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**ROAD MAP FOR  
AGRICULTURE  
AND  
ALLIED SECTORS**

**GOVERNMENT OF BIHAR**

## INTRODUCTION

Bihar with a geographical area of about 94.2 thousand square km is divided by river Ganges into two parts, the north Bihar with an area of 53.3 thousand square km and the south Bihar having an area of 40.9 thousand square km. Based on soil characterization, rainfall, temperature and terrain, four main agro-climatic zones in Bihar have been identified. These are: Zone-I, North Alluvial Plain, Zone-II, north East Alluvial Plain, Zone-III A South East Alluvial Plain and Zone-III B, South West Alluvial Plain, each with its own unique prospects.

Though endowed with good soil, adequate rainfall and good ground water availability Bihar has not yet realized its full agricultural potential. Its agricultural productivity is one of the lowest in the country, leading to rural poverty, low nutrition and migration of labour.

The situation in other sectors is equally unsatisfactory. The yield gaps in fruits and vegetables are more than 300 %. As regards livestock, COMPFED, modeled after Amul is functioning well in certain areas, but overall livestock productivity is very low. There are yawning gaps in production and supply chain of meat and other byproducts of the livestock industry. As regards **poultry**, apart from backyard poultry production by the small farmer, commercial poultry has not yet taken off in the State.

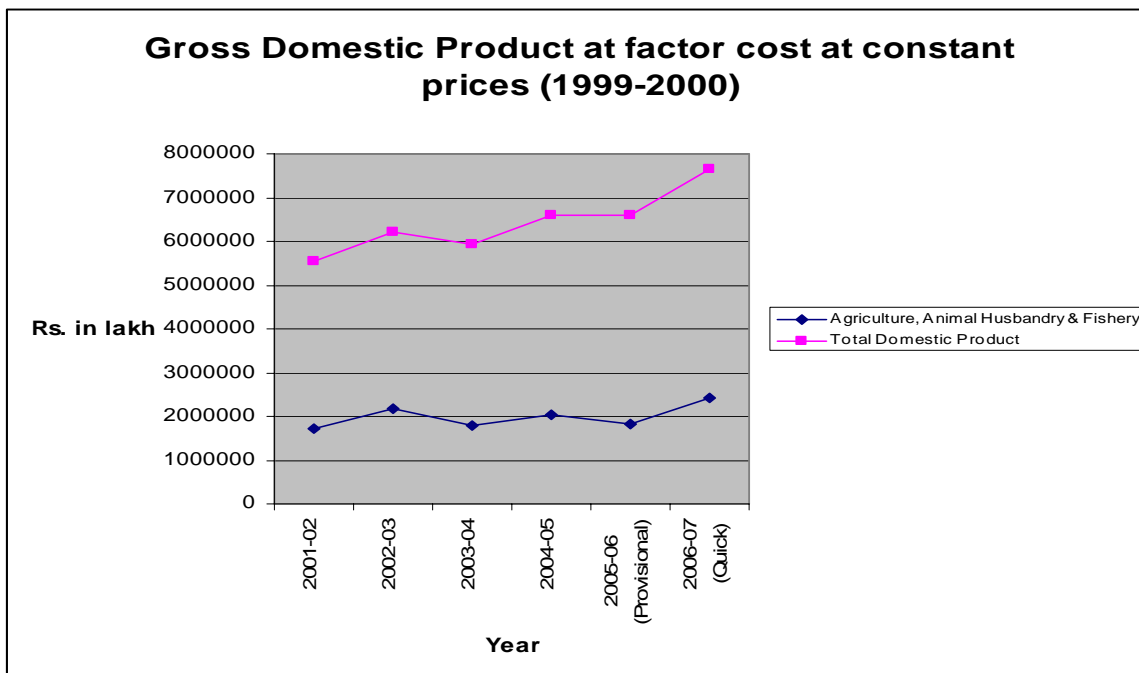
In spite of the abundance of water bodies, fisheries sector in Bihar does not fully meet the state's demand. It meets part of its fish requirement by importing fish from far away Andhra Pradesh. The fisheries industry in Bihar has not been able to utilize even a fraction of its potential. This road map is aimed to trigger processes of development in agriculture and allied sector.

