

# STATE AGRICULTURAL INFRASTRUCTURE DEVELOPMENT PLAN (SAIDP) FOR KARNATAKA 2015-16 TO 2019-20

## *Chapter I*

### INTRODUCTION

The Rashtreeya Krishi Vikasa Yojana (RKVY) guidelines were revised for providing funds to different States for 12th Five Year Plan period. Accordingly, the funding pattern was also modified to suit to the emerging needs of different States. In fact, the Government of India had organised several meetings at New Delhi under the aegis of Planning Department involving Ministry of Agriculture & Co-operation and all stake holders from different States. After detailed deliberations, the revised RKVY guidelines were communicated to States for implementation. The total funds provided to States will be allocated to different implementing Departments and Institutions under the following groups:

i.	Production Growth	: 35%
ii.	Infrastructure and Assets	: 35%
iii.	Special projects	: 20%
iv.	Flexi fund	: 10%
	<b>Total</b>	<b>100%</b>

Keeping this background, each Department/Institution has to submit Detailed Projects Reports (DPRs), according to the sub group for seeking funds.

The Government of India has specifically made it a mandate to submit Comprehensive District Agriculture Plans(C-DAPs), Comprehensive State Agriculture Plan and State Agricultural Infrastructure Development Plan before

releasing funds to the States. During XII plan, emphasis is bestowed on Infrastructure development under RKVY. Infrastructure in agriculture sector helps in many ways so that the farmer can increase in his income.

- Farm machinery helps in carrying out timely field operations.
- Proper storage, safeguards the farm produce and helps for securing good prices and also acts as an insurance against distress sale of produce
- Cold storage and supply chain management protects the perishable produce from spoilage, besides, helps in getting higher income to farmers
- Value addition, packing, branding and good marketing network also adds to the income of the farmer.
- Good infrastructure helps in improvement of shelf life of the produce besides, retaining the quality parameters

The State Agriculture Infrastructure Development Plan (SAIDP) is prepared by integrating the components included in C-DAPs and also common infrastructure required at State level/two or more districts at a time. The SAIDP, considers the development objective of achieving 4.5% growth in agriculture and allied sectors with focus on various infrastructure needed to achieve this level of growth. The plan will also include sector wise, year wise and district wise infrastructure needed to achieve the growth projections.

The objective of focusing specifically on infrastructure in SAIDP is to emphasise the need of infrastructure in development process and plan to allocate funds needed to create new infrastructure and/or strengthening

existing infrastructure. The proposed infrastructure, in each Sector/District was drawn from indicative and broader list of infrastructure for each sector provided by Govt. of India as per RKVY guidelines (Annexure I). It is expected that SAIDP will serve as a document to support C-SAP for the development of agriculture and allied sectors.

## **REVIEW OF SECTORS**

### **2.1. AGRICULTURE:**

Agriculture is the core sector of Karnataka, as 68 % of population depend on it for their livelihood and governs 15 % GDP. Agriculture is the profession of 90 % of rural population and 85 % rural households. Entire food requirement of the State depends on agricultural sector, including indirect availability of processed agricultural goods in the market. Agriculture in Karnataka has supported industries like roller flour mills, rice mills oil extraction industries, ginning/spinning mills, ready to eat food industries, bakeries, confectionary industry, sugar mills, distilling units and cattle feed manufacturing units. To surmise, agriculture is the backbone of Karnataka's economy. However, Karnataka's need of wheat, barley and some oilseeds are not fully met by State's present production. But, State has surplus production of sugar, tobacco, cotton than its needs and they are traded outside Karnataka.

The main agricultural crops of Karnataka include, paddy, ragi, jowar, maize, greengram, blackgram, redgram, bengalgram, soyabean, horsegram, cowpea, sunflower, groundnut, safflower, sesamum, niger, castor, sugarcane, cotton and tobacco. In recent years, sizable area under crops like jowar, wheat and minor millets have been replaced by maize and similarly, area under blackgram, horsegram are replaced by ragi/maize. Safflower and niger area is replaced by sunflower. Area under paddy and other commercial crops is replaced by sugarcane under irrigation.

Every district of Karnataka is solely dependent on agriculture not only for its food needs but to meet the demand for agro-industries and different types of trading activities related to agricultural products. Hence, improvement in

agriculture not only improves the farmer's income by accelerating the growth of entire district.

Agriculture in Karnataka is dependent on rainfall at least in 66 % of its cultivated area. Hence, variations in rainfall decide the success of agriculture in the entire State. The remaining 34 % irrigated area is also indirectly dependent on rainfall. In this background, efficient utilization of rain-water, besides, irrigation water, is decisive in the success of agriculture in the State.

Similarly, other key factors deciding the success of agriculture is the availability of adequate seeds of good quality at the right time at farmer's places. Many other factors like making fertilizers/PP chemicals available to farmers will also play major role in the success. In the backdrop of acute shortage of labour in rural areas, mechanization plays key role in the success of agriculture. And finally, availability of market prices offered to agricultural produce will decide the success, as farmers' motivation is decided by the share of their profit. The cost of cultivation has increased over years, but the market rates of agricultural produce have not increased at the similar rate, resulting in shrunk profit margins of the farmer.

## **2.2. HORTICULTURE:**

It is the most important Sun-rise sector of Karnataka engaging nearly 23 lakh households of Karnataka and occupying about 20.2 lakh ha. of cultivated land with a production of about 171 lakh tons. Horticultural production keeps the farmers engaged throughout the year by extended employment generation and is the source of income throughout the year as the production is spread over 8 – 10 months of the year. The horticultural crops, by virtue of their composition, are the sources of minerals, vitamins, fibre, anti-oxidants and

fructose/sucrose, which are essential for health and to provide nutrition security of entire population. Horticultural crops are also of greater importance with respect to exports, as many fruits and flowers have higher export value as compared to agricultural crops. Horticultural crops alone contribute about Rs. 35000.00 crores towards State GDP and nearly Rs. 7500.00 crores towards annual exports from Karnataka.

Owing to varying soil and climatic features in Karnataka, large number of fruits, vegetables, flowers, plantation and spice crops can be grown on commercial scale. This has elevated Karnataka into prime position with respect to horticulture in the entire country. Important fruit crops include mango, banana, grapes, pomegranate, sapota, pineapple, guava, water melon, lime, lemon, while vegetable crops grown in Karnataka include French bean, brinjal, onion, garlic, okra, snake-gourd, bitter-gourd, tomato, chilli, capsicum, carrot and potato. Important flower crops grown in Karnataka are rose, gerbera, gladiola, dahlia, marigold, chrysanthemum and jasmine. Important spices and condiments include pepper, cardomum, cashew, clove, cinamon, dry chillies etc., while plantation crops include coffee, coconut, arecanut, tea, cocoa, betelvine etc.

Horticultural crops are grown in almost all districts, although each district of Karnataka has concentration of specific horticultural crops. Bengaluru, Vijayapura districts are known for grapes, Chitradurga, Belagavi, Koppala and Bagalakote are known for pomegranate, Kodagu, Chickamagaluru districts area known for coffee. Some crops like mango, tomato are widespread throughout the State, while floriculture is concentrated in peri-urban districts of Bengaluru. The vegetables are grown in most districts except coastal and hilly districts (only to a limited extent) .

The growth of horticultural production in Karnataka is governed by specific driving forces like availability of chain of cold storage, processing centres and market infrastructure as well as export demand for specific crops like grapes, mango, pomegranate. Fruits and spice crops are in great export demand, while vegetables are consumed domestically.

### **2.3. ANIMAL HUSBANDRY:**

Principal activities of animal husbandry sector in Karnataka include dairying and poultry, whereas piggery is on minor scale. The State has 13 million dairy cattle (including buffaloes) and 53.4 million birds (broilers and layers). Dairying is principally carried as subsidiary activity of most agricultural farms by using household labour, whereas it is practiced as separate commercial enterprise as very limited number of independent business ventures. As against this, poultry is principally practiced as independent commercial enterprise in most cases, while it is rarely practiced as integrated enterprise in a farm. However, back yard poultry is still practiced in many rural households.

Induction of cross-bred in dairy cattle population in the last 30-40 years has prominently increased the milk yield. Nevertheless, the indigenous cows are in large number in northern districts of Karnataka although their milk yield is lesser. In general, population of cross-bred cows is higher in southern districts than northern districts. Similarly, buffalo population is higher in northern districts than southern districts. The average milk yield of indigenous cows in Karnataka varies between 1.5 to 4 lts./day/animal during their milking period of 3-4 months after parturition, while cross-bred cows yield around 8-15 lts./day/animal during their milking period extending to 6-7 months after parturition.

In most situations, the farmers do not feed their indigenous cows with concentrates in dry period and feed insufficient concentrates even in milking period. Similarly, they are also deprived of green fodder in most situations. Most indigenous cows are not regular in conception and therefore, milking cycles are not regular. Farmers' negligence about timely insemination during their heat period has also contributed to this situation. Due to all these reasons milk yield/animal is generally lesser in desi-cows. However, in cross-bred cows, the milk yield varies with factors such as good management/investment. In some districts like Kolar, Ramanagara, Hassan, Mysuru the cross-bred cows are reared with good management and higher investment (in feed). Their milk yields are higher. In other districts, providing concentrates is relatively lesser and milk yield is proportionally reduced. The rate of conception is higher in most cross-bred cows.

Buffaloes thriving in hot dry climate, are popular dairy animals in northern districts. In most situations, stall feeding of buffaloes is not prevalent as they depend on grazing. However, they are stall fed with concentrates during milking period.

In general, most milch cattle depend on grazing in the farm or grazing in forest lands/gomalas during the day time. Stall feeding them is generally restricted to night. In situations, where dairying is practiced as independent enterprise, stall feeding throughout the day is invariably carried out. In most situations, the cattle are deprived of green fodder and farmer's adoption of silage for making green fodder available throughout the year is extremely rare. Similarly, milch cattle in Karnataka are invariably reared in thatched roofs or make shift arrangements in farms and rarely farmers use exclusive construction

for rearing animals. Presently in Karnataka produces 61.23 lakh.tons of milk from 12.99 million milch animals.

The poultry is not still regarded as an integrated farm component, although some instances of successful inclusion of poultry birds in farming systems are reported. Major poultry production in Karnataka is from independent commercial enterprises in and around urban settlements, obviously due to demand in urban areas. These independent enterprises are not managed by farmers in most situations and even if managed by them, they are not integrated with other farm activities. Poultry is managed with varying size of 500 birds to 5000 birds in non-agricultural farms, while on agricultural farms it varies from 10-100 birds.

