix. Prosecute persons for violating the provisions of the Act, the rules and the bye-laws made there under;
x. Acquire, hold and dispose of any movable or immovable property for the purpose of efficiently carrying out its duties.

e. Levy of market fees:

Market committee shall levy and collect market fee from every buyer in respect of agricultural produce bought by buyer in the market area at such rates as may be specified in bye-law from time to time. The onus is on the stakeholders like commission agent, importer, producer, trader etc. to collect from the purchaser and to submit the same to market committee. Where any co-operative society is doing business in market yard, the market fee levied on such co-operative society shall be equal to 80% of market fee payable under this Act (Section 65).

f. Grant of License:

Every person desirous of operating as trader, surveyor, commission agent, warehouseman in market area shall apply for a license to the Market Committee. The Licensee shall have the right to use the market area for selling the notified agriculture produce (Section 72).

g. State Agricultural Marketing Board:

State government may by notification establish a board called Karnataka State Agricultural Marketing Board. The board shall be a body corporate having perpetual succession, common seal and subject to such restrictions as imposed under this Act (Section 100).

h. Functions of the Board

The Board shall, subject to the provisions of this Act, rules and regulations made there under, discharge the following functions and shall have power to do all such acts as may be necessary or expedient for carrying out its functions, namely:-

i. To advise on matters referred to it by the state government;
ii. To provide legal assistance to the market committee;
iii. To assist in the functioning of the market committee including in respect of programmes undertaken by the market committees for the development of markets;
iv. To undertake state level planning of the development of agricultural produce marketing;
v. To give advise to market committees in general or any market committee in particular with a view to ensuring improvement in the functions thereof;

vi. To co-ordinate functioning of all the market committees with the help of the information service obtained by both national and international markets;
vii. To assist the market committees in the preparation of site plans, estimates and development of market yards;
viii. To arrange or organize seminars, workshops or exhibitions on subjects relating to agricultural marketing;
ix. Such other functions as may be specified by regulations.
x. It shall be the duty of the board to advice on any matter referred to it by the state government.

i. Establishment of National Integrated Produce Market etc:

Act under Section 131A provides for establishment of National Integrated Produce Markets for marketing fruits and vegetables. National Integrated Produce Markets shall be an autonomous entity owned and managed by National Dairy Development Board incorporated under the National Dairy Development Board Act, 1987.

j. Conclusion

Karnataka Agriculture Produce Marketing (Regulation) Act, 1966 thus authorizes the market committee to establish an agri related infrastructure in the notified market area and for the purpose authorizes them to enter into a contract and acquire the land and levy market fees on every users of the facility in the market area.

9.2 Model Act on Agri-markets - New Thinking on Regulated Markets

The central government formulated and circulated a Model Act in the place of existing state APMC Act. Model Act provides improved regulation in marketing of agricultural produce, development of efficient marketing system, promotion of agri-processing and agricultural export and the establishment and proper administration of markets for agricultural produce in the state, and whereas, it is expedient to put in place an effective infrastructure for marketing of agricultural produce and lay down procedures and systems. It encourages:

a. Development of competitive agriculture marketing;
b. Deregulate the marketing system; and
c. Promote private sector investment in management and development of agricultural markets in India.

9.3 National Agricultural Policy

It was announced on 28th July 2000, to actualize the vast untapped growth of Indian Agriculture and to strengthen and support rural infrastructure for faster agricultural development. The Policy aims to attain:

a. Growth rate of 4% p.a. in the agricultural sector;
b. Growth that based on efficient use of resources;
c. Growth that is demand driven and to cater domestic markets;
d. Growth that is sustainable technologically, environmentally and economically.
e. Technically sound, economically viable, environmentally non-degrading development of agricultural resources through PPP.
f. Development of rain fed and irrigated horticulture, floriculture, roots and tubers to generate employment in rural areas.
g. Creation of favorable economic and environment friendly conditions for private sector participation.

9.4 Karnataka Agricultural Policy 2006

Karnataka Agricultural Policy recognizes the fact that, the agriculture sector in Karnataka has not received its due share of public resources and private investment in the last decade. Keeping this fact in background, the policy provides for ample provisions to encourage private sector participation in the agriculture sector.
Few of the policy guidelines in respect of private sector participation in creation of agriculture infrastructure are highlighted below;

a. Policy encourages introduction of suitable schemes in terms of tax incentives and land incentives to attract capital investments from private sector;
b. Policy envisages for amendment in Karnataka APMC Act in line with the Model APMC Act for the purpose of allowing private sector investment in creation of infrastructure in the agriculture marketing network;
c. Review Karnataka APMC Act with the object of providing incentives for setting up regional commodity exchanges, auction houses and terminal markets by way of public- private participation;
d. Encourages establishment of pre-cooling centers, cold storages and linking markets with refrigerated transport through private sector, co-operative sector and public sectors;
e. Encourages establishment of cold storage under suitable public private participation basis at each talukas;
f. Promotes establishment of agriculture export zone/food parks and allied activities through private and public sector;

g. Envisages for encouraging private sector to invest in food processing sector and to set up a separate fund to assist entrepreneurs in establishing agro processing units;
h. Encourages private investment for promotion and integration of supply chain in the agriculture sector.

Conclusion

The objective of this framework is to comprehend the prevailing legislations facilitating the private sector participation in agriculture sector and analyze the same in view of understanding its applications. Karnataka APMC Act which is the key legislation in so far the marketing of agriculture produces in Karnataka is concerned, hardly provides any scope for participation of private sector, since the same is undertaken under a separate pre-existing system. However, the Karnataka Agricultural Policy passed in recent years envisages a greater role for the private sector and encourages PPP by providing various incentives to attract investment from the private sectors and encourages establishment of agro processing units. The policy recommends for certain amendments in the existing Karnataka APMC Act to introduce provisions encouraging private sector participation in the agriculture marketing network.

10. Environmental and Social Impacts

The major objective and benefit of utilizing Environmental Impact Assessment (EIA) in project planning is to prevent avoidable losses of environmental resources & values through the development of a judicious and appropriate Environmental Management Plan (EMP). EMP includes protection / mitigation / enhancement measures as well as monitoring.

In the process of planning, it is essential for every project to formulate an EMP to ensure that resources are used with maximum efficiency and that each of the adverse impacts, identified and evaluated as significant be prevented or where required compensated. Possible mitigation measures generally include:

a. Changing project sites, routes, production technology, raw materials, disposal methods, engineering designs, safety requirements.
b. Introducing pollution controls measures, recycling and conservation of resources, waste treatment, monitoring, phased implementation, personnel training, special social services or community awareness and education.
c. Devising compensatory measures for restoration of damaged resources, monetary compensations for project affected persons, off-site programs to enhance some other aspects of the environment or quality of site for the community.

Monitoring is required to evaluate the success or failure (and consequent benefits and losses) of environmental management measures and subsequently to reorient the EMP. Regardless of the quality of an EIA and consequent environmental management measures, they are of limited value unless implemented. As experience has increased in using EIA process for environmental planning the need and justification for periodic monitoring in order to establish meaningful database has become obvious.