**Rationale of Road Map:** Given the substantial yield gaps of most agricultural commodities on the one hand and low farmers' income and widespread rural poverty on the other, and also taking into account the richness of natural resources and high level of peoples' aspirations, a gradual approach for liberating the people of Bihar from twin traps of hunger and poverty will neither be economically sound nor socially expedient. In the context of national food security, it is worthwhile recalling words of prof. M.S. Swaminathan, from the report of National Commission on Farmers: "Unless

we develop this region into an agriculturally prosperous area, our country may have to revert to a ship-to-mouth existence once again after 40 years”.

**Goals:** With nine out of every ten persons from Bihar living in villages and with three out of four in Bihar employed in agriculture, a road map for agriculture is not about farming alone, but it is about lives of persons of the State. Primary objective of this programme of action is to provide income to majority of hungry people living in rural Bihar. The focus of this road map is on farmers rather than farms. A farmer is defined on the same lines as National Commission on Farmers, that is *“Farmers will refer to both men and women and include landless agricultural labourers, sharecroppers, tenants, small, marginal and sub-marginal cultivators, farmers with larger holdings, fishers, livestock and poultry rearers, pastoralists, small plantation farmers, as well as rural and tribal families engaged in a wide variety of farming related occupations such as apiculture, sericulture and vermiculture. The term will include tribal families sometimes engaged in shifting cultivation and in the collection and use of non-timber forest products. Farm and Home Science graduates earning their livelihoods from crop and animal husbandry, fisheries and agro-forestry will have their rightful place in the world of farmers and farming”*. In short, the proposed road map of agriculture, with defined goals and time frame gives a humanitarian dimension to agriculture apart from addressing the important question of food security.

Fluctuations of Bihar’s agricultural production and its impact on Gross State Domestic Product (GSDP) remains an area of concern. Problems of flood and drought severely affect the agricultural income on an annual basis. The following diagram shows that the contribution of agriculture and allied sectors, to GSDP and consequently GSDP itself fluctuating from year to year:



Source- Directorate of Statistics and Evaluation, GOB.

In the context of above discussion, **five major goals** of the road map on agriculture and allied sectors are:

- ❖ To ensure increase in income of farmers to viable levels, especially considering the small size of holdings.
- ❖ To ensure food security through increase productivity combined with profitability.
- ❖ To foster nutritional security through raising levels of productivity as well as raising living standards of rural societies.
- ❖ To revitalize farming in order to create gainful employment and to check migration.
- ❖ To ensure agricultural growth with justice, with programmes focusing on gender and human aspects.

A draft road map for agriculture and allied sectors was prepared and was presented in a meeting of farmers, numbering more than 2000 and drawn from all the

districts of Bihar held on 17<sup>th</sup> February, 2008 at Patna. The day long meeting, called the **Kisan Panchayat** was chaired by Sri Nitish Kumar, Chief Minister and cabinet ministers and senior-level officials and was attended by renowned agricultural scientists and other experts also deliberated on the draft road map. The draft road map was given final shape after considering various suggestions received during the Kisan Panchayat and is presented below.

# **ROAD MAP FOR AGRICULTURE DEVELOPMENT**

# 1. STRATEGIES FOR ACHIEVING GOALS SET FOR THE ROAD MAP

1.1 In order to achieve major objectives of increasing the farm income, while assuring food and nutritional security and enhancing agricultural growth with justice, a series of programmes are planned. These programmes cover all aspects of agriculture, from inputs to marketing of final products. They fall into four major groups:

- Inputs, access, supply and quality.
- Transfer of technology and extension.
- Income generation schemes.
- Marketing.

1.1.1 For the purposes of enhancing productivity 23 crops are selected for detailed attention during the duration of road map (2008-2012).

1.2 **INPUTS:** A major pillar of these programmes will be input management. Amongst inputs, seed is an important factor that contributes to productivity. Considering very low levels of seed replacement rate, it is proposed to implement a crash programme in introducing new varieties of seeds in the Bihar villages. This crash programme will be run by the farmer, for the farmer, taking up with government responsibility for reaching foundation seeds to the farmers. The road map visualizes a big peoples' seed movement building up in next four years.