Both broiler and layer poultry farms are invariably managed with purchased feed, and instances of feed preparation by farmers themselves are rare. This invariably adds to higher costs of production. Typically well managed broiler farms take around 4-5 crops in a year, whereas some farmers struggle to harvest even 2-3 crops in a year. Typically, broiler yields are around 1-1.5 kg/bird. The layers are invariably reared under deep litter systems starting with typical period of 8-10 weeks. Farmers rearing the layers till 7-8 weeks are rare, although desirable. Typical average layer yields vary from 100-190 eggs/bird/year, although some well managed farm can have upto 250 eggs/bird/year.

The climate of Karnataka permits the birds to be reared without any extra care to provide heat in most districts, except Kodagu and hilly region of Uttara Kannada and Dakshina Kannada districts. However, extra lights are necessary in months from November to January to keep the birds warm & healthy.

The market driven enterprises of poultry is prominent around cities. Broilers are mostly lifted from the farms at designated hour every day and the eggs are invariably collected by farmers and packed and delivered to wholesaler in cities. The prices offered to broilers are generally consistent and remunerative, while, prices of eggs vary daily making layer growing more vulnerable. In recent years, corporates like Venkobb chicken have engaged farmers on contract basis for a fixed assured purchases in broiler market. This has encouraged broiler production greatly in Karnataka.

Twin issues governing expansion of poultry production in Karnataka are market prices and feed prices. The cost of production depends mainly on feed prices and most farmers have thin margin between cost of production and returns due to higher feed cost. Poultry products are in adequate demand and farmers can produce plenty of poultry products, if these two issues are able to be monitored.

Introduction of Giriraja and Girirani has added to poultry farmer's income as they are high yielding and adaptable to Karnataka's climate with low investment and management. However, local hens are also in great demand, especially as broiler due to specific taste experienced by consumers.

Presently Karnataka produces 4.41 million eggs and 1.81 lakh tons of broiler meat.

Sheep/goat rearing is an integral part of dryland farming in almost all districts except Kodagu, Dakshina Kannada and Uttara Kannada. Traditionally, shepherds have managed them as an exclusive profession. Even now majority of sheep/goat population is managed by them, as semi-nomadic enterprise wherein

the animals return to their pen during night after grazing in distant places during day time. Professional agriculturists own the sheep/goats rarely and if they do so, have small size herd which graze in the farm itself. In recent years, stall fed exclusive sheep/goat farms are attractive commercial ventures for many young entrepreneurs in rural areas.

Karnataka State has 9.6 million sheep and 4.8 million goats. Due to their excellent fecundity, their population hasn't gone down despite increasing rate of their slaughter over years. Most of the meat sold and consumed in Karnataka is from sheep and goats. Very rarely they are treated as milch animals due to their poor milk yield. However, in recent years, goat milk is particularly more popular and sold at extra premium rate of Rs.60.00 to Rs.70.00/litre due to recently rediscovered medicinal values in it.

In Karnataka, sheep and goats are rarely stall fed and invariably grazed in forests, gomalas, road side waste lands and even on farms. Hence, their feeding cost is less, coupled with this, they are popularly used for penning, which serves as additional source of income. Most prominent feature of sheep and goat rearing is their fast multiplication. They can multiply at the rate of two off springs every 18 months. The sale of young ones (mostly males) is an attractive source of income. Generally, the income from wool is limited. To summarize, if sheep and goat are well nourished by stall feeding, the returns from sheep and goats rearing are excellent. Most shepherds/farmers do not go for such practice due to lack of own land and investment for construction of sheds/stalls.

The demand for sheep meat is ever increasing due to changed food habits and spending norms both in urban and rural areas. Bulk quantity of meat is sold in cities due to concentrated human population and consistent demand for meat.

In this perspective, the sheep and goat rearing profession has great scope in Karnataka. Further, sheep rearing will be a very good activity in broad spaced horticultural crops such as mango and coconut.

There is an acute necessity to introduce hygienic method of slaughtering the sheep and goat and equally hygienic method of processing and packing the meat for human consumption. Although technology is available for such improvement, the initiatives taken by government and public on adopting such technologies are in a limited small scale for which high tech abattoir to be established at every district.

#### **2.4. SERICULTURE:**

Karnataka is the homeland for sericulture for centuries. Silk production in Karnataka is remarkably high and it produces half of the country's silk. Growing of mulberry, rearing silkworms, marketing the cocoons, reeling of silk from cocoons, silk yarn manufacture, silk weaving are activities traditionally associated with six southern districts since more than two centuries. With sericulture researched as science, large scale improvement in cocoon production, mulberry cultivation, silk-worm seed production and silk reeling are achieved in the last four decades. Traditional districts of Karnataka viz., Mysuru, Chamarajanagara, Ramanagara, Bengaluru Rural, Chickballapura and Kolar have the strong base for sericulture, where almost every village has sericulture profession. In the last 10-15 years, it has spread to non-traditional districts like Tumukuru, Chitradurga, Hassan, Shivamogga, Davanagere. More recently expansion of sericulture is under the way to northern districts like Bagalkote, Vijayapura, Gadag, Belagavi, Ballari, Raichur, Kalaburagi and Bidar. Prominently, sericulture is absent in Kodagu, Dakshina Kannada and

Uttara Kannada districts due to heavy rainfall conditions. Sericulture is practiced by 1.30 lakh farmers in 10800 villages.

Presently, Karnataka has 88,500 ha under mulberry, producing 68759 tons of cocoons and as a result, value of raw silk works out to Rs. 2252.00 crores every years. There is scope to expand sericulture in all districts except coastal and hilly parts of Karnataka.

Sericulture is always a part of farm activity as it invariably needs growing mulberry leaves. But, along with production of mulberry, rearing the silk worms in specifically designed houses involves great amount of skill and labour. Invariably cocoon production takes place in a farm using family labour all round the year. The climatic condition of Karnataka favours the silk worm production in all months of the year. Two key issues in Karnataka's sericulture are making adequate mulberry leaves of proper quality to each batch of silkworm in a year as well as quick disposal of cocoons (after 5 days of cocoon production, as adult moth may crack the cocoons and come out rupturing the silk thread). They have to be sold and used by reeling the thread within 5 days of cocoon formation.

The prospects of sericulture are always toggled with silk import policy in India. The availability of cheap and quality silk in international market induces the silk imports in India to make the silk products cheaper in India. But, this will hamper the silk production at domestic level and thereby the cocoon production by farmers. The demand for cocoon has fluctuated according to import policies coupled with domestic demand. As a result, farmers get very low rates sometimes due to reduced demand for cocoons as they cannot be stored and sold later.

## **2.5. FISHERIES:**

Karnataka State produces 6.13 lakh tons of fishes every year. Out of this, major share (4 lakh tons) is from coastal districts i.e., Dakshina Kannada, Uttara Kannada and Udupi. All other districts have inland fishery units in the water bodies available with them. Among the interior districts with inland fisheries, Davanagere, Shivamogga, Tumkuru, Hassan, Mandya, Ballari and Raichur districts have relatively higher fish production than other districts.

Fisheries has been the profession of 2.15 lakh families (part-time and full-time) in the State dependent on large number of tanks/water bodies. The cold storages essential for fisheries are available in large number in coastal districts (25 numbers with combined capacity of 1325 tons). In other districts, 23 cold storages are available with combined capacity of only 135 tons. However, these facilities are not available in 19 districts, although fisheries activity continues in all these districts. To support fishery activity, fish seed production is being taken up on large scale to produce 312 million fish-lets. There are 602 fish markets in the State, with Bengaluru (132 Nos.) and Udupi (109 Nos.) having the major share. Kodagu district with very low fish production (3800 tons) has as many as 48 fish markets.

## **2.6. AGRICULTURE MARKETING:**

Marketing is the core sector influencing all other sectors. Specifically, agricultural marketing is most important as it has to handle 126 lakh tons of food crops, 10 lakh tons of oilseeds and 23 lakh tons of cotton. Every district has its own agricultural marketing arrangement mainly through APMC markets and sub-markets supported by godowns.

Marketing agricultural produce in Karnataka is through the mechanism of Agricultural Produce Market Committee (APMC) in each district. The sales of agricultural produce takes place through auction by APMC authorities, in which the traders participate and bid highest rates for the produce. Highest bidder will take the produce by depositing the bid amount in APMC and farmer will realise the value for his produce through APMC. APMC facilitates the whole process besides, providing the facilities like yards, godowns, weighing etc. All the agricultural produce in the state is expected to reach the market and subjected to auction. The APMC will levy fixed cess on sale value of every produce to meet its expenses. Although this ideal system is necessary to be followed, some modifications are made in most of APMCs. For example, large quantity of produce does not reach in many APMCs of southern districts but transactions are shown in the records of APMC.

Marketing agricultural produce is an onerous task looking at the volume of produce. Facilitating the sale of agricultural produce needs larger investments on godowns, yards, scales etc., along with good roads. These infrastructure will decide the quality of service made available to farmers. In most districts, taluka places have sub-markets besides main markets in district place. The infrastructures required by all main and sub-markets require larger investments.

Karnataka State being a prime horticultural hub of the country, does not have exclusive markets for horticultural products, although the sector produces more than agricultural sector in terms of weight and value of the produce. Most of horticultural crops, except onion, garlic, ginger do not reach APMC yards and sold by alternate channels. These channels are dominated by private traders and invariably the farmers are at disadvantage in such a situation. Some products like mango, grapes also reach collection points to be transported to

domestic wholesalers or exporters directly. But, in the entire system, government has little control over the system of marketing, weighing, price fixation, payment norms etc. This has been rightly encashed by private traders. As most horticultural products are perishable, a good network of cold storages and processing units with cold chain management system is also necessary to support good marketing system.

Some agricultural crops like sugarcane cannot reach the market and invariably sold to sugar mills directly for production of sugar. Part of sugarcane is used to produce jaggery by large number of farmers who run jaggery manufacturing units. Jaggery produced by farmers is expected to reach APMC for trading. Some APMCs have been dominated by single commodity due to large scale production of such crop in that district. For example, Shivamogga specializing in arecanut market, Tiptur APMC handling coconuts, Raichur and Rannebennur APMC concentrating in cotton, Byadagi for dry chillies. Such APMCs are expected to handle other agricultural produces also when such produce arrives at the market.

Marketing the produce from other sectors like sericulture, fisheries, animal husbandry and even horticulture do not reach regular APMC. They may have separate markets (cocoon markets, fish markets, KMF milk collection centres, egg markets) not under the ambit of working of APMC. However, these markets also need to be strengthened on scientific lines to develop these sectors properly.

## **2.7. IRRIGATION:**

Karnataka's water resources are highly ill distributed. Hilly zone and Coastal zone receiving exceptionally high rainfall (2200 to 4000 mm) while all

dry zones (Zones 1,2,3,4, and 6) receive an annual rainfall of 550-700 mm. The transitional zones (zones 7 & 8) between dry and wet belts receive a rainfall of 750 – 900 mm annually.