This EMP will have to include the following:

10.1 During Construction phase

Measures to mitigate the adverse impacts due to the following during construction phase.

a. Site preparation
b. Sanitation

c. Noise
d. Construction equipment & waste
e. Storage of hazardous material/dumping materials
f. Site security And Safety

10.2 During Operation Phase

a. Operation of various collection, and disposal facilities for emission, wastewater and solid waste.
b. Routine monitoring of selected parameters.
c. Laboratory facilities.
d. Data handling, reporting, Storage and retrieval facilities, feedback to facilitate future planning.
e. Emergency action procedures and disaster management procedures.
f. Manpower for environmental management.

10.3 EMP During Construction Phase

The mitigation measures to control adverse impacts during construction phase are discussed below.

a. Site Preparation

The development of site will involve the movement of top soil, removal of trees, shrubs, soils, rocks, debris etc. The site grading operation will also involve stock piling of backfill material. All the distorted slopes need to be stabilized suitably. During dry weather, control of the dust nuisance created by excavation, leveling and transportation activities will be carried out by water sprinkling. It should be ensured that both petrol and diesel powered construction vehicles are properly maintained to minimize smoke in the exhaust emission.

b. Sanitation

The construction work force shall be provided with sufficient sanitation facilities in order to maintain adequate hygienic conditions. Low cost sanitation system like septic tanks / soak pits will be provided. This will be done by provisions in contracts with the contractors.

c. Noise

There will be intense movement of trucks, passenger vehicles, earthmovers etc. in and around the project site. These will create noise and air pollution. Poor visibility, accidents, damages to health of local people etc. are foreseeable consequences. Workers working with heavy equipment generating high noise levels shall have to be provided with ear plugs/ muffs. The maintenance of construction equipment has to be done properly. This will be done by provision in the various contracts with the contractors. Vehicular movement towards the construction sites should be properly regulated to minimize the air and noise pollution consequences. Movement of cargo trucks should be minimum during night.

d. Construction Equipment and Waste

The project would involve lot of construction activities for infrastructural facilities and thereby structures are likely to come up on the proposed site and would thus involve the use of construction equipment/instruments. These at times would require on site maintenance and repairing. It will be ensured that both petrol and diesel powered construction vehicles are properly maintained by the contractors to minimize pollutant emission from exhaust. The vehicle maintenance area will be so located that contamination of surface water bodies by accidental spillage is avoided. Unauthorized dumping of waste oil will be prohibited.

e. Storage of Hazardous Material/Dumping Materials

Petrol, diesel, lubricating oil etc. will be required to be stored at site. These materials will be stored as per stipulated safety standards. Also a lot of material may be generated for disposal during construction activity. These, if disposed off haphazardly can pollute the nearby water bodies adversely. They would increase the accident incidences also. Utmost care will be taken to store these materials at a suitable place and then disposed off at a place in consultation with and as per the guidelines of Karnataka State Pollution Control Board and Central Pollution Control Board.

f. Site Security and Safety

i. A construction site forms a potentially hazardous environment. To ensure that the surrounding population is not exposed to these hazards, the site will

be properly secured by fencing or by construction of a boundary wall and also guards will be posted at entry points.

ii. First aid facilities should be created at different locations for immediate assistance in case of emergencies and accidents.

iii. Important information about nearby hospitals, fire stations, police station etc. should be kept available in the first aid centers for speedy action at the time of emergency.

iv. In case inflammable materials are to be kept at the site, they should be stored and handled in accordance with guidelines of inspectorate of safety and health of the state and central governments.

v. Fire hydrants and extinguishers should be located at all vulnerable sites.

10.4 EMP During Operational Phase

It may be pertinent to mention that adherence to recycling of emission and / or waste materials to the following dictum would go a long way to mitigate the pollution hazard due to any industry.

a. Formulation of in-plant waste minimisation programmes can save energy and raw materials. Recycling of emission and / or waste materials at source i.e. linked to the production process in the plant is considered important. Water which is a valuable resource used by various industries during their processes can be treated, recycled and reused for some secondary utilities thus effectively conserving the water.
b. Research and development programs on clean technologies have underlined that clean technology implementation is an effective mechanism to abate pollution, which works in addition to and independent of the regulatory process.
c. Furthermore this approach appears to open up possibilities for obtaining other benefits like savings in energy and raw materials.

The following measures are suggested to mitigate the different kind of pollution with regard to this project.

a. Air Pollution

The air pollution potential of the target list of industries for this food park looks moderate and would remain mostly limited to work place. There will be less likelihood of any emissions of hazardous or toxic nature into the environment during its operation. In plant control measures would be taken to contain fugitive emissions, so that the concentration of the pollutants in the workplace do not

cross the threshold limits. The following general measures would be taken to control the pollution in the proposed food park by individual industrial units.

i. The allowable emission rate would not be exceeded by individual plant.
ii. Air pollution control technology would be incorporated at the design stage itself.
iii. General housekeeping of each industry would be up to the mark.
iv. Suitable air pollution control equipment if required would be installed by the plant.

b. Water Pollution

When the development has completed and fully occupied, it is anticipated that the ETP shall be constructed to cater demand. The Wastewater generated in the food park would be treated by the individual industries to the required standards before discharging to common ETP. A portion of ETP outlet can be used for development of green belt and the balance can be reused for general cleaning activities.

c. Sanitation

All factory premises will have adequate and well-operated sanitation facilities in the project area.

d. Sludge Disposal

The sources of sludge include sludge from STP and Individual ETP's operated by the Occupant Industries (if required). This sludge can be disposed off by land filling operated by the approved agency of GoK, at a specially earmarked area for the same.

e. Disposal of Non Hazardous Solid Waste

The scrap materials generated would include packaging materials, scrap wood, cardboard, plastics, unused metal pieces, garbage in the form of papers, cloth fibers, polythene bags, electric components, wire, scrap metal, glass bottles, thermocol etc. Most of the above material is useful. A single external agency of GoK would be employed for whole of the food park area to collect these generated Non Hazardous solid waste, which can be recycled.

The domestic waste generated from Canteen shall be mainly biodegradable in nature. Established scientific disposal of domestic biodegradable waste is in practice and one such method is bio composting. This would involve setting up of a bioconversion plant by the local competent authorities of Karnataka State Government.

The type of industrial waste, biodegradable or non-biodegradable, depends upon the nature of processing and industry. In the food park the solid waste generated from the industries is expected to be both biodegradable and non-biodegradable in nature.

A comprehensive system needs to be evolved to scientifically dispose the biodegradable waste and inert waste in accordance with MSW 2000 Rules. This activity shall be handled by the local competent authorities of State Government.

f. Disposal of Hazardous Solid Waste

Units generating hazardous waste will not store, treat, dispose off, transport or offer for transportation without having received consent from central or state pollution control board under Hazardous Waste (Management & Handling) Amendment Rules 2000. The units will require complying with the rules and regulations of the Act. The hazardous industrial waste will be disposed off by individual industries as per the Hazardous Waste (Management and Handling) Amendment Rules, 2000.

g. Storm water Drainage for the Site

Storm water runoff contains an acknowledgeable pollution through dust, garbage and unprotected solid waste. The storm water discharge points need to be identified based on the terrain and levels of the site. The proposed food park will attempt to retain the drainage / disposal pattern, which is existing presently. It is designed to cater for the entire project area by gravity flow. Open rectangular drains are proposed to be provided. The storm water will be isolated to prevent contamination from process spills, floor washings etc. This is essential to prevent contamination of the water bodies into which the storm water would drain. The storm water drainage system would be completely dry during non-monsoon days.