1.2.1 Apart from this innovative seed programme, in a large number of villages, certified seeds will be produced through seed village programmes. Another strategy to enhance productivity will be to distribute substantial quantities of quality seeds at subsidized rates. The road map also visualizes fodder development through distribution of quality fodder seeds.

1.2.2 For producing these certified seeds, foundation seeds will have to be produced at government farms and university/KVKs. Schemes for infrastructural development of these farms are also a part of this road map. Substantial seed processing capacity is proposed to be created in Bihar Rajya Beej Nigam. Similarly, Bihar State Seed

Certification Agency will also be strengthened to meet certification requirement of a large number of farmers.

1.2.3 Horticulture holds the key for increased income, especially in case of small plots schemes. Similar to field crops, programmes are also planned for increasing availability of quality planting materials and vegetable seed production.

1.2.4 To boost production of potato seeds within the state, a special programme for potato seed production will be implemented. Similarly, for the expanding needs of sugarcane industry, a special seed distribution programme through sugar factories also forms part of this plan of action. Tissue culture laboratories for banana and sugar cane are also planned for meeting increasing demand.

1.2.5 Apart from seeds other major input is fertilizer. The road map recognizes the importance of chemical fertilizer in increasing productivity. But taking into account of lack of assured availability of these fertilizers, the road map proposes the State to play a more direct role in import of phosphatic and potassic fertilizers.

1.2.6 Taking note of constraints in supply of these fertilizers, the road map pushes for a massive programme for vermi-compost and green manures. The programmes are also designed ensure supply of boron, zinc, gypsum and pyrites at subsidized rates, wherever soil conditions so require.

1.2.7 Another crucial input is the pesticides. A programme for rejuvenating existing, plant protection centres forms a part of the road maps.

1.2.8 Apart from ensuring supply of inputs and their popularization, the road map also emphasizes quality aspects of the inputs. Soil testing laboratories will be constructed in all the blocks. At district level, the soil testing laboratories will also have seed testing wing. Apart from soil and seed testing laboratories, bio-control laboratories (for rearing natural defenders of crops), pesticide and fertilizer laboratories are also planned.

1.2.9 An important requirement for increasing productivity is to prepare fields quickly and to reduce time required between crop cycles. A massive farm mechanization programme, with emphasis on gender-friendly implements is planned.

**2. TRANSFER OF TECHNOLOGY AND EXTENSION:** In modern agriculture technology is a major input is transfer of agriculture technology at the grass-root

level, the road map proposes to establish 'schools', in farmer's fields. Farmers will be tutored on prescribed farming practices by trained personnel in their fields.

2.1 Demonstration of various technologies and exposure visits of farmers to other states would also be important components of transfer of technology.

2.2 The flagship scheme of agricultural extension of the state, the Kisan Samman Yojana, would be further strengthened with experiences learned in the past. At block level, use of I.T. in agriculture is proposed to be enhanced through establishment of e-kisan bhavans, which will also have soil-testing laboratories, farmer information centre etc.

3. **INCOME GENERATION SCHEMES:** This road map primarily aims to increase the income of the farmers, with this in view, integrated farming models prepared by ICAR and Rajendra Agriculture University are proposed to be implemented. The scheme is to maximize farm-income through convergence of schemes like dairy, fisheries, horticulture, poultry and duck rearing and crop husbandry ideally on a one-acre.

3.1 The road map also visualizes reclamation of degraded land through watershed development in districts of south Bihar.

4. **MARKETING:** A major programme visualized in the road map is integrated market development with a view that farmer get a better share of the ultimate consumer price. The market development programme visualizes Modern Terminal Markets at the top, agribusiness centres in the middle tier and rural hats at the bottom rung.

4.1 As a part of market program and with a view to enhance farm-income about 10,000 on farm primary processing centres, are also proposed on farmer's fields.

5. **CAPACITY BUILDING AND INSTITUTIONAL DEVELOPMENT:** The proposed programme of action calls for rejuvenation of extension machinery also. Therefore, revamping of Agriculture Department and capacity building of its personnel form an important part of the road map.