Because of these features, the hilly regions are the sources of origin of many rivers and their tributaries. West flowing rivers are shorter and reach the sea within 100 -120 km., while east flowing rivers pass through Karnataka and reach Bay of Bengal through Tamil Nadu or Andhra Pradesh. Due to its upper riparian characters, Karnataka is not able to use entire flow of its rivers. In such circumstances, the expansion of surface irrigation is restricted in Karnataka. Nearly half of irrigated area depends on under-ground water, exploited through open wells and bore-wells.

The state has 3.96 lakh open wells and 8.69 lakh bore wells and 41857 lift irrigation projects as well as 36300 tanks for irrigation. Net irrigated area from these sources are 4.11 lakh ha., 13.21 lakh ha., 93000 ha. and 1.54 lakh ha. respectively. In addition, the State has 12.53 lakh ha under canal irrigation from Tungabhadra, Upper Krishna, Almatti, Tunga, Bhadra, Cauvery, Harangi, Kabini and Hemavathi projects. The total net irrigated area of the State works out to 35.5 lakh ha. from all sources and gross irrigated area works to 41.1 lakh ha. indicating that irrigation intensity is only 115.7 %.

Out of the available open wells (3.96 lakh) more than 75 % of them are dry and not used for irrigation. Belgavi, Vijayapura, Dakshina Kannada, Bidar and Kalaburagi districts have major share of area irrigated by open wells, while in the districts of Bengaluru, Ramanagara, Chitradurga, Kolar, Chickballapur, Kodagu, Dharwad, Haveri and Koppala area under open well irrigated is absent. Tube wells (bore wells) are in almost all districts with their high concentration

in Kolar (84000), Tumukuru (1.02 lakh), Bengaluru (43500), Davanagere (43200), Hassan (46000), Belagavi (43500) and Haveri (44500) districts. while open wells irrigation has irrigation intensity of 112 %, bore well irrigation has intensity of 117 %.

The state has large number of lift irrigation projects, lifting the water from rivers. However, the irrigation from such projects is around 93000 ha. The canal irrigation from all major irrigation projects provide irrigation to 12.53 lakh ha. (net rea) with a irrigation intensity of 117 %. Out of gross irrigated area, the major share of irrigated area is in Raichur, Ballari, Bagalkote, Vijayapura, Belagavi and Davanagere districts (total of 20.19 lakh ha. out of 41.1 lakh ha.), Kodagu has minimum irrigated area of only 1785 ha.

The future scenario of agriculture and allied sectors depend mainly on three factors:

- i. Moisture:** Increasing irrigation facilities through area expansion and/or increasing irrigation efficiency through micro irrigation systems needs top priority. In rainfed ecosystem, every drop of rain water need to be conserved, stored and reused in critical stages of crop growth for enhancing crop productivity. Since, Karnataka has nearly 66% area under dry lands, all efforts to use rain water efficiently is the need of the hour. Krishi bhagya, a flag ship programme of Karnataka Government is being implemented by all departments in convergence to improve livelihood of dry land farmers.
- ii. Mechanisation:** In view of large scale migration of rural population to urban areas in search of employment and livelihood, agriculture sector faces huge labour shortage to carry out field operations at the right time. More emphasis needed to be given on mechanisation. In this regard,

efforts of state government in providing about Rs.500.00 crores for mechanisation is noteworthy. The novel scheme of 'Krishi Yantra Dhare' of Department of agriculture, wherein Custom Higher Service Centres (CHSCs) are planned to be established at Raitha Samparka Kendras (RSKs-769Nos.) at sub-block level. These centres will provide required farm machinery to farmers on rent basis, so that timely field operations can be taken up.

- iii. Market:** Market is another important sector which decides the fate of the farming community. Market includes primary processing, storage (with cold chain facility), processing value addition, packing and finally sale of produce in the market with good marketing network.

In order to achieve greater success in agriculture and allied sectors and to retain rural youth in villages, it is imperative to give more emphasis on efficient and effective management of these three Ms, which are in addition to inputs, timely operations and safety nets – credit and insurance.

### *Chapter III*

## **ROLE OF INFRASTRUCTURE: CURRENT STATUS AND CONSTRAINTS**

The role of infrastructure in agricultural and rural development is well recognized by India's planners and policy makers. The studies unanimously confirm that rural infrastructure is a *sine qua non* for significantly improving the quality of human life and phenomenally accelerating the process of agricultural development. Rural infrastructure has direct and strong relationship with farmers' access to institutional finance and markets, besides, increasing crop yields, thereby promoting agricultural growth. Agricultural infrastructure has the potential to transform the existing traditional agriculture or subsistence farming into a most modern, commercial and dynamic farming system in India.

Infrastructure are often defined as 'basic facilities, services and installations needed for the functioning of a community'. They include all facilities and services to support the activity of a sector. They also include civil structures like buildings and roads as well as various installations facilitating communication, measurement, assessment, reorganisation, processing, conversion, value addition, packing and supervision. The infrastructure development will also include smooth and economically feasible delivery of services to effective functioning of a sector.

Adequate infrastructure raises farm productivity and lowers farming costs and its fast expansion accelerates agricultural as well as economic growth rate. It is acknowledged that infrastructure plays a strategic role in producing larger multiplier effects in the economy with agricultural growth. It is estimated that a 1% increase in the stock of infrastructure is associated with a 1% increase in

GDP across all countries. The level of both physical and institutional infrastructure significantly influences the spread of proven and demonstrated yield enhancing agricultural technology.

Specific role of infrastructure needed to develop agricultural and allied sectors in Karnataka are listed as under:

- Facilitate measurements and help the farmers to assess the quantity in an unbiased manner to predict the outcome (for example weighing of produce in electronic balances).
- Facilitate communication by the use of latest gadgets of telecommunication to receive or convey specific messages instantly to help functioning of a sector (for example internet or message services).
- Modernize the trading activities helping the farmers/traders to instantly decide and convey the decisions to initiate the action as early as possible (for example e-trading and internet auctions).
- Process the goods and pack them for easy presentation in the market to facilitate the consumers besides, adding value to the product (for example cashew are cleaned, graded and packed in attractive pouches).
- They include installations – which convert a material into other products used by consumers to ultimately help the consumer and farmer (for eg., conversion of ragi into ragi malt, tomato fruit into tomato ketchup).
- Provide facilities to store the products safely for longer period without deterioration so that they could be sold/processed at a later date (for eg., godowns/cold storage for various agricultural products).
- Provide a place designed to discharge functions like auctioning/marketing along with all necessary facilities for specific activity (for eg. rural shandies could be strengthened and facilitated in scientific and hygienic way).

- Provide a good and efficient logistic support for movement of goods from one place to place either to market or process or consume (for eg., good carriers, refrigerated vehicles).
- Include testing facilities to assess the quality of product thereby help in fixing better rates in the market (for eg., lactometer used to assess TDS or brix refractometer to test the maturity of canes).
- Include buildings and necessary furniture to facilitate the capacity building activities (for eg., training school to demonstrate specific skills).
- Include sophisticated laboratories to undertake various physical, chemical and biological tests on a product or other objects to arrive at specific interventive suggestions/advices (for eg., soil testing laboratory, pollution testing laboratory).
- Provide facilities created for specific services required by sector (for example insurance, banking service).
- They may also include facilities for veterinary services like vaccination/insemination, treatment of diseases, accident care etc.,

Agricultural infrastructure primarily includes wide range of public services that facilitate production, procurement, processing, preservation and trade. Agricultural infrastructure can be grouped under following broad based categories.

- **Input based infrastructure:** Seed, Fertilizer, Pesticides, Farm equipment and machinery etc.
- **Resource based infrastructure:** Water/irrigation, Farm power/energy
- **Physical infrastructure:** Road connectivity, Transport, storage, processing, preservation, etc
- **Institutional infrastructure:** Agricultural research, extension & education technology, information & communication services, financial services, marketing, etc.

Infrastructure are back-bone of development. No improvement of a sector or its activity can be achieved in absence of necessary infrastructure. In most situations, creation of basic infrastructure may be insufficient to derive full services from such activities, unless regular allotment of budget is made to make them functional. Infrastructure should match with relevant technically competent manpower. A service is derived and utilized from an infrastructure only when it is managed well. This makes the infrastructure support services in future years as mandatory for any kind of infrastructure programme.

Many concurrent programmes are run in government with same target group and similar agenda of improvement. Development of SAIDP offers the holistic and congruent scenario of infrastructure development in agriculture and allied sectors in the district.

Improved infrastructure leads to expansion of markets, economies of scale and improvement in factor market operations. The majority of studies recognize that infrastructure investment has a strong impact on rural incomes and especially on small holders. A recent study about the impact of infrastructure on agricultural development indicated that transport, power, irrigation and research infrastructure were four critical components that affected the agricultural productivity in a significant manner. With improvement in access to power, irrigation facilities substantially improved, particularly through massive energisation of pump-sets. In turn, improved irrigation facilities, coupled with research input enhanced agricultural productivity. Irrigation infrastructure increases the land use and cropping intensity, and provides incentives to farmers to use yield enhancing inputs and thus, results in higher agricultural output

A study related to the impact of the Government expenditures on agricultural research & development, irrigation, roads, education, power, soil & water conservation, on agricultural growth and rural poverty concluded that expenditure to improve infrastructure and disseminate technology had contributed to agricultural growth. Government expenditure on road and R&D had by far the largest impact on poverty reduction and growth in agricultural productivity. Studies in India document positive linkages between various types of infrastructure and agricultural output growth. Rural infrastructure [both physical & institutional] such as irrigation watershed development, rural electrification, roads, markets, credit institutions, rural literacy, agricultural research & extension together play a key role in determining agricultural output in India. A classic study by Bhatia [1999] showed that Indian States with the highest rural infrastructure index [a composite measure for rural electrification, roads, transport, health, irrigation, farm credit, fertilizer, agricultural marketing, research & extension] such as Punjab, Haryana & Tamil Nadu have the highest food grain productivity per hectare and the States with the lowest index such as Rajasthan, Bihar & Madhya Pradesh have the lowest food grains productivity per hectare; the rural infrastructure index explains about 68% of the variability in the yield in different States; and 10% improvement in rural infrastructure index in States with lower score would increase their food grains productivity by about 470 kg / ha on an average.

Agriculture and allied sectors in Karnataka have large number of infrastructure helping in production, storage and marketing of products of agriculture/allied sectors (Annexure II). Animal husbandry sector has maximum number of infrastructure as compared to other sectors, while irrigation sector is very poorly equipped with infrastructure. Sector-wise variation in infrastructure

may be due to specific features of sector or may be due to poor development of such sector. But district-wise variation in infrastructure are invariably due to poor initiative taken by concerned implementing authority or due to poor allotment of funds. Instances are also available, where an existing infrastructure is poorly utilised and has not contributed to particular sector in significant way, due to shortage of manpower or paucity of funds to manage the facilities. Existing number of infrastructures are expected to be managed well and to be supported by new investment for additional infrastructure in the relative sector.