h. Noise Pollution

The proposed noise control measures include a noise level restriction of 85 dB (A) at 1 m for equipment such as blowers, compressors, pumps and fans. The industries will be asked to maintain the indoor noise levels below the limit of 85 dB (A) prescribed for a distance of 1 meter from any machinery in the factory. This limit is referred as the `Alert Threshold' value below which there is a negligible risk of any damage to hearing capabilities as a result of 8 hours exposure per day. Industries would be required to implement proper and regular maintenance of machinery. Noise levels in the workplace can also be reduced by engineering control methods and industries would be required to follow measures as detailed below:

i. Keeping the total noise emission from all noise sources below the base limit in the work area.
ii. Regulating spacing between noise sources and between sources and operations. In free field conditions the sound level roughly varies with the square of the distance.
iii. Enclosing the noise sources by a sound reducing i.e. attenuating structure that prevents airborne transmission.
iv. Reducing structure borne transmission by isolation of the source using resilient mountings.
v. Damping of vibrating metal structures or by replacement with materials such as wood.
vi. All the operating personnel working in the zone of noise pollution should be provided with earmuffs or earplugs and it is recommended to provide training to the operators to use the same. Reducing reflected noise by use of absorbent materials on surfaces such as roof, walls and floors is recommended.
vii. Duty hours of employees working in high noise area shall be rotated systematically and proper maintenance to be given to earmuffs and silencers of noise generating equipment.
viii. Placing attenuating screens between the operations and the source
ix. Correcting imbalance and vibration by preventive maintenance.
x. Green belt should be developed around the identified noise generating zones to reduce ambient noise level below the standards prescribed.

i. Health Care Centre

Medical facilities, first aid centre and health centre near the site, which would be provided by project authorities, will help to protect the health of the project staff.

j. Green Space

An additional mitigation measure that has a broad definition in as much as it can be used to alleviate a number of adverse impacts due to air and noise emissions is the development of a green space around the facility. It has been proposed to develop green belt in the food park as per the master planning guidelines. These would not only absorb air and water pollutants but also help in arresting noise and soil erosion and creating favorable aesthetic condition. Pollutants in air settle on the ground and vegetation of surrounding area. Plants interact with the pollutants, absorb them and thus remove them from the atmosphere. The interactions of particulate and gaseous pollutants with diverse vegetative surfaces, under conditions of variable micro climatic and pollutant source characteristics are extremely complex. But still the utility of plants in curbing pollution cannot be denied. By their photosynthetic activity, the plants fix carbon dioxide from the atmosphere with concurrent release of oxygen and thus purify the air. Trees also absorb noise and serve as acoustic screen between busy highways, noisy industrial installations and human settlements. The importance of forests in modifying the hydrology of watersheds and in soil conservation has been well recognized. Plants intercept incoming and outgoing radiation, precipitation and wind and thus have a marked effect on the microclimate. They filter dust from the air and absorb it. The importance of plants in reducing the pollution hazard is therefore of considerable significance.

The selection of plant species for the green space is an important feature. It should be based on consideration of soil and agro climatic conditions, the types of pollutants emitted by the industry, mean wind velocity and dry deposition velocity of plants.

k. Socio-Economic Environment

The salient features are as under

i. It is imperative that a concrete and feasible plan be made to promote employment to the local people with equal opportunities to people.

ii. Training should be provided to the local people to acquire skill in various fields

iii. If possible and feasible, the educational facilities to be established at the site should be extended to the nearby villagers.

10.5 Environmental Monitoring

a. Routine monitoring

After the food park is in operation, routine monitoring of certain parameters will have to be done to ensure environmental quality control. It may be mentioned that the project proponents would make arrangements for the necessary monitoring programme.

b. Laboratory Facilities

A laboratory facility will be provided at a suitable site such as the effluent treatment plant site to cater to the routine analysis work required for operation of effluent / sewage treatment plant / solid waste facility of ALH.

c. Green Space Maintenance

The green space will be maintained under the expert advice of agriculturist / horticulturist/botanist.

11. Operating Framework

This section sets out the implementation framework for the project

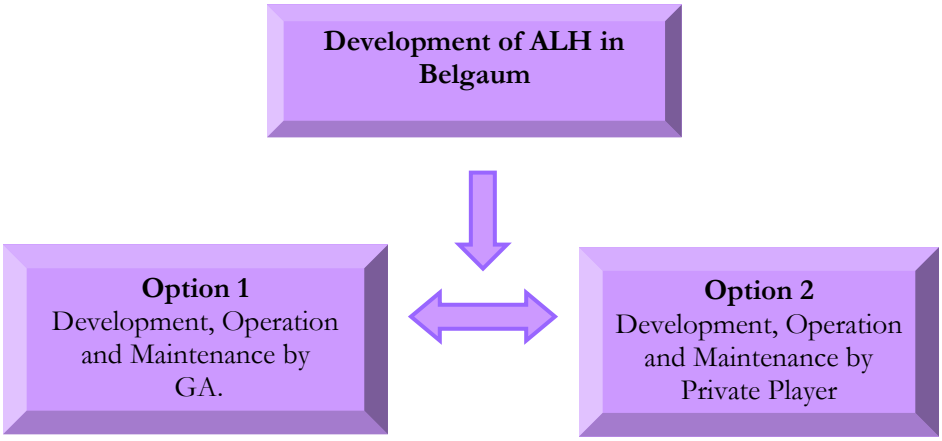
11.1 Project Development Activities

The project implementation activities involve four types of activities as set out below.

a. Construction and development of physical infrastructure.
b. Marketing of the project facilities.
c. Development of organization and systems.
d. Operation and maintenance of the project facilities.

11.2 Options for Project Implementation

The project facilities could be developed by Government Agencies (GA) concerned either by deployment of its own resources or under an appropriate PPP framework. The two primary development options comprise:



a. Option 1: Development, Operation and Maintenance by GA.

Under this option, following activities would need to be undertaken by GA.

i. Select a contractor to undertake development of the project facilities.
ii. Hire skilled manpower for carrying out the operations and maintenance of the developed facilities.

b. Option 2: Development, Operation and Maintenance by Private Player with GA playing the role of a facilitator.

In this option, development, operation and maintenance would be undertaken by a private operator(s). The private operator(s) would need to carry out their roles and responsibilities as per the contractual agreement signed with GA.

A comparative analysis of the risks associated in an event of implementation of the two options discussed above is set out in the table below:

Table 11: Risks associated with the implementation options.

Options	Parameters	Impact
Development, Operation and Maintenance by GA.	Manpower	Recruitment & management of operational staff by GA.
	Skill set	GA would need to appoint technical consultants for developing a strategy for development of ALH in Belgaum. GA would also be required to hire skilled manpower to operate and maintain the project facilities.
	Service Delivery	Since payments to operational staff are not performance based and often their motivation levels are low, this could affect the level of service delivery.
	Finances	GA would need to mobilize finances for procurement of tools / equipment and vehicles and for development of project facilities.
	Project Risks	The projects related risks such as design risk, cost over-run risk, time risks etc. and adherence to applicable laws would be retained by GA.
Development, Operation and Maintenance by Private Player.	Manpower	GA would need only supervisory staff as the private operator would be responsible for deployment of staff for providing services as envisaged.
	Skill set	The onus of providing skilled manpower would be with private operator.
	Service Delivery	As the payment to the operator would be made subsequent to demonstration by him of adherence to performance standards specified by GA, the service delivery levels would be high.
	Finances	The private operator would need to mobilize finances for procurement of tools / equipment and vehicles and for development of project facilities.
	Project Risks	The projects related risks such as design risk, cost over-run risk, time risks etc. and adherence to applicable laws would be retained by private operator.