The constraints in the infrastructure across the sectors and across the districts can be summarised as follows:

- Insufficient capacity of existing infrastructure and insufficient number of units looking to the size and requirement of a sector.
- Absence of some infrastructure totally in some sectors or districts – which has hampered the growth in such sectors.
- Scope to add few additional infrastructure to the existing facility to strengthen such support.
- Absence of trained manpower, absence of repair and maintenance of existing infrastructure.
- Anomaly regarding extra focus on one sector and negligence of other sector in respect of providing infrastructural facilities, leading to sectoral imbalance.
- Inadequate fund allotment for adding a new infrastructure or maintaining the available infrastructure.
- Modernisation of many infrastructure looking to easily usable technically useful latest products available in market.
- Severe shortage of manpower to run the infrastructure in some sectors.

- Non-availability of power and quality of power to derive benefits from existing infrastructure.
- Failure to utilize the existing facilities by authorities.
- Problems to educate the staff and farmers on existing infrastructures and their utilities.
- Repairs/maintenance of existing infrastructure.

### **Innovative Approach:**

The importance of rural infrastructure in important sectors like irrigation, roads, bridges etc. was well recognized particularly in the context of the urgency for stepping up agricultural growth rate at 4.5% in the 9th Five Year Plan. Lack of financial resources with the State Governments, which are primarily responsible for its creation, development and maintenance, is significantly the constraining factor. The Government of India, created “Rural Infrastructure Development Fund”[RIDF] to be operated and managed by NABARD.

The RIDF was set up in the NABARD with an initial corpus of Rs.20 billion in terms of an announcement made in the Union Budget for the year 1995-96 [RIDF-I]. The Fund was primarily created to extend loans at concessional rates of interest to State Governments to enable them to complete various types of infrastructure projects in the field of irrigation, flood protection, rural roads and bridges, which were started in the past but could not be completed for want of funds. From 1996-97[RIDF-II], the Fund is also used to take up new rural infrastructure projects, in addition to completion of old projects. Presently, RIDF is funding following activities covering almost all components of rural infrastructure.

In the recent past on the suggestion of NDC, Government of India introduced Rashtriya Krishi Vikas Yojana (RKVY) during the XI five Year Plan and provided liberal financial assistance to incentivise State Governments to increase outlay for agriculture sector so as to accelerate growth rate of agriculture. The RKVY guidelines for XII Five Year Plan suggest nearly 35 per cent of RKVY funds to be used for the development of agriculture infrastructure.

Lack of adequate infrastructure continues to constrain diversified agricultural growth in most places in India. Therefore, development of agriculture infrastructure should get priority in investment planning.

## CHAPTER IV

### SECTORAL INFRASTRUCTURE AND INVESTMENT

#### 4.1. Guiding Principles for Investment

The investment decisions for infrastructure development are based on felt needs of the all the stake holders. During the consultation process with farmers, researchers, officials of agriculture and allied sectors, it was discussed about the need and utility of the investment and finally narrowed down to important once in each sector. The investment suggested for infrastructure development in major sectors through various schemes is presented below.

#### 4.2. Proposed Allocation of Funds for Infrastructure Development by Sectors

**4.2.1. Agriculture:** Though the share of agriculture in GDP is declining over the years, it is most important sector of Indian economy. Agriculture not only safe guard food security but influence the growth rates in other sectors of the economy through its backward and forward linkages. Around 65 per cent of the population is dependent on agriculture for their livelihood and nearly half of the labour force is engaged in agriculture. However, infrastructure development in agriculture is lagging behind and needs to be developed so as to achieve accelerated and sustainable growth in long run. The infrastructure development and investment required is presented in Table 4.1.

##### a). Agriculture Mechanization and Custom Hire Centres

Due to shortage in farm workers, farmers are not in a position to undertake various field operations in time. Hence, modernization of agriculture through Agricultural Mechanization is inevitable. Availability of farm power coupled with efficient and judicious use of farm implements/ machinery enable

efficient utilization of various inputs such as seeds, fertilizers, plant protection chemicals and water for irrigation, besides, eliminating the drudgery in various farm operations from land preparation to post harvest technology and value addition.

Productivity of the farm depends considerably on the availability of farm power and its efficient use. The States which have higher farm power availability per hectare show higher productivity. The Agricultural Mechanization is the only way out to face the challenge of farm workers' shortage. The educated youth feel discouraged to work in farms due to human drudgery. Migration of farm workers from rural to urban areas for other works is a common phenomenon in Karnataka. Farm mechanization has been helpful to bring about significant improvement in agricultural productivity by bridging the demand-supply gap of farm workers. The increase in food grains production is possible only when heavy demand for tractors, power tillers and other Agricultural machinery / implements by the farmers are met.

Farm machinery like tractors, power tillers, rotovators, etc., are supplied to the farmers with subsidy. However, majority of the farmers are small and marginal farmers. These resource poor farmers neither afford to buy costly farm machinery nor it is economical owing to small size of holding. Hence, Custom Hire Centres (CHSC) fits the bill. The farmers can hire the required machine/equipment to complete the farm operations. These CHSC are equipped with all the major machinery and equipment like Tractor trolley, tractor, cultivators, rotovators, seed drills multi crop thresher, paddy transplanter, nursery media filling machine, reaper, post hole digger, planters, tree pruners, and power tiller driven equipments etc. An investment of Rs. 439.73 crore is suggested during the perspective five year plan (Table 4.1)

**Table4.1: Infrastructure Development and Investment Suggested in Agriculture**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds Proposed (Rs. in Crore)</b>
<b>Agriculture</b>	Farm Machinery & CHSC	439.73
	Micro irrigation	403.27
	Agro processing	180.70
	Harnessing Solar energy	232.94
	Establishment of laboratories	16.00
	Strengthening of training Centres	31.65
	Soil & Water conservation	573.83
	<b>Sub Total</b>	<b>1878.12</b>

**b). Micro Irrigation:**

Water is the most critical and precious input for cultivation of crops. The availability of water for irrigation is the deciding factor for production and productivity in Agriculture. However, the conventional irrigation system has not only resulted in poor yield and poor water use efficiency but also led to wastage of huge quantity of water. The Policy paper on rain-fed agriculture advocates support to micro Irrigation for increasing the water use efficiency. Considering the importance, it proposed to expand the area under micro irrigation in the State. The Government of India and the State government provide subsidy for the purchase of micro irrigation system. A budget of Rs. 403.27 is suggested for five year perspective plan period.

### **c). Agro/ Food Processing**

Food processing in the organized sector helps in achieving higher efficiency in the use of raw materials and by-products. Processing in the organized sector generates additional employment in trade and transport activities which may be quite substantial as compared to direct employment created in processing activities. Food processing is promoted in our State to reduce the wastage of agricultural produce, fetch remunerative price to the farmers and to ensure processed foods to the consumers throughout the year.

Agro Processing Units with farmers and private participation would be established to minimize post harvest losses and maximize benefits from agricultural produce. “Agro Processing Units are to be established at district and taluk headquarters for different agriculture produce like pulses, maize, etc. An allocation of Rs. 180.70 crores is suggested for the years of the perspective plan.

### **d). Harnessing Solar Energy to increase farm Efficiency**

Karnataka is endowed with abundant sunshine hours, solar water pumps are ideal for agriculture and related activities. Solar powered pumps are alternative to conventionally powered systems that can provide continuous pumping throughout the day for a maximum period in a year. It has been proposed to encourage and popularize the use of solar energy in Agricultural sector by providing a package of Solar PV Pumping System linked with suitable Micro Irrigation System along with forward linkage of precision farming / front-end technologies, crop specific improved cultivation methods etc., to the farmers of the State. It is suggested to provide 3 HP / 5 HP solar PV pumping system. Each pump will have a solar panel of 4800 Wp capacity and will deliver water equivalent to that of a 5 HP AC submersible pump set. It is suggested to invest Rs. 232.94 crore during the plan period.

#### **e). Establishing Laboratories**

It is proposed to establish new and strengthening of the existing Soil, Water, Seed, Fertilizer and Pesticide testing laboratories at the selected district places so as to facilitate farmers and government agencies to carryout testing of the samples. Soil testing will help farmers in decision making about cropping plan and application of minor and micro nutrients to harvest maximum output per unit area. A budget of Rs. 16.00 crore is proposed for the entire plan period.

#### **f). Strengthening of Training Centres**

In the context of world scenario towards organically produced food, Organic Farming is gaining importance. Organic Agriculture means, a process of developing a viable and sustainable agro eco system, which can achieve sustainable productivity without the use of artificial external inputs such as chemical fertilizers and pesticides. Sufficient quantities of biodegradable material of microbial, plant or animal origin should be returned to the soil to increase its fertility and the biological activity. The primary objective of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people.

Department of Agriculture conducts training and orientation programmes for the staff of the department. Similarly, department also organizes training programmes for farmers on different aspects of farming like organic agriculture, integrated farming system, compost making, crop husbandry, IPM, INM, etc. It is suggested to invest Rs. 31.65 crore for establishing and strengthening existing facilities in the selected districts.

### **g). Soil and Water Conservation**

Karnataka consist of large tract of drought prone area next to Rajasthan. About two third of the area in state is under rain-fed agriculture. Conservation of rain water and prevention of soil erosion assume greater importance. Measures to conserve rain water in-situ and to improve ground water level therefore become important to overcome the vagaries of monsoon and thereby to stabilize crop yields and farm income. Besides soil and water conservation, suitable production systems involving crops, fruits and forest species are also needed. All these activities are coordinated on watershed basis.

Karnataka has given an important place for watershed development since 1980s. It has set up a separate watershed development department since 1996. Various watershed programmes are under implementation in the state and the district. The focus of this programme is to conserve soil and moisture and to put lands to the best use according to their capabilities to improve the overall productivity of the catchment holistically. A budget of Rs. 573.83 crore is suggested for the development of watershed in the state.

#### **4.2.2. Horticulture**

Horticulture is a growth engine for Agriculture sector and the way to attain nutritional security in the state. Consumption rate of fruits and vegetables is showing an upward trend because of greater awareness among the people on healthy diet and also increase in purchasing power. This necessitates the farmers to make a shift from traditional farming to commercial cultivation of horticulture crops. The contribution of horticulture produce in the State's Gross Domestic Product is very significant. The varied agro climatic conditions favour the cultivation of extensive array of Horticulture crops. However, lack / shortage of infrastructure facilities impede the growth of horticulture. Hence, it

is imperative to improve infrastructure facilities in the state. The infrastructure development and estimated investment is provided in Table 4.2 below.

**a). Protected Cultivation**

Fruits, exotic vegetables and flowers are high value low volume crops. The productivity as well as quality of the horticulture produce can be enhanced to get the premium price in the market. It is proposed to promote protected cultivation of horticulture crops under poly-houses and shed-nets under controlled conditions. A provision of Rs. 542.81 crore is suggested in the perspective plan to accomplish the task.