Under Option 1, GA would not only retain all the Project related risks and be required to raise finances for undertaking the Project, but would also need to monitor and manage the operational staff. In contrast, if GA implements the Project under Option 2, it would need to appoint private sector operator and recruit only sector specialists for overseeing their activities. In view of the local situation, and from the point of view of effective implementation of the Project, Option 2 is more suitable for development of ALH in Belgaum.

11.3 Modes of Implementation

The following are the various modes of implementation under Option 2 that could be considered for the development of the ALH:

a. Lease Cum Sale Structure

GA to transfer the land to the private partner on the date of execution of agreement for the development of ALH. The private partner could develop the project facilities and lease out to interested food processing industries or related industries intending to operate the project facilities. Basic infrastructure and amenities like roads, drainage systems, street lighting, water supply, power/ electricity, communication networks – telephone connections, cable and internet connectivity as per requirements of agri-logistics industry would be provided by the private partner. In addition to providing infrastructure requirements, the private partner could also be responsible for maintenance and management of the common facilities for a stipulated period of time, say ten years.The private partner would be responsible for raising finances and carrying out the construction activities.

b. Joint Venture between GA and a private developer

A Special Purpose Vehicle (SPV) could be created by GA and the private developer under this option. The equity contribution of GA could be in the form of land for development of the ALH.

The SPV could develop the project facilities and lease out to interested food processing industries or related industries intending to operate the project facilities. Basic infrastructure and amenities like roads, drainage systems, street lighting, water supply, power/ electricity, communication networks – telephone connections, cable and internet connectivity as per requirements of agri-logistics industry would be provided by the SPV.

In addition to providing infrastructure requirements, SPV could also be responsible for maintenance and management of the common facilities for a stipulated time period, say ten years. SPV would be responsible for raising finances and carrying out the construction activities. The roles and responsibilities of the SPV are set out below

i. Mobilisation of finances and development of envisaged facilities as per the scope of project.
ii. Develop the facilities in accordance with design and construction requirements set out by GA.
iii. Maintenance of common facilities for a period of stipulated time period.
iv. Market the project.
v. Share the revenue with GA as per the agreement.

c. BOT Concession Structure

The private partner could develop the project facilities and lease out to interested food processing industries or related industries intending to operate the project facilities. Basic infrastructure and amenities like roads, drainage systems, street lighting, water supply, power/ electricity, communication networks – telephone connections, cable and internet connectivity as per requirements of agri-logistics industry would be provided by the private partner..

In addition to providing infrastructure requirements, the private partner could also be responsible for maintenance and management of the common facilities for a stipulated period of time. The private partner would be responsible for raising finances and carrying out the construction activities. The ownership of the land and the properties developed would remain with GA throughout the concession period.

The indicative roles of the stakeholders are set out below:

i. Private partner

- Mobilization of finances would be the responsibility of the private partner. The entire finance required for the project would have to be raised by the private developer within a pre-specified time frame.
- Develop the facilities in accordance with design and construction requirements set out by GA.
- Maintenance of project facilities for a stipulated period of time.
- Time-bound completion of the project.

- Over-runs in construction cost and operational expenses to be met by the private partner.
- Transfer the land and developed properties to GA on completion of concession period.

ii. Government Agency.

- Provide land to the developer for construction
- Set out the design and construction requirements

Comparative study amongst the three modes of implementation is set out in the table below.

Table 12: Comparative study amongst the modes of implementation.

Structure	Merits	Demerits
BOT Concession Structure	• Ownership of the property vests with GA at all times. • Private partner is allowed flexibility to develop the area in accordance with bye laws and in adherence to the minimum requirements set by GA. • No marketing responsibility to GA. • The land and the facilities developed on it would be transferred back to GA at the end of the concession period. • Assured and fixed revenue stream. • Uniform quality of services. • Risk of time bound completion and revenue risk is transferred to the private partner.	• Time for development may increase slightly. • All risk borne by private partner and may require higher returns. • Skills required for contract management.
Lease cum Sale Structure	• Ownership of the Land would be vested with GA for a stipulated period of time. • The development risk to be borne by the private partner. • No marketing responsibility to GA.	• Developer would have to pay a huge upfront payment to GA. • Mortgage rights would not be exercisable by the private partner., although the land acquisition cost would be borne by the

Structure	Merits	Demerits
		private partner. • Land acquisition cost to be borne by the private partner. • GA losses ownership of the land after the project development. • All risk to be borne by the private partner during the development of the project.
Joint Venture Structure	• Combination of sale and lease structure. • GA could realise a portion of the revenues upfront.	• GA loses ownership over part of the site area. • Allocation of space a major issue. • In case of pre-termination, handover could lead to prolonged disputes.

Considering the issues discussed above, the requirement of upfront finances, manpower and associated risks, it is proposed to develop the Project under a Build – Operate – Transfer (BOT) Concession framework.

11.4 Built Operate and Transfer (BOT) framework

The role of private player under BOT Concession framework for development of ALH in Belgaum is set out below.

a. Mobilization of finances would be the responsibility of the private partner. The entire finance required for the Project would have to be raised by the private partner within a pre-specified time frame. Therefore, GA would not be responsible for raising the funds for meeting the initial capital expenditure.
b. GA would lay down the technical specifications for the construction and subsequent operations and maintenance of the Project, which would have to be adhered to by the private partner. In the event that the private partner fails to meet the technical specifications laid down by GA, GA would have the option of substituting the private partner.
c. The risk of time-bound completion of the Project would be passed on to the private partner.
d. Since the revenue streams from the Project would commence only after completion of the Project, it would be in the interest of the private partner to

complete the Project as early as possible. GA may also stipulate a penalty to be paid by the private partner in case of delay in implementation of the Project.

e. The risk of over-runs in construction cost and operational expenses would be passed on to the private partner. Since the private partner is responsible for the implementation of the Project, any increase in cost of the Project would also be borne by him.

11.5 Role and obligations of the Private Partner for development of Agri-Logistics Hub.

The private partner would be responsible for development of project facilities which have been categorized into five broad activities namely

a. Development of project facilities – core facilities, specialized infrastructure, common utilities, roads and other utilities;
b. Procurement of equipments as envisaged for the operation of the project facilities;
c. Procurement of trucks required for the transportation of produce from collection centres to the TMC;
d. Operations and maintenance of the project facilities;
e. Make annuity payment to the GA on a quarterly basis;
f. Obtain necessary permits as required under Applicable Law for development and operation and maintenance of the project facilities.
g. Pay all taxes, duties and outgoings, including utility charges relating to the project facilities, as may be applicable.
h. Pay all taxes, duties and outgoings, including utility charges relating to the project facilities, as may be applicable.
i. Other obligations.

11.6 Role and obligations of the GA for development of Agri-Logistics Hub.

a. Provide land to the private developer free of all encumbrances;
b. Provide assistance in obtaining required information/data from the stakeholders;
c. Provide assistance to obtain all clearances.

11.7 Payment Terms and Mechanism

Payment terms and mechanism would primarily depend upon the viability of the project. In case the project is not viable on the stand alone basis, financial support would need to be provided to the private partner by GA in terms of one time capital grant or in terms of operational grant during the operational period. In case the

project is viable on stand alone basis, private partner would share operational profits with GA. Sharing of profits could be carried out in two ways as set out below.

a. Percentage wise sharing of profits

Private partner could share operational profits with GA at a mutually agreed percentage sharing mechanism. Percentage sharing could be ascertained based on the investments of the respective parties. Disadvantage of such mechanism is to develop transparency in the fund flow during the operational period. Revenue risk is mutually shared between the private partner and GA.

b. Fixed Annuity Payments

In this option private partner would need to make mutually agreed fixed payments to GA at regular intervals (say monthly or quarterly). Estimation of the fixed payments could be ascertained based on the projected cash flows envisaged for the project. Advantage of such mechanism is that GA could be assured of the fixed payments during the concession period and private partner would, well in advance, be aware of the fixed liabilities during the operational period. Revenue risk is passed on to the private partner.

12. Project Financials

The Agri Logistics Hub is an integral mix of specialized infrastructure with processing requirements of envisaged industry. Hence, it is imperative to understand the various specialized infrastructure facilities required to be housed in the hub meeting the needs of the captive market and this could be one of the single largest factor in deciding the viability of the project.

As a conscious strategy, it is proposed to establish the ALH at Belgaum which would propel the industrial growth in the state in general and in the region in particular. The development of the ALH has been spread over the period of 12 months.

12.1 Project Cost

The break-up of the project cost is set out in the table below and the quotations from the suppliers / manufacturers are set out in **Annexure 4**.

Table 13: Breakup of the project Cost **(Rs. in Lakhs)**

S.No.	Particulars	Total
1.	Land Development Cost	1.6
2	Roads, Footpath and Parking Lot	31.8
3	Landscaping	41.3
4.	Cost of civil works	1478.6
5.	Plant and Machinery	726.0
6.	Rolling Stock	670.6
7.	Contingency	114.0
8.	Interest During Construction and financing cost	110.8
	Total	**3174.8**

12.2 Project Cost components

In the detailed project cost mentioned above, the table below shows the various project components and their respective sub components.

Table 14: Components and sub components proposed for Agri Logistics Hub

Components	Sub- Components
Land Development Cost	• Land conversion and layout approval. • Land and bush clearance. • Contour survey and mapping. • Name & layout boards.
Roads, Footpaths and Parking Lot.	• Roads and drainage. • Site grading for roads.

Components	Sub- Components
	• Excavation and sand gravel mix. • WBM – 3 Layers, Semi dense Bituminous concrete, Primer Coat, and Tack coat. • Foot path and Kerbs. • Trapezoidal drains.
Landscaping	• Green belt. • Trees all along the site boundary. • Roadside trees. • Central Rotary Intersection & Entrance Plaza and pocket parks.
Civil Works	• Buildings – Administrative & social amenities. • Buildings including auction centre, loading and dispatch centre, commercial block, security block, sub station, generator room, weigh bridge room, cold storage, warehouse etc. • Rain water harvesting structures. • Sewerage & treated effluent network and solid waste management. • Effluent Treatment Plant (Treated Effluents). • Sewage pumping stations. • Water supply, treatment and distribution.
Plant and Machinery	• Power supply system. • Sorting and grading equipment. • Cold storage equipments. • Material handling equipments. • Digital display systems. • Refrigeration system – ripening chambers, cold storages etc. • Street lighting & fire fighting. • Street lighting all along the roads. • Fire hydrants and booster pumps. • Value added telecom services. • Electrical systems.
Rolling Stock	• Transport fleet of 77 trucks with 15 Reefer Vans (refrigerated trucks). • Registration costs. • Insurance costs.
Contingency	Contingency @ 5 % on the non-firm project costs.
Interest during construction and financial expenses	Interest during construction period is 15 % per annum.

The other financial assumptions are set out as **Annexure 5.**

12.3 Estimation of Revenues and Expenses

The details of revenues and expenses sources are as set out below

a. Rental Receipts

The operating income from rental receipts includes rentals for premises rented for warehouse facilities, cold storage facilities, commercial space, various office and services, etc. These will be the incomes which will be generated year after year. Corresponding to these incomes, the expenditures will cover items like general maintenance, power supply charges, maintenance of water supply and distribution (including effluent treatment plant charges), general maintenance of constructed premises, major repairs of road, water supply system, establishment expenditure for administering and maintaining the specialized infrastructure facilities provision for business promotion expenses, service facilities, etc.

b. Revenues from Grading and Sorting

Grading and sorting facilities are provided to the small and marginal farmers, large hold farmers, producers etc. to provide value additions to the agri produce and hence help market the produce better, resulting in higher revenue to the farmers. Nominal charges are envisaged to be collected from the users for utilization of such services.

c. Operation of Transport Fleet

Nominal charges could be collected from the small and marginal farmers/large hold farmers/producers for transporting the produce from the collection centres to the TMC.

The revenue and expenses estimates for the first 5 years of operations are as set out in the table below.

Table 15: Revenue and Expenses Estimates for the first 5 years of operations. (Rs. Lakh)

Sr.No	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
I	**Revenues**					
1	Warehouse rentals	101.6	112.1	123.6	136.2	150.2
2	Sorting and grading facilities	1,228.8	1,354.7	1,493.6	1,646.7	1,815.4
3	Weigh bridge	7.0	7.7	8.5	9.4	10.4
4	Operation of trucks	76.9	84.8	93.5	103.1	113.6

Sr.No	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
5	Commercial space rentals	49.2	54.2	59.8	65.9	72.7
6	Dormitories rentals	28.1	31.0	34.2	37.7	41.5
7	Cold Storage rentals	4.0	4.4	4.9	5.4	5.9
	Total Revenues	**1,495.7**	**1,649.0**	**1,818.0**	**2,004.3**	**2,209.8**
II	**Expenses**					
1	Administrative expenses	126.1	132.4	139.0	146.0	153.3
2	Water supply charges	50.0	55.1	60.8	67.0	73.9
3	Power supply charges	15.1	15.8	16.6	17.5	18.3
4	Transport fleet – Fuel charges	384.6	424.0	467.4	515.3	568.2
5	Repairs and maintenance – Transport fleet.	33.5	35.2	37.0	38.8	40.8
6	Other Maintenance Charges	158.7	166.7	175.0	183.8	192.9
	Total Expenses	**768.0**	**829.2**	**895.9**	**968.4**	**1,047.4**

12.4 Assessment of Financial Viability

Modern and reliable methods of capital budgeting like Net Present Value (NPV), Internal Rate of Return (IRR) or discounted cash flow have been used to assess the viability of the project. Weighted Average Cost of Capital (WACC) has been assumed to be the discounting rate for the purposes of calculation of NPV.

Viability of the ALH primarily depends upon the occupancy of the project facilities. A study of similar facilities across the country has shown that average occupancy of the ALH has been to an extent of 50% annually and hence the same has been considered as the base case for assessing the viability of ALH in Belgaum. The IRR and NPV calculations for the base case are estimated to be 17.1 & Rs. 726.1 lakh respectively.