**b) Mechanization of Horticulture**

Availability of farm power coupled with efficient and judicious use of farm implements/ machinery enable efficient utilization of various inputs such as seeds, fertilizers, plant protection chemicals and water for irrigation besides eliminating the drudgery in various farm operations from land preparation to post harvest technology and value addition. Productivity of the farm depends considerably on the availability of farm power and its efficient use. It is proposed to mechanize the farm operations in horticulture sector in the state by investing Rs. 132.95 crore during the plan period.

**Table 4.2: Infrastructure Development and Investment Suggested in Horticulture**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs. in Crore)</b>
<b>Horticulture</b>	Protected cultivation	542.81
	Farm Mechanisation	132.95
	Micro irrigation	224.10
	Post harvest Management, Cold storage, pack house, etc.,	464.98
	Strengthening of Training Centres	8.00
	Establishment/strengthening of labs	41.10
	Agro processing Unit	142.00
	Strengthening Market net works	23.40
	<b>Sub Total</b>	<b>1579.34</b>

**c). Micro Irrigation**

To give sophisticated touch to traditional agriculture system, adoption of multipurpose drip system is the main development in agriculture during 20<sup>th</sup> century. This system facilitates saving of water along with ensuring higher crop yield. Micro irrigation is a localized irrigation method that saves water and fertilizer and is being popularized to a larger extent due to the added advantages of minimal soil erosion, reduced weed menace, uniform water distribution, maintenance of optimum plant population and increase in productivity & quality of agricultural produce. This micro irrigation system is used now a days in coconut, Areca nut, Banana, Mango, Sapota, Guava, Vegetables and Flowers and such other crops. It is suggested to invest Rs. 224.10 crore for the development of micro irrigation with automation in the state during the perspective plan.

#### **d). Post Harvest Management**

Since horticulture produces are more perishable in nature, thrust is now being given to project based activities. 'Post Harvest Management' wherein focus on post harvest losses and promotion of Farmer Producer Organizations (FPO) and their tie up with Market Aggregators (MAs) and Financial Institution (FIs) to ensure support and adequate returns to the farmers are contemplated. The investment suggested for creating infrastructure facilities like pre-cooling, cooling, cold storages, pack houses, etc. It is proposed to allocated Rs. 464.98 crore to create post harvest management facilities.

#### **e). Strengthening of Training Centres**

Department of Horticulture conducts training and orientation programmes for the staff of the department. Similarly, department also organizes training programmes for farmers on different aspects of horticulture like disease and pest management, training and pruning, advance techniques of cultivation of vegetable and fruit crops, Kitchen gardening, nursery management, budding and grafting techniques, IPM, INP, processing of fruits and vegetables, etc for new entrepreneurs. However, most of the district does not have training facilities and hence, it is proposed to create infrastructure facilities for training. An allocation of Rs. 8.00 crore is suggested to create infrastructure facilities at the selected districts.

#### **f). Establishing Laboratories**

It is proposed to establish new and strengthening of the existing laboratories at the selected district places so as to facilitate research at the decentralized level. The research facilities needs to strengthened. A budget of Rs. 41.00 crore is proposed for the entire plan period.

### **g). Processing Units**

Horticulture produce is perishable in nature. It creates glut in the market during harvest season and depresses the prices. The processing of horticulture produce would not only facilitate value addition but also improve the shelf life of the product. It also helps in handling the final product. It is proposed to create new infrastructure facilities for processing of horticulture produce in the selected districts and modernize the existing facilities replacing the old and obsolete technology. An investment of Rs. 142.00 crore is suggested to create the required infrastructure.

### **h).Strengthening Market Net Work**

Public and Private Entrepreneurs will be engaged as Market Aggregators to collect, sort, grade and pack the vegetables at the farm gate and to supply them to the retail outlets established by them in the city. This scheme is implemented in a Public Private Partnership (PPP) mode. Vegetable cultivation in open as well as protected cultivation, Post Harvest Management facilities viz., low cost onion storage structure, Reefer vans and Pack house besides marketing facilities such as Collection centres and Retail outlets are the major components.

### **4.2.3. Animal Husbandry**

Livestock economy and Agricultural economy always go hand in hand in food security of the nation. Increase in human population, increase in the purchasing power and the changing life styles have led to increased demand for animal products as food. Livestock production always acts as a buffer in case of crop failure. The infrastructure needs ascertained and proposed to develop are

shown in Table 4.3. A brief discussion about infrastructure development is presented below.

**a). Establishing Meat Market with Modern Abattoir**

The meat markets in the district are unhygienic and animals are slaughtered in the open or in unhygienic places. It is proposed to establish modern high tech abattoirs in all the district with modern meat market. A budget for Rs. 298.85 crores is proposed to create the infrastructure facilities.

**b). Promoting Marketing of A-2 Milk**

A2 cow's milk only contains the A2 type of beta-casein protein, rather than the A1 protein commonly found in regular milk. African and Asian cattle produce mainly A2 beta-casein, the A1 protein is common in herds in the US, Australia, New Zealand and most of Europe. A genetic test will determine whether a cow produces the A2 or A1 type protein in its milk - allowing farmers to selectively breed the dairy cattle they want. It is presumed that the A2 milk is better for human consumption. Indian breeds of cattle invariably produce A2 milk. It is proposed to promote collection, processing, packing and marketing of A2 milk separately with a price premium like organic produce from agriculture and horticulture. This can be achieved through Self Help Groups or by forming Farmer Producer Organizations. It is proposed to allocate Rs. 112.07 crore for the entire period of five year perspective plan.

**c). Establishing and Strengthening of Meat Markets**

The meat markets in the district are unhygienic and animals are slaughtered in the open or in unhygienic places. It is proposed to establish modern high tech meat markets at the selected taluks in the state. The

investment for development of modern meat marketing facilities as well as strengthening the existing one is estimated at Rs. 259.95 crore.

**Table 4.3: Infrastructure Development and Investment Suggested For Animal Husbandry and Veterinary Sector**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs in crore)</b>
<b>Animal Husbandry</b>	Establishment of Abattoirs	298.85
	Processing , packing of A2 milk	112.07
	Establishment & Strengthening of Meat Markets	259.95
	Establishment of AI Centres	36.45
	Establishment/Strengthening of Labs	15.00
	Establishment of disease diagnostic centre	48.00
	Supplying milking machines/ equipment	17.15
	Mobile Veterinary clinics	3.00
	Establishment/Strengthening of training centres	12.75
	Strengthening Chilling Centres	83.00
	Establishment/strengthening of Cattle feed Units	112.85
	<b>Sub Total</b>	<b>999.07</b>

**d). Development of Infrastructure for AI facilities**

The success of artificial insemination in domestic animals mainly depends on maintenance of critical LN2 level in various veterinary institutions.

This requires proper LN2 containers and carriage systems especially at taluk level and a LN2 silo at district headquarters. It is proposed to increase the number of AI centres in the district for up gradation of cows. It is also proposed to improve infrastructure facilities at the veterinary hospitals and clinics by providing LN2 silo facilities, X ray machines and other necessary equipments for better diagnosis. It is proposed to invest Rs.36.45 crore for opening new AI centres in the district and improve infrastructure facilities in the existing centres.

**e) Establishment / Strengthening of Laboratories and Establishment / Strengthening of Disease diagnostic Centres**

It is proposed to establish laboratories and disease diagnostic Centres with modern infrastructure facilities and up-grade and modernize the infrastructure a high tech training centre with disease diagnostic facility and vaccine production facilities at selected districts in the state. Disease diagnostic centre will save precious time for treatment of cattle in the district. An allocation of Rs. 63.00 crore is suggested in the budget for perspective plan period.

**f) Supplying Milking Machines/ Equipment**

Lack of skilled labour for milking cattle as well as shortage of other unskilled man power impinges upon the expansion of livestock industry. It is also desirable from the point of hygiene. Use of milking machines is supposed to be more hygienic and clean. It is proposed to supply milking machines, cans, sterilizing machines and equipments as well as pressure pipes for cleaning animal sheds. It is proposed to invest Rs. 17.15 crore during the for the proposed perspective plan.

### **g) Mobile Veterinary Clinics**

The government of Karnataka introduced a mobile veterinary Clinics in the state with aim of providing door to door service to the owners of live stock. It is an emergency service provided by the veterinarians those who cannot bring their animals to the clinic for expert advice and treatment. The government had announced the launch of 24 X 7 animal ambulances in rural areas, as part of the Dhanvantri scheme. On an average, Karnataka has one has only one mobile veterinary clinic per taluk, which also doubles as an emergency vehicle. Most farmers have to depend on private vehicles to take their cattle and farm animals to veterinarians.

It is proposed to increase the number of Mobile Veterinary Clinics so as to provide door to door emergency service for animals in the remote villages. It is proposed to invest Rs. 3.00 crore for expanding the number of mobile veterinary clinics in the state and strengthen infrastructure in the existing clinics. It is proposed to invest Rs. 3.00 crore.

### **h). Establishment and Strengthening of Training Centre**

Periodical training programme for farming community should be conducted at taluk and village levels regarding dairying, goat rearing, piggery and poultry etc. and that will play a vital role in improving economic condition. Existing infrastructure for effective veterinary extension activities is meagre and hence providing infrastructure for extension activities at taluk level is a must. It is proposed to establish high tech training centres at the selected district to conduct training and reorientation programmes for the department staff. The total investment for creating these infrastructure facilities is estimated at Rs. 12.75 crore.

### **i). Establishing and Strengthening of Chilling Centres**

Milk chilling centre is a link between producer and the consumers. The quantity of milk collected by the milk cooperative societies is increasing day by day and the facilities at the existing chilling plants are under stress. It is suggested to establish new chilling plants and strengthen and expand the capacity of existing chilling plants. The budget required to create new infrastructure and expand the existing centres is Rs. 83.00 crore.

### **j). Establishing and Strengthening of Cattle Feed Units**

Increased production of milk and poultry is creating demand for feed and concentrates. The farmers maintaining livestock and having poultry farms are complaining of high cost feed and concentrates and are advocating to have cattle feed mixing unit in their neighbourhood / districts. Some of the district are producing maize in large quantities which can be used in cattle feed. It is suggested to invest Rs. 112.85 crore for creating new infrastructure and expanding the capacity of the existing units.

## **4.2.4. Fisheries**

Karnataka has potential to develop both inland fisheries due to presence of large number of irrigation tanks and reservoirs as well as marine fisheries as it has a long coast line. The lack of infrastructure facilities impedes the growth of fisheries in the state. The investment needed for infrastructure development is depicted in Table 4.4.

### **a). Fish Ponds and Rearing Centres**

It is proposed to promote Integrated Composite Fish Culture Ponds wherein farmers grow mixed culture with Rohu, Katla, Mrugal and Common

carp which feed at different levels / layers and do not compete with each other for food. This helps in maximizing fish output from the unit area.