12.5 Quarterly Payments

It is observed that in the base case, the project is viable and the private partner could share the profits with GA. It has been assumed that the private partner could pay GA in terms of fixed annuity payments to be paid quarterly during the concession period of 15 years. Scenarios have been developed to analyze the viability of the project under different circumstances and the details of the same are set out below.

a. Development of Scenarios

Scenarios have been developed with respect to the variations in the occupancy of the project facilities and the details of the same are as set out in the below.

i. Scenario 1: pessimistic approach – project facilities occupancy of 45% annually.
ii. Scenario 2: realistic approach – project facilities occupancy of 50% annually.
iii. Scenario 3: optimistic approach – project facilities occupancy of 55% annually.

b. Sensitivities

Sensitivities in terms of variations in the fixed annuity payments to be paid by private partner to GA at regular intervals and on quarterly basis, with variations in the operational expenses have been analyzed to achieve a Project IRR of 15%. The details of the same are as set out in the table below.

Table 16: Variation in Fixed Payments with variations in Expenses of the Project. (Rs. Lakh)

Operation Expenses	Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Increase by 5%	---	16.3	42.5
Remains unchanged	---	27.5	53.8
Decrease by 5%	7.5	38.8	66.3

13. Bid Process Management for Identification of the Private Operator

A transparent competitive bid process could be carried out for the identification of the private operator. The process would involve preparation of tender documents and carrying out a bid process for identification of the private developer.

13.1 Tender Documents

Selection of the private developer would be carried out in a transparent competitive bidding process. GA could adopt a single stage process for selection of the private developer.

The contractual documents that would need to be prepared for selection of the private operator would include:

a. Request for Proposal document (RFP)

   The RFP document shall comprise the eligibility criteria, qualification criteria and evaluation methodology for selection of Successful Bidder for the development of the Project.

b. Draft Concession Agreement (DCA)

   The DCA would comprise roles and responsibilities of the stakeholder, payment terms, events of defaults, termination conditions, termination payments, design and construction requirements, O&M requirements etc.

c. Project Information Memorandum (PIM)

   The PIM would include extracts from the Detailed Project Report (DPR) prepared by GA.

13.2 Process for Selection

The evaluation of the Proposals could be carried out in four stages as detailed below.

Stage 1: Scrutiny of "Key Submissions"
Stage 2: Evaluation of "Qualification Information"
Stage 3: Evaluation of "Technical Proposal" and
Stage 4: Evaluation of the "Financial Proposal".

Stage 1: Scrutiny of "Key Submissions"

The Bidders would be required to submit documents as listed in RFP document along with supporting documents validating their eligibility, technical experience and financial capability. The Proposals submitted by Bidders would be checked for key submissions and responsiveness to ascertain that the documents required as per the RFP have been submitted. The key submission would include the following.

a. Covering Letter for submission of proposal
b. Details of Bidder
c. Power of Attorney
d. Memorandum of Understanding in case of Consortium
e. Anti-Collusion Certificate
f. Bid Security

Stage 2: Evaluation of "Qualification Information"

The responsive Proposals would then be evaluated on the basis of the Qualification Information, Technical Proposal and Financial Proposal criteria.

a. Qualification Information

Only Business Entities shall be eligible for bidding for the Project and a Business Entity shall mean a company incorporated under the Companies Act, 1956 or under an equivalent law abroad.

Assessment of Technical Capability

The Bidder would need to satisfy the following criteria to qualify for the Project. The Bidder's technical capability could be proposed established based on the following parameters and the Bidders would be required to meet at least one of the following three parameters mentioned below:

i. Experience in development or operating and maintaining in agri SEZ's, Food Parks, industrial estates, agri processing industries and industrial parks on atleast 10 acres of land within the past 10 years; or
ii. Experience in construction of agri SEZ's, Food Parks, industrial estates, agri processing industries and industrial parks on atleast 10 acres of land within the past 10 years; or

iii. Development of core infrastructure sector projects under BOT Concession framework with project cost of at least Rs. 50 Crores during the past 10 years.

Assessment of Financial Capability

Financial Capability of the Bidders could be evaluated based on net worth and the Bidders shall have a networth of at least equal to Rs. 10 Crores, as at the end of the most recent financial year.

Stage 3: Evaluation of "Technical Proposal"

The Technical Proposals of the Bidders, who pass Stage 2 evaluation, as described above, would be evaluated and the parameters that could be considered for the same are set out in table below.

a. Methodology Statement
b. Project Construction Plan
c. Resource Utilization Statement
d. Financial Plan
e. Operations & Maintenance Scheme
f. Project Schedule

The Technical Proposals would be scored on the basis of the above parameters and the threshold score for evaluation of the Financial Proposals could be 70 marks.

Stage 4: Evaluation of "Financial Proposal"

The Financial Proposals of the Bidders would be the monthly annuity payment payable by the private developer to GA. The bidder quoting the highest monthly annuity payment would be the preferred bidder.

14. Way Forward

a. The proposed concept and strategy for development of ALH in Belgaum district headquarters would need to be approved.

b. Land for development of ALH in Belgaum district headquarters would need to be identified and land would need to be acquired for development of the ALH.

c. Necessary approvals would need to be taken for the Project from government agencies concerned.

d. Tender documents for identification of the private developer would need to be prepared.

e. Bid process management could be carried out for identification of the private developer.

Annexure 1

Details of the Industries in and around Belgaum District

Sl. No.	Name of the Company	Location of the Unit	Investment (Rs. crores)	Employ-ment (Nos.)
1.	Athani Farmers Sugar Factory Ltd.	Mahabhavi Village, Athani Taluk	46.5	750
2.	Athani Farmers Sugar Factory Ltd	Vishnunagar, Navalihal Athani	447.3	488
3.	Malaprabha Sahakari Sakkare Karkhane Niyamith	M.K. Hobli	31.5	520
4.	Bhagyalaxmi Sahakari Sakkare Karkhane	Khanapur Road, Udyambag	44.5	600
5.	Doodaganda Krishna Sahakari Sakkare Karkhane Niyamith	Chikkodi	51.7	762
6.	Gataprabha Sahakari Sakkare Karkhane Niyamith	Gokak	16.4	585
7.	Krishna Sahakari Sakkare Karkane Niyamith	Athani	43.0	235
8.	Riddi Siddi Gluco Brols Ltd	Falls Road, Gokak	110.0	264
9.	Shree Renuka Sugars Ltd	Munoli, Soundatti Taluk	63.1	396
10.	Shri Dhanalakshmi Sahakari Sakkare Karkane Niyath..	Khanpet Village, Ramadurga Taluk	50.0	625
11.	Shri Hiranyakeshi Sahakari Sakkare Karkhane Niyamith	Sankeshwar Taluk, Hukkeri	62.0	1873
12.	Shri. Devchand Sugar Limited	Shivapurwadi Village, Chikkodi Taluk	49.0	500
13.	Someshwara Sahakari Sakkare Karkhane Niyamit	Siddasamudra Village, Bailahongala Taluk, Belgaum.	50.0	625
14.	Sri Krishna Sahakari Sakkare Karkhane Niyamit	Sankonatti Village, Athani Taluk	48.9	177
15.	The Ugar Sugar Works Ltd	Ugarkhurd	161.0	1876

Sl. No.	Name of the Company	Location of the Unit	Investment (Rs. crores)	Employ-ment (Nos.)
16.	Vishwanath Sugars Ltd.	Bellada Bagewadi, Hukkeri Taluk	48.5	325
17.	Vishwanath Distillery Ltd	B.Bagewadi, Hukkeri Taluk	22.5	50
18.	Vishwanath Cogeneration Limited	Bellada Bagewadi Village, Hukkeri Taluk	31.3	50