Similarly, demand for fish seed / finger lings are not met by the production in the state has to obtain from the neighbouring states. Development of fish farms for disease free finger lings would help the grower. Hence, it proposed to create seed production facilities as well as expand inland fisheries in the state by providing financial assistance to farmers. It is proposed to invest Rs. 87.35 crore for the development of inland fish culture ponds with integrated composite fish culture and seed farms during the proposed five year plan.

#### **b). Strengthening of Fish Markets and Cold Storages**

The fishermen engaged in fishing sale their fish catch in rural shandies or at taluk markets. Even the fish catch from reservoirs has to be disposed off immediately due to lack of cold storage facilities. It is proposed to provide refrigerated vans for collection of fish catch and develop fish markets with cold storage facilities in all the taluk headquarters. A budget provision of Rs. 111.09 crores is suggested for creating infrastructure facilities during the perspective plan period.

**Table 4.4: Infrastructure Development and Investment Suggested For Fishery Sector**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs. in crore)</b>
<b>Fisheries</b>	Fish ponds/rearing centres	87.35
	Strengthening of fish markets/Cold storage	111.09
	Promotion of fish processing	1.40
	Training centres	5.00
	Fishing Net & Motorised boats	47.25
	<b>Sub Total</b>	<b>252.09</b>

### **c). Promotion of Fish Processing**

Lot of fish is exported from Karnataka to other countries and also supplied to other cities for domestic consumption. It is proposed to promote processing of sea food for value addition. The processing units for fish and prawn like fish canning, extraction of fish oil and preparing fish meal, prawn processing and packing can be undertaken in the state, especially in coastal districts. The processing and value addition can be taken up under PPP mode or by Self Help Groups / fishermen Cooperative Society. An investment of Rs 1.40 crore is suggested during the plan period.

### **d). Training Centres**

The Fisheries department does not have sufficient infrastructure to organize training programmes for farmers, fishermen and entrepreneurs interested to take up aquaculture activity. The training on various aspects of fish farming like rearing of fish, processing, storage, and marketing is essential. It is suggested to create training facilities with the fishery department at the selected districts in the state with a total investment of Rs. 5.00 crore during the five year perspective plan.

### **e).Providing Fishing Nets and Motorised Boats**

The fish catch obtained by traditional boats is very low compared to mechanized boats and hence the income. It is proposed to assist fishermen operating traditional boats to modify their boats to motorized one. Similarly, provide financial assistance to buy modern fishing boats and nets for improving the fish catch. An allocation of Rs. 47.25 crore is suggested for the perspective plan period.

#### **4.2.5. Sericulture**

Sericulture is one of the most important economic activities in Karnataka. More than three fourth of mulberry silk production emanates from Karnataka. Southern districts in the state are at the forefront in silk cocoon production and the government is promoting mulberry cultivation and silk cocoon production in the non-traditional district as the sericulture provides steady income throughout the year. It also generates employment at different stages of value addition. The suggested infrastructure development and investment required is shown in Table 4.5

##### **a). Establishment of Cocoon Markets and Development of Marketing Infrastructure**

Mulberry cultivation and production of silk cocoon is being promoted to non-traditional areas in the state. However, markets for silk cocoon are very few. The sericulturists have to carry their produce to far away markets. Silk cocoon is a perishable produce as the pupa after completing its life cycle breaks open the cocoon and comes out as an adult. In the process, cocoon is damaged and is not suitable for reeling. Hence, density of cocoon markets needs to be increased in the selected districts. Similarly, marketing infrastructure in the existing cocoon markets needs to be improved. The investment required for the development of cocoon markets and upgrading infrastructure is estimated at Rs. 25.00 crore.

##### **b). Micro irrigation subsidy:**

Ground water level is decreasing significantly in the district. By providing drip irrigation to mulberry garden the quality of mulberry can be improved. The subsidy which is given in Catalytic Development Programme is not

sufficient. Hence, additional requirement is proposed in this scheme. It is proposed to expand micro (drip/sprinkler) irrigation facilities for mulberry cultivation in the state. The total investment envisaged for creation of additional micro irrigation infrastructure is Rs. 14.40 crore.

**Table 4.5: Infrastructure Development and Investment Suggested For Sericulture**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs. in crore)</b>
<b>Sericulture</b>	Establishment of Cocoon Markets and Upgrading Infrastructure facilities in the existing Cocoon Markets	25.00
	Micro irrigation	14.40
	Rearing units & mountages	44.14
	Mechanisation	19.25
	Strengthening training Centres	10.50
	Establishment of Pupa processing centre	4.90
	Marketing Infrastructure	12.00
	Automatic Reeling Machines	31.50
	<b>Sub Total</b>	<b>149.69</b>

**c). Rearing Units and Mountages**

Government of Karnataka is promoting expansion of area under mulberry cultivation and increase silk cocoon in the state. It is proposed to provide incentive / financial assistance for taking plantation of mulberry, expansion in the existing area, construction of rearing houses and for mountages. The funds required will be Rs. 44.14 crore.

#### **d). Mechanization**

Due to shortage in farm workers, farmers are not in a position to undertake various field operations in time. The Agricultural Mechanization is the only way out to face the challenge of farm workers' shortage. The educated youth feel discouraged to work in farms due to human drudgery. The total investment for mechanization of sericulture is estimated at Rs. 19.75 crore.

#### **e). Strengthening of Training Centres**

The training centres do not have sufficient infrastructure to organize training programmes for silk cocoon producers (sericulturists), reelers, etc. The training on various aspects of mulberry cultivation, rearing of silk worm, disinfection of rearing rooms and mountages, It is suggested to create training facilities for sericulture department at the selected districts in the state with a total investment of Rs. 10.50 crore during the five year perspective plan.

#### **f). Establishing Pupa Processing Centres**

A lot of wastage is created in the process of processing silk cocoons. The pupa from the cocoons is a waste. However, this can be put to better use for preparing cattle feed / poultry feed, compost, etc. It is proposed to establish pupa processing units at the selected reeling centres in the state. An investment of Rs. 4.90 crore is proposed during the perspective plan.

#### **g). Automatic Reeling Machines**

Most of the reeling centres use filatures / manually operated machines for reeling silk. This more time consuming as well as arduous job. It is proposed to assist reelers to purchase reeling machines. The estimated investment required is estimated at Rs. 31.50 crore.

#### 4.2.6. Agricultural Marketing

Marketing is the important link between the produces and the consumers. Infrastructure development impinges upon price formation, efficiency of marketing, etc. The development of marketing infrastructure and the investment required is presented in Table 4.6.

##### a). Construction of Godowns / Cold Storages/ Improvement of Village Shandies, etc

Capital intensive marketing infrastructure is necessary for protecting the agricultural produce from harvest season to consuming period. Inadequate scientific storage facilities cause heavy losses to farmers in terms of quantity and quality. Hence, it is essential to protect the agricultural produce from deterioration. Seasonal fluctuations in prices aggravate in the absence of these facilities. Farmers can store their agricultural produce in the godowns and get credit facilities in the form of pledge loan. The State Government has taken various steps in the past to further strengthen the agriculture markets.

**Table 4.6: Infrastructure Development and Investment Suggested For Marketing Sector**

Sector	Infrastructure Component	Funds proposed (Rs in crore)
Agriculture Marketing	Construction of Godowns, Cold storage, and development of infrastructure facilities in rural shandies, etc	1234.11

A large number of main and sub-markets in the state lack important infrastructure facilities like storage godown and cold storages, drying yards,

weighing plat forms, wash rooms, drinking water facilities, etc. It is suggested to establish these facilities in the main and sub-markets and improve /upgrade in the places. Similarly, the amended provisions enable the producer the right to sell his produce wherever he wants and even at his doorsteps. In these changing circumstances, it is felt that the need of the hour is to extend all marketing infrastructure at his door-steps by decentralizing the present system. Rural Shandies are the primary assembling centers, lack infrastructure facilities such as auction platforms, drinking water supply and roads around Platforms. These facilities need to be provided. It is suggested to invest Rs 1080.70 crore for development of marketing infrastructure in the state.

#### **4.2.7. Irrigation**

Irrigation plays pivotal role in improving the productivity and the production in the agriculture sector. The surface irrigation from tanks, barrages and lift irrigation schemes comes under the domain of minor irrigation department. It proposed to develop irrigation infrastructure under minor irrigation. The infrastructure development programmes suggested and the investment needed is indicated in Table 4.7.

##### **a). Rejuvenation of Tanks**

Surface irrigation from tanks, rivers is governed by minor irrigation department. Minor irrigation department look after tanks having more than 40 ha of command area, whereas, small tanks with an achkat less than 40 ha comes under the jurisdiction of Panchayaths. Due to lack of funds and neglect by the community, most of these community tanks have lost their storage capacity due to accumulation of silt, weeds and non-maintenance of bunds. It is proposed to rejuvenate these tanks during the next five years period. An investment of

Rs. 506.65 crore is suggested to rejuvenate the tank irrigation in the state during the perspective plan period.

**Table 4.7: Infrastructure Development and Investment Suggested For Irrigation Sector**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs. in crore)</b>
<b>Irrigation</b>	Rejuvenation of tanks,	506.65
	Bore well recharge	219.82
	Lift irrigation	206.97
	<b>Sub Total</b>	<b>933.44</b>

**b). Recharge of Bore-wells / open wells**

Open wells and bore wells are the major source of irrigation in the state. Many district receive scanty rains whereas, other districts receive more than 2000 mm per annum. However, most of the rain water is lost through run-off and the water table goes down during winter and summer months leading to shortage of water. To improve the water yield during winter and summer through ground water recharge, it is proposed to recharge these water sources by adopting suitable techniques. An investment of Rs. 219.82 crore is suggested in the five year perspective plan.

**c) Lift Irrigation**

It is proposed to expand irrigation facilities with the participation of community or beneficiary farmers. The total invest envisaged to development of lift irrigation facilities in the selected districts is estimated at Rs. 206.97 crore.

#### 4.2.8. Industries

It is proposed to develop processing industries based on the locally availability of raw material from agriculture, horticulture, fisheries and sericulture sectors. The infrastructure needs and expected investment is shown in Table 4. 8.

##### a). Establishment and Modernization of Small & Medium Agro-based Industries

It is proposed to develop small and medium agro industries in the district based on locally available raw material. For example, processing of Cashew, cashew shell oil extraction, coconut oil, desiccated coconut, cattle feed, poultry feed and condiments are the major agro based and food industries in the tiny and small scale sector. Ice blocks, fish processing, fish meal, fishnet manufacturing are also prominent industries supporting the fishing activities. Under medium/large scale Industries, printing, fishnet, etc are proposed for development. It is also envisaged to modernise the existing units by replacing old and obsolete technology. The total investment envisaged is Rs. 358.48 crore during the five year perspective plan.

**Table 4.8: Infrastructure Development and Investment Suggested For Agro Industries**

Sector	Infrastructure Component	Funds proposed (Rs. in crore)
Industries	Establishing of Small & Medium agro based industries	358.48
	Modernising present agro based industries	150.20
	Sub Total	508.68

#### 4.2.9. Other Institutions and investment in R & D

It is proposed to support research institutes/ organization like SAUs and others to modernize the research laboratories and other infrastructure facilities. Establish high tech seed processing facilities for KSSC, modernizing and expanding storage facilities, support to hand loom and power loom units, KVI, etc. An investment of Rs. 79.00 is suggested for the perspective plan period.

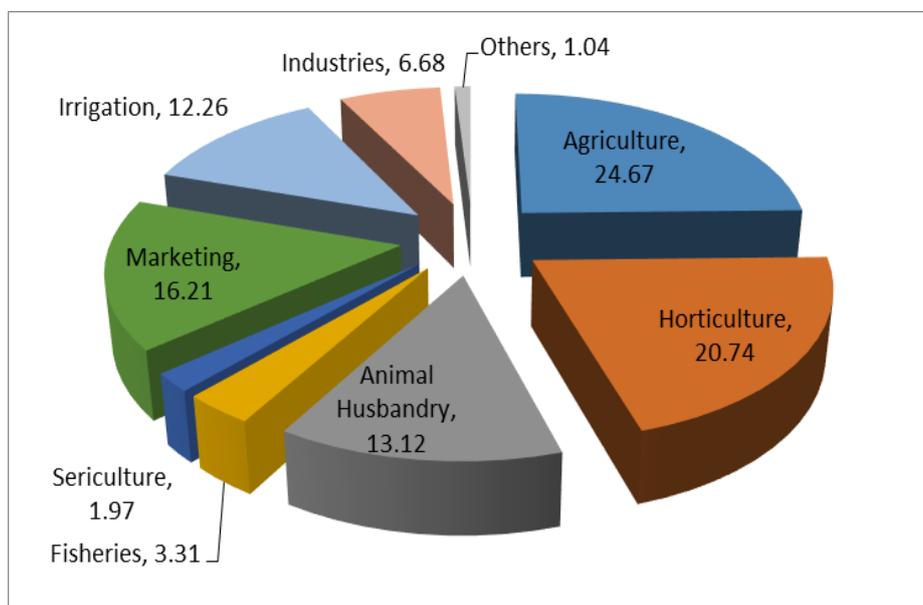
**Table 4.9: Infrastructure Development and Investment Suggested For Others**

<b>Sector</b>	<b>Infrastructure Component</b>	<b>Funds proposed (Rs. in crore)</b>
<b>Other Institutions</b>	High tech Seed Processing Units, Cold storage Units, Power looms, Water purifying plants	79.00
	<b>Total</b>	<b>79.00</b>

#### 4.2.10. Share of Different Sectors in the Total Investment

The total investment envisaged for development of infrastructure facilities in agriculture and allied sectors is estimated at Rs. 7613.54 crore during the perspective five year plan period. Development of infrastructure in agriculture sector accounts for nearly quarter of the proposed total investment, followed by horticulture sector (21 per cent) and marketing sector with 16 per cent as shown in the figure 4.1. The district wise investment for infrastructure are provided in Annexure III.

**Figure 4.1: Percentage Share of major Sectors in Proposed Investment**



**Sector wise funds proposed for infrastructure development for perspective plan period**

Rupees in crores

Sl.No.	Sector	Amount	% share
1	Agriculture	1878.12	24.67
2	Horticulture	1579.34	20.74
3	Animal Husbandry	999.07	13.12
4	Fisheries	<b>252.09</b>	3.31
5	Sericulture	<b>149.69</b>	1.97
6	Agriculture Marketing	1234.11	16.21
7	Irrigation	933.44	12.26
8	Industries	508.68	6.68
9	Other Institutions	79	1.04
	<b>Total</b>	<b>7613.54</b>	<b>100.00</b>

## *CHAPTER V*

### **SUMMARY AND CONCLUSIONS**

The Rashtreeya Krishi Vikasa Yojana (RKVY) guidelines were revised for providing funds to different States for 12th Five Year Plan period. Accordingly, the funding pattern was also modified to suit to the emerging needs of different States. After detailed deliberations, the revised RKVY guidelines were communicated to States for implementation.

The Government of India has specifically made it a mandate to submit Comprehensive District Agriculture Plans(C-DAPs), Comprehensive State Agriculture Plan and State Agricultural Infrastructure Development Plan before releasing funds to the States. During XII plan, emphasis is bestowed on Infrastructure development under RKVY. Infrastructure in agriculture sector helps in many ways so that the farmer can increase in his income.

The State Agriculture Infrastructure Development Plan (SAIDP) is prepared by integrating the components included in C-DAPs and also common infrastructure required at State level/two or more districts at a time. The

SAIDP, considers the development objective of achieving 4.5% growth in agriculture and allied sectors with focus on various infrastructure needed to achieve this level of growth. The plan will also include sector wise, year wise and district wise infrastructure needed to achieve the growth projections.

The proposed infrastructure, in each Sector/District was drawn from indicative and broader list of infrastructure for each sector provided by Govt. of India as per RKVY guidelines (Annexure I). It is expected that SAIDP will serve as a document to support C-SAP for the development of agriculture and allied sectors.

### **AGRICULTURE:**

Agriculture is the core sector of Karnataka, as 68 % of population depend on it for their livelihood and governs 15 % GDP. Agriculture is the profession of 90 % of rural population and 85 % rural households. Entire food requirement of the State depends on agricultural sector, including indirect availability of processed agricultural goods in the market.

Agriculture in Karnataka is dependent on rainfall at least in 66 % of its cultivated area. Hence, variations in rainfall decide the success of agriculture in the entire State. The remaining 34 % irrigated area is also indirectly dependent on rainfall. In this background, efficient utilization of rain-water, besides, irrigation water, is decisive in the success of agriculture in the State.

### **HORTICULTURE:**

It is the most important Sun-rise sector of Karnataka engaging nearly 23 lakh households of Karnataka and occupying about 20.2 lakh ha. of cultivated land with a production of about 171 lakh tons. Horticultural production keeps

the farmers engaged throughout the year by extended employment generation and is the source of income throughout the year as the production is spread over 8 – 10 months of the year. The horticultural crops, by virtue of their composition, are the sources of minerals, vitamins, fibre, anti-oxidants and fructose/sucrose, which are essential for health and to provide nutrition security of entire population. Horticultural crops are also of greater importance with respect to exports, as many fruits and flowers have higher export value as compared to agricultural crops.

The growth of horticultural production in Karnataka is governed by specific driving forces like availability of chain of cold storage, processing centres and market infrastructure as well as export demand for specific crops like grapes, mango, pomegranate. Fruits and spice crops are in great export demand, while vegetables are consumed domestically.

## **ANIMAL HUSBANDRY**

Principal activities of animal husbandry sector in Karnataka include dairying and poultry, whereas piggery is on minor scale. The State has 13 million dairy cattle (including buffaloes) and 53.4 million birds (broilers and layers). Dairying is principally carried as subsidiary activity of most agricultural farms by using household labour, whereas it is practiced as separate commercial enterprise as very limited number of independent business ventures.

In most situations, the farmers do not feed their indigenous cows with concentrates in dry period and feed insufficient concentrates even in milking period. Similarly, they are also deprived of green fodder in most situations. Most indigenous cows are not regular in conception and therefore, milking cycles are not regular.

Buffaloes thriving in hot dry climate, are popular dairy animals in northern districts. In most situations, stall feeding of buffaloes is not prevalent as they depend on grazing. However, they are stall fed with concentrates during milking period. Presently in Karnataka produces 61.23 lakh tons of milk from 12.99 million milch animals.

The poultry is not still regarded as an integrated farm component, although some instances of successful inclusion of poultry birds in farming systems are reported. Major poultry production in Karnataka is from independent commercial enterprises in and around urban settlements, obviously due to demand in urban areas.

The climate of Karnataka permits the birds to be reared without any extra care to provide heat in most districts, except Kodagu and hilly region of Uttara Kannada and Dakshina Kannada districts. However, extra lights are necessary in months from November to January to keep the birds warm & healthy.

Twin issues governing expansion of poultry production in Karnataka are market prices and feed prices. The cost of production depends mainly on feed prices and most farmers have thin margin between cost of production and returns due to higher feed cost. Poultry products are in adequate demand and farmers can produce plenty of poultry products, if these two issues are able to be monitored.

Presently Karnataka produces 4.41 million eggs and 1.81 lakh tons of broiler meat.

Karnataka State has 9.6 million sheep and 4.8 million goats. Due to their excellent fecundity, their population hasn't gone down despite increasing rate of their slaughter over years. Most of the meat sold and consumed in Karnataka is from sheep and goats. Very rarely they are treated as milch animals due to their poor milk yield. However, in recent years, goat milk is particularly more popular and sold at extra premium rate of Rs.60.00 to Rs.70.00/litre due to recently rediscovered medicinal values in it.

The demand for sheep meat is ever increasing due to changed food habits and spending norms both in urban and rural areas. Bulk quantity of meat is sold in cities due to concentrated human population and consistent demand for meat. In this perspective, the sheep and goat rearing profession has great scope in Karnataka.

Further, sheep rearing will be a very good activity in broad spaced horticultural crops such as mango and coconut. There is an acute necessity to introduce hygienic method of slaughtering the sheep and goat and equally hygienic method of processing and packing the meat for human consumption.

Presently, Karnataka has 88,500 ha under mulberry, producing 68759 tons of cocoons and as a result, value of raw silk works out to Rs. 2252.00 crores every years. There is scope to expand sericulture in all districts except coastal and hilly parts of Karnataka.

## **FISHERIES:**

Karnataka State produces 6.13 lakh tons of fishes every year. Out of this, major share (4 lakh tons) is from coastal districts i.e., Dakshina Kannada, Uttara Kannada and Udupi. All other districts have inland fishery units in the water bodies available with them. Among the interior districts with inland fisheries,

Davanagere, Shivamogga, Tumkuru, Hassan, Mandya, Ballari and Raichur districts have relatively higher fish production than other districts.

There are 602 fish markets in the State, with Bengaluru (132 Nos.) and Udupi (109 Nos.) having the major share. Kodagu district with very low fish production (3800 tons) has as many as 48 fish markets.

### **AGRICULTURE MARKETING:**

Marketing is the core sector influencing all other sectors. Specifically, agricultural marketing is most important as it has to handle 126 lakh tons of food crops, 10 lakh tons of oilseeds and 23 lakh tons of cotton. Every district has its own agricultural marketing arrangement mainly through APMC markets and sub-markets supported by godowns.