Annexure 2

Details of Arrivals of the Agri-Produce at the identified Collection Centres

Metric Tonnes Per Annum

Crop Type	Atni	Belgaum	Bailahongal	Nippani	Gokak	Hukkeri	Khanapur	Saundatti	Ramdurg	Total intake
Banana	132.4	-	-	7.5	-	18.3	-	-	-	158.2
Mango	3,368.0	-	-	-	-	-	-	-	-	3,368.0
Sapota	-	-	-	-	-	-	-	-	-	-
Grapes	-	-	-	70.0	-	-	-	-	-	70.0
Papaya	-	-	-	300.0	-	-	-	-	-	300.0
Onion	11.5	65,307.5	356.6	325.0	70.6	-	-	-	-	66,071.2
Tomato	50.0	-	-	500.0	-	-	-	-	-	550.0
Green Chillies	91.0	-	45.6	3,350.0	-	-	-	-	-	3,486.6
Potato	8.9	62,160.7	-	968.5	-	-	-	-	-	63,138.1
Brinjal	-	-	-	-	-	-	-	-	-	-
Turmeric	-	-	-	-	-	-	-	-	-	-
Garlic	-	147.7	55.7	-	-	-		-	-	203.4
Cashew	-	-	-	-	-	-	-	-	-	-
Coconut	86,108.3	-	-	21,749.0	-	15,681.0	-	-	-	123,538.3
Maize	2,547.3	-	2,641.7	93.5	41,263.4	3,149.7	269.5	46,164.2	5,549.2	101,678.5
Rice	109.5	7,446.5	218.3	25.0	-	9.2	-	4.4	-	7,812.9
Jowar	246.0	1,802.6	736.8	86.0	386.8	53.6	163.1	-	600.5	4,075.4
Jaggery	375.2	7,141.5	30.8	215.7	5,923.4	643.4	238.5	-	6,253.5	20,822.0
Cotton	1,830.3	867.3	11,858.5	-	4,036.2	13.2	29.9	3,472.6	458.7	22,566.7
Total	**94,878.4**	**144,873.8**	**15,944.0**	**27,690.2**	**51,680.4**	**19,568.4**	**701.0**	**49,641.2**	**12,861.9**	

Annexure 3

Area Allocation of the Facilities Proposed for the ALH in Belgaum

Sr.No	Particulars	Unit	Area
A	Common facilities (Specialized Infra, Utilities and Special Amenities)		
1.	Auction Centre	Sq.ft	15,000.0
2.	Loading, Unloading and dispatch centre	Sq.ft	46,268.0
3.	Quality Testing Laboratory	Sq.ft	1,000.0
4.	Admin Block	Sq.ft	1,500.0
5.	Commercial Block	Sq.ft	15,494.4
6.	Security Block	Sq.ft	450.0
7.	Sub-Station	Sq.ft	1,000.0
8.	Generator Room	Sq.ft	1,000.0
9.	Weigh Bridge Room	Sq.ft	150.0
10.	Cold Storage	Sq.ft	4,441.9
11.	Warehouse	Sq.ft	169,416.2
12.	ET and Water Treatment	Sq.ft	1,500.0
13.	Grading and Packaging Hall	Sq.ft	4,755.9
14.	Other amenities (canteen, Hotel, bank etc.)	Sq.ft	16,852.5
15.	Rejected Produce Shed	Sq.ft	1,000.0
16.	Truck parking Area	Sq.ft	15,000.0
17.	Driver Dormitories	Sq.ft	5,080.0
18.	Dispensary	Sq.ft	1,000.0
19.	Fuel Station	Sq.ft	3,000.0
20.	Service Station	Sq.ft	1,000.0
21.	Admin Office - logistics Centre	Sq.ft	1,500.0
	Total (A)	Sq.ft	**306,408.9**
B	Roads, foothath and Parking area	Sq.ft	65,659.0
C	Open Space	Sq.ft	65,659.0
	Total (A+B+C)	Sq.ft	**437727.0**

Annexure 4

Quotations

REF.: BLR/SS/2009-10
02.05.2009

M/s INFRASTRUCTURE DEVELOPMENT CORPORATION (KARNATKA) LIMITED,
INFRA HOUSE, # 39, 5TH CROSS,
8TH MAIN, RMV EXTENSION,
SADASHIVNAGAR,
BANGALORE – 560080 **Kind Attn. : Mr. Sujay Shetty / Nikhil Raj**
Ph.: 080-23613014/15
Fax : 23613016

Dear Sir,

Sub.: Quotation for the supply of Nilkamal's Plastic Crates

Greetings and acknowledge with thanks the receipt of your enquiry and information on handling of products at your logistic hub.

With reference to the above subject matter & as per the discussion had with the undersigned, we introduce ourselves as an ISO 9002 Company and the Pioneers and Leading Manufacturers of Plastic Heady-duty Stackable Crates for the past 25 years for handling Agri-Products like Vegetables, Fruits, Flowers and Plants etc.

Plants such as : Mangoes, Cashew nuts, Ber, Pomegranates, Oranges, Bananas, Sapotas, Papayas, Grapes, Onion, Tomatoes, Green Chillies, Potatoes etc.

Food materials: Spices, ketchup, jams, flour etc.

Our crates are made form HDPE food grade and hence hygienic. They are light but strong, durable and convenient to handle. They are also stackable one on the other up to seven layers thus saving space in storage. They are used also in cold storages, Green Houses, Nurseries and Tissue Culture, Food Processing Units, pre cooling units, grading units and canning & in processing of fruits and vegetables.

Our following Crates are very popular:

1. Model: CH 6545315 (Jumbo) with holes for Roses
2. Model: JR 85425 (Giant) for karelas and other Vegetables
3. Model: CH 64285 for Papayas
4. Model: JR 53300 Multipurpose for Chickoos, Mangoes, Tomatoes & Grapes
5. Model: JR 5436275 , JR 53250 for Grapes
6. a) Model: CC 43065 b) Model: CC 53150 with 7 Nos. for Strawberries
7. a) Model:JBC 53305 Medium b) Model:JBC 5436275 for Pomogranate "Dalimb"

However, as per the preliminary discussion and keeping your application in mind, we recommend the below mentioned model and the budgetary price for the same.

Contd..2..

Sl.No.	Model	Price
01.	**MODEL: JR 53300HWEEB** **Extra Elevated Bottom and Heavy Duty** **Size:** O.D. 542(L) X 360(B) X290 (H) MM Approx. I.D. 510(L) X 327(B) X 285(H) MM Approx. **Weight :** 1.7 Kgs. ± 2% Approx.	Rs. **210**.00 Each
02.	**MODEL : JR53300DW** **Double Wall & Heavy Duty** **Size:** O.D. 542(L) X 360(B) X290 (H) MM Approx. I.D. 510(L) X 327(B) X 285(H) MM Approx.	Rs.. **220**.00 Each
03.	**MODEL : JR6238300SN** **STACKABLE & NESTABLE** **Size:** O.D.626(L) X 381(B) X300 (H) MM Approx. I.D. 590(L) X 345(B) X 293(H) MM Approx	Rs.. **280**.00 Each

The above model can hold fruits & vegetable between 20-30 kgs. ideal for handling, transportation and avoid damages for the product. Requesting you to please arrange for a presentation so as to show our whole range of products.