Marketing agricultural produce is an onerous task looking at the volume of produce. Facilitating the sale of agricultural produce needs larger investments on godowns, yards, scales etc., along with good roads. These infrastructure will decide the quality of service made available to farmers. In most districts, taluka places have sub-markets besides main markets in district place. The infrastructures required by all main and sub-markets require larger investments.

Karnataka State being a prime horticultural hub of the country, does not have exclusive markets for horticultural products, although the sector produces more than agricultural sector in terms of weight and value of the produce.

Marketing the produce from other sectors like sericulture, fisheries, animal husbandry and even horticulture do not reach regular APMC. They may have separate markets (cocoon markets, fish markets, KMF milk collection

centres, egg markets) not under the ambit of working of APMC. However, these markets also need to be strengthened on scientific lines to develop these sectors properly.

The future scenario of agriculture and allied sectors depend mainly on three factors:

- iv. Moisture:** Increasing irrigation facilities through area expansion and/or increasing irrigation efficiency through micro irrigation systems needs top priority. In rainfed ecosystem, every drop of rain water need to be conserved, stored and reused in critical stages of crop growth for enhancing crop productivity. Since, Karnataka has nearly 66% area under dry lands, all efforts to use rain water efficiently is the need of the hour. Krishi bhagya, a flag ship programme of Karnataka Government is being implemented by all departments in convergence to improve livelihood of dry land farmers.
- v. Mechanisation:** In view of large scale migration of rural population to urban areas in search of employment and livelihood, agriculture sector faces huge labour shortage to carry out field operations at the right time. More emphasis needed to be given on mechanisation. In this regard, efforts of state government in providing about Rs.500.00 crores for mechanisation is noteworthy. The novel scheme of 'Krishi Yantra Dhare' of Department of agriculture, wherein Custom Higher Service Centres (CHSCs) are planned to be established at Raitha Samparka Kendras (RSKs-769Nos.) at sub-block level. These centres will provide required farm machinery to farmers on rent basis, so that timely field operations can be taken up.
- vi. Market:** Market is another important sector which decides the fate of the farming community. Market includes primary processing,

storage (with cold chain facility), processing value addition, packing and finally sale of produce in the market with good marketing network.

Infrastructure are often defined as ‘basic facilities, services and installations needed for the functioning of a community’. They include all facilities and services to support the activity of a sector. They also include civil structures like buildings and roads as well as various installations facilitating communication, measurement, assessment, reorganisation, processing, conversion, value addition, packing and supervision. The infrastructure development will also include smooth and economically feasible delivery of services to effective functioning of a sector.

Agricultural infrastructure primarily includes wide range of public services that facilitate production, procurement, processing, preservation and trade. Agricultural infrastructure can be grouped under following broad based categories.

- **Input based infrastructure:** Seed, Fertilizer, Pesticides, Farm equipment and machinery etc.
- **Resource based infrastructure:** Water/irrigation, Farm power/energy
- **Physical infrastructure:** Road connectivity, Transport, storage, processing, preservation, etc
- **Institutional infrastructure:** Agricultural research, extension & education technology, information & communication services, financial services, marketing, etc.

Infrastructure are back-bone of development. No improvement of a sector or its activity can be achieved in absence of necessary infrastructure. In most situations, creation of basic infrastructure may be insufficient to derive full

services from such activities, unless regular allotment of budget is made to make them functional. Infrastructure should match with relevant technically competent manpower. A service is derived and utilized from an infrastructure only when it is managed well.

Agriculture and allied sectors in Karnataka have large number of infrastructure helping in production, storage and marketing of products of agriculture/allied sectors (Annexure II). Animal husbandry sector has maximum number of infrastructure as compared to other sectors, while irrigation sector is very poorly equipped with infrastructure. Sector-wise variation in infrastructure may be due to specific features of sector or may be due to poor development of such sector. But district-wise variation in infrastructure are invariably due to poor initiative taken by concerned implementing authority or due to poor allotment of funds. Instances are also available, where an existing infrastructure is poorly utilised and has not contributed to particular sector in significant way, due to shortage of manpower or paucity of funds to manage the facilities. Existing number of infrastructures are expected to be managed well and to be supported by new investment for additional infrastructure in the relative sector.

Lack of adequate infrastructure continues to constrain diversified agricultural growth in most places in India. Therefore, development of agriculture infrastructure should get priority in investment planning.

### **Infrastructure and Investment:**

The investment decisions for infrastructure development are based on felt needs of the all the stake holders. During the consultation process with farmers, researchers, officials of agriculture and allied sectors, it was discussed about the

need and utility of the investment and finally narrowed down to important once in each sector.

Infrastructure development in agriculture is lagging behind and needs to be developed so as to achieve accelerated and sustainable growth in long run. Productivity of the farm depends considerably on the availability of farm power and its efficient use. The States which have higher farm power availability per hectare show higher productivity. The Agricultural Mechanization is the only way out to face the challenge of farm workers' shortage.

Custom Hire Centres (CHSC) fits the bill. The farmers can hire the required machine/ equipment to complete the farm operations. These CHSC are equipped with all the major machinery and equipment like Tractor trolley, tractor, cultivators, rotovators, seed drills multi crop thresher, paddy transplanter, nursery media filling machine, reaper, post hole digger, planters, tree pruners, and power tiller driven equipments etc. An investment of Rs. 439.73 crore is suggested during the perspective five year plan.

Agro Processing Units with farmers and private participation would be established to minimize post harvest losses and maximize benefits from agricultural produce. “Agro Processing Units are to be established at district and taluk headquarters for different agriculture produce like pulses, maize, etc. An allocation of Rs. 180.70 crores is suggested for the years of the perspective plan.

Micro Irrigation System along with forward linkage of precision farming / front-end technologies, crop specific improved cultivation methods etc., to the

farmers of the State. It is suggested to provide 3 HP / 5 HP solar PV pumping system. Each pump will have a solar panel of 4800 Wp capacity and will deliver water equivalent to that of a 5 HP AC submersible pump set. It is suggested to invest Rs. 232.94 crore during the plan period.

Karnataka has given an important place for watershed development since 1980s. It has set up a separate watershed development department since 1996. Various watershed programmes are under implementation in the state and the district. The focus of this programme is to conserve soil and moisture and to put lands to the best use according to their capabilities to improve the overall productivity of the catchment holistically. A budget of Rs. 573.83 crore is suggested for the development of watershed in the state.

Fruits, exotic vegetables and flowers are high value low volume crops. The productivity as well as quality of the horticulture produce can be enhanced to get the premium price in the market. It is proposed to promote protected cultivation of horticulture crops under poly-houses and shed-nets under controlled conditions. A provision of Rs. 542.81 crore is suggested in the perspective plan to accomplish the task.

Horticulture produce is perishable in nature. It creates glut in the market during harvest season and depresses the prices. The processing of horticulture produce would not only facilitate value addition but also improve the shelf life of the product. It also helps in handling the final product. It is proposed to create new infrastructure facilities for processing of horticulture produce in the selected districts and modernize the existing facilities replacing the old and obsolete technology. An investment of Rs. 142.00 crore is suggested to create the required infrastructure.

Livestock production always acts as a buffer in case of crop failure. The infrastructure needs ascertained and proposed to develop are furnished. The meat markets in the district are unhygienic and animals are slaughtered in the open or in unhygienic places. It is proposed to establish modern high tech abattoirs in all the district with modern meat market. A budget for Rs. 298.85 crores is proposed to create the infrastructure facilities.

It is proposed to establish laboratories and disease diagnostic Centres with modern infrastructure facilities and up-grade and modernize the infrastructure a high tech training centre with disease diagnostic facility and vaccine production facilities at selected districts in the state. Disease diagnostic centre will save precious time for treatment of cattle in the district. An allocation of Rs. 63.00 crore is suggested in the budget for perspective plan period. It is proposed to increase the number of Mobile Veterinary Clinics so as to provide door to door emergency service for animals in the remote villages. It is proposed to invest Rs. 3.00 crore for expanding the number of mobile veterinary clinics in the state and strengthen infrastructure in the existing clinics. It is proposed to invest Rs. 3.00 crore.

Karnataka has potential to develop both inland fisheries due to presence of large number of irrigation tanks and reservoirs as well as marine fisheries as it has a long coast line. The lack of infrastructure facilities impedes the growth of fisheries in the state.

It is proposed to promote Integrated Composite Fish Culture Ponds wherein farmers grow mixed culture with Rohu, Katla, Mrugal and Common carp which feed at different levels / layers and do not compete with each other

for food. This helps in maximizing fish output from the unit area. The fishermen engaged in fishing sale their fish catch in rural shandies or at taluk markets. Even the fish catch from reservoirs has to be disposed off immediately due to lack of cold storage facilities. It is proposed to provide refrigerated vans for collection of fish catch and develop fish markets with cold storage facilities in all the taluk headquarters. A budget provision of Rs. 111.09 crores is suggested for creating infrastructure facilities during the perspective plan period.

The fish catch obtained by traditional boats is very low compared to mechanized boats and hence the income. It is proposed to assist fishermen operating traditional boats to modify their boats to motorized one. Similarly, provide financial assistance to buy modern fishing boats and nets for improving the fish catch. An allocation of Rs. 47.25 crore is suggested for the perspective plan period.

Mulberry cultivation and production of silk cocoon is being promoted to non-traditional areas in the state. However, markets for silk cocoon are very few. The sericulturists have to carry their produce to far away markets. Density of cocoon markets needs to be increased in the selected districts. Similarly, marketing infrastructure in the existing cocoon markets needs to be improved. The investment required for the development of cocoon markets and upgrading infrastructure is estimated at Rs. 25.00 crore.

Due to shortage in farm workers, farmers are not in a position to undertake various field operations in time. The Agricultural Mechanization is the only way out to face the challenge of farm workers' shortage. The educated

youth feel discouraged to work in farms due to human drudgery. The total investment for mechanization of sericulture is estimated at Rs. 19.75 crore.

Most of the reeling centres use filatures / manually operated machines for reeling silk. This more time consuming as well as arduous job. It is proposed to assist reelers to purchase reeling machines. The estimated investment required is estimated at Rs. 31.50 crore.

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It is proposed to rejuvenate these tanks during the next five years period. An investment of Rs. 506.65 crore is suggested to rejuvenate the tank irrigation in the state during the perspective plan period.

To improve the water yield during winter and summer through ground water recharge, it is proposed to recharge these water sources by adopting suitable techniques. An investment of Rs. 219.82 crore is suggested in the five year perspective plan.

It is proposed to develop small and medium agro industries in the district based on locally available raw material. It is also envisaged to modernise the existing units by replacing old and obsolete technology. The total investment envisaged is Rs. 358.48 crore during the five year perspective plan.

It is proposed to support research institutes/ organization like SAUs and others to modernize the research laboratories and other infrastructure facilities. Establish high tech seed processing facilities for KSSC, modernizing and expanding storage facilities, support to hand loom and power loom units, KVI, etc. An investment of Rs. 79.00 is suggested for the perspective plan period.