Terms & Conditions:

Price : Ex our works
Excise Duty : E.D. 8.24% Extra OR as applicable at the time of delivery
Tax : 2% Tax against Form 'C' **OR Full Tax 4% C.S.T. EXTRA**
Freight : at actuals from our factory
Payment : 100% payment along with Purchase Order
Delivery : Within 15 - 20 days on receipt of your order
Colour : Blue / Red / Green
Validity : Quotation is valid for 10 days.

We are sure you will find our above offer most competitive and look forward to receive your valued order at the earliest.

Thanking you,

Yours faithfully,
for **NILKAMAL LIMITED**,
Paramount

Regional Office:
No. 201, II Floor, Soundarya

5th Cross, Malleshwaram,
BANGALORE – 560 003
SANTOSH SHENOY Ph.: 23314879 Telefax: 23316046
Asst. Manager E-mail:bangalore.ro@Nilkamal.com

To,
Mr. Nikhil/Sujay
Infrastructure Development Corporation Karnataka Limited.
Date: 29 /04/ 2009

Subject :Quotation for Electronic Weighing Scale

Kind Attn. : Mr. Nikhil

Dear Sir,

With reference to your enquiry, we introduce ourselves as SUNSHINEE ENTERPRISE. – a professionally managed Ahmedabad Based Reputed **ISO 9001 : 2000** Certified Company engaged in the field of Manufacturing & Trading Industrial Electronic Weighing Scales & Systems since 1991 under 'IOTA' brand name from 200gms to 100 tonnes. We are glad enough to have the best of Network in India.

We are pleased to quote our most competitive prices as below:

SR. No.	Model	Capacity	Accuracy	Pan Size	Basic Price(Rs.)
1	PS-200	200 Kg	20 gm	600 x 600	8500 .00+ Tax

Terms & Conditions :-
VAT : Extra @5% or CST @2% against form C
Warranty : 1 Year From The Date Of Billing
Delivery : Ex-stock
Payment : Payment Against Delivery by DD or Cheque:" Sunshine Enterprise" Payable at Ahemedabad
Transportation :Extra as per actual to be paid by customer

We hope you will find the offer most suitable. Please feel free to contact us for any further information call. YOU CAN VISIT UR WEB SITE www.eweighscale.com for product detail and specification with picture

Thanking you.

Yours faithfully,
FOR
SUNSHINE ENTERPRISE

Ritesh Sirohia (09825015700)

Price Schedule for Pack House

Description	Qty	Amount in Rs.
Towards Price for Supply of panels for Cold storage of 500MT and sliding doors as per Annexure I – Basis of Design.	1 Lot	Rs. 55,25,000/-
Towards price for supply of Refrigeration systems for Cold storage as per the design.	1, Lot	Rs 12,45,000 / -
Humidifier to maintain desired conditions inside the cold storage.	1 No	Rs 2,15,500 /-
Packing, forwarding, transit-insurance and freight up to Bangalore site.	Lot	Included
Price (Rupees Sixty Nine lakhs Eighty Five Thousand Five Hundred Only)	Lot	**Rs. 69,85,500/-**
VAT @ 12.5 %		**Extra**
Order for Supply to be placed on "BLUE STAR LIMITED, Bangalore"		

Description	Qty	Amount in Rs.
Installation & Commissioning charges **Price** (Six lakh Sixty Five thousand Only)	**1 Lot**	**Rs. 6,65,000/-**
Service Tax @ 10.30%		**Extra**
Order for Installation & Commissioning to be placed on authorized dealer **"Blue Star limited, Bangalore"**		

Note: Any Statuary Tax Variation on account of VAT implication is to Customer Account.

Also please note that All Civil / Frame Works are under Customer Scope.

Blue Star Limited

Authorized signatory **

Annexure 5

Assumptions for the Project

1. Revenues

a. Rental Receipts

i. Warehouse facilities

- Space available is to an extent of 1.7 lakh square feet.
- Lease rentals assumed to be Rs. 10 per square feet per month.
- Capacity utilization: 50% in the first year of operation.
- Escalation in the lease rentals: 5% year on year during the concession period.

ii. Cold storage facilities

- Space available is to an extent of 4500 square feet.
- Lease rentals assumed to be Rs. 15 per square feet per month.
- Capacity utilization: 50% in the first year of operation.
- Escalation in the lease rentals: 5% year on year during the concession period.

iii. Commercial space

- Space available is to an extent of 50,000 square feet.
- Lease rentals assumed to be Rs. 15 per square feet per month.
- Capacity utilization: 50% in the first year of operation.
- Escalation in the lease rentals: 5% year on year during the concession period.

b. Grading and Sorting Facilities

i. Capacity of the sorting and grading lines: 700 tonnes per day.
ii. Rentals: Rs. 1000 per metric tonne.
iii. Capacity utilization: 50% in the first year of operation.
iv. Escalation of 5% year on year during the concession period.

c. Weigh Bridge

i. Number of trucks utilizing the facility: 77 trucks per day.
ii. Rentals per truck: Rs. 50 per truck.
iii. Capacity utilization: 50% in the first year of operation.
iv. Escalation of 5% year on year during the concession period.

d. Operation of trucks

i. Number of trucks to be operated: 77.
ii. Total distance travelled per annum by the trucks from the collection centres to the ALH: approximately 21000 kilometers.
iii. Revenues from operation of truck: Rs. 2 per kilometer of distance travelled.
iv. Capacity utilization: 50% in the first year of operation.
v. Escalation of 5% year on yea during the concession period.

2. Operating Expenses

a. Administrative expenses – Salary expenses

i. Manager (3 nos.) : Rs. 20,000 per month
ii. Assistant Manager (2 nos.): Rs. 15,000 per month.
iii. Driver and assistants (150 nos.): Rs. 7000 per month.
iv. Others (10 nos.): average salary of Rs. 10,000 per month.
a. Escalation of 5% year on year during the concession period.

b. Water Supply Charges

i. Quantity of water required to be supplied to the facilities: approximately 2000 lakh litres per annum.
ii. Water charges: Rs. 5000 per lakh litre.
iii. Capacity utilization: 50% in the first year of operation.
iv. Escalation of 5% year on year during the concession period.

c. Power supply charges

i. Connected load

- Electrical load: 120 KVA.
- Air Conditioner load: 50 KVA.

ii. Hours of operation

- Electrical load: 16 hours per day.
- Air Conditioner load: 16 hours per day.

iii. Power source

- Utilization of State Electricity Board (SEB): 80%
- Utilization of DG Set: 20%

iv. Power cost

- Fuel cost: Rs. 6.5 per unit.
- SEB power cost: Rs. 4.8 per unit.
- Capacity utilization: 50% in the first year of operation.
- Escalation of 5% year on yea during the concession period.

v. Rolling stock expenses

- Total distance travelled by the transport fleet: approximately 21,000 kilometers.
- Fuel mileage: 3.5 kilometers per litre of fuel.
- Cost of fuel: Rs. 35 per litre.
- Capacity utilization: 50% per annum.
- Escalation of 5% year on yea during the concession period.

vi. Repairs and Maintenance cost: Rolling Stock

- Approximately 5% of the cost of the rolling stock.
- Escalation of 5% year on yea during the concession period.

vii. Other maintenance cost

- 5% of the project cost.
- Escalation of 5% year on yea during the concession period.