5.1 Similarly ambitious market infrastructure programme also calls for an institutional mechanism to oversee developmental activities and for asset management. By repealing Agriculture Produce Market Committee Act, Bihar has ushered in a new era of market reforms, which has no similar model elsewhere in the country. The road map recognizes that such a situation calls for a major programme of capacity building of both the farmers and governmental staff.

In the following pages, detailed planning of schemes relating to these sectors are presented, with physical milestones to be achieved at the end of the 11<sup>th</sup> Plan. Financing the road map for agriculture is also discussed.

## 2 SEED PLAN

2.1 Since seed is the delivery system through which almost all scientific advancements get transferred to the crop production scenario, availability of quality seed, is undisputedly a major factor for improvement of this sector. The present programme has been envisaged with the objective of introducing quality seeds of all major field and horticultural crops and sugarcane in a four years programme.

2.1.1 For this road map, a certain “thrust crops” are identified for intervention:

- Field Crops: Paddy, Wheat, Maize, Arhar, Gram, Lentil, Moong, Pea, Rapeseed/Mustard, Linseed, and Sugarcane.
- Horticultural Fruit Crops: Mango, litchi, Guava, Banana, Aonla
- Vegetables: Brinjal, Tomato, Okra, Onion, Pea, Potato and Drumstick

2.2 Field crops: Thrust of the programme would be not only to achieve self-sufficiency in seed production, but, to achieve so with quality seeds. Seed Replacement Rate (SRR) is a major indicator of the stage of growth of agriculture of a State. The Roadmap target to achieve in the next four years the following SRR: -

- Wheat and paddy : 35%
- Pulses: 20%
- Rapeseed / mustard: 55%, and
- Maize: 70%

This process has already been set in motion by reviving all the state agricultural farms, Bihar Rajya Beej Nigam and by strengthening Seed Certification Agency. The Roadmap proposes to implement a crash programme for saturating the State with quality seeds.

2.3 **Crash programme for field crops:** The present plan is prepared with the objective of introducing quality sees of identified field crops to each village of Bihar. Time-frame visualized a period of four years initially. The process would create sufficiency of quality seeds in the state, which would certainly make a paradigm shift towards enhanced productivity and production. This would contribute immensely in achieving economic prosperity and facilitate in attaining a robust economy in the country as a whole.

### 2.3.1 Strategies:

- New promising area-specific varieties for thrust crops have been identified.
- Breeder seed will be procured from ICAR/SAU Institutions.
- Foundation seeds will be produced on Seed multiplication farms.
- Processing and operating capacity of Bihar Rajya Beej Nigam will be increased.
- Seed Certification Agency will be strengthened to maintain the quality of seed with registration of 50,000 ha seed production area.
- A unique programme of horizontal transfer of (farmer to farmer) quality seeds will be implemented.

2.3.2 The Scheme: Two farmers in each village will be provided with specified quantity of foundation seed (seed material required for half acre in cereals and for quarter acre in pulses and oil seeds) at 50 % cost for seed multiplication. The produce will be transferred horizontally from farmer to farmer through traditional barter methods practiced in Bihar for such as sawai (one measure of seed for 1¼ measure of grain) dedha (one measure of seed for 1½ measure of grain) etc.

2.3.3 For this programme, an individual farmer is proposed to be given following quantities of foundation seeds. Annual seed requirements are also shown in the table below:

Sl. No.	Crop	Quantity of seed to be distributed /farmer (kg)	Annual Seed Requirement (in Qtls)
1	Wheat	20.0	18193.6
2	Rice	6.0	5458.1
3	Maize	4.0	1819.3
4	Arhar	2.0	1819.4
5	Gram	8.0	5404.0
6	Lentil	4.0	3189.4
7	Moong	3.0	1160.6
8	Rai/ Sarson/ Toria	1.0	454.8
9	Linseed	2.0	1562.2

2.3.4 This crash programme will, by itself, is expected to meet the seed requirement of the State. But, based on emerging requirements, seeds of new productive varieties with superior genetics may be availed from the rolling seed plan

(production of foundation seeds in the state farms), which would be operationalized concurrently.

2.3.5 The financial requirement for the crash programme is shown below:

(Rs. In Lakh)

Category of seed	2008-09	2009-10	2010-11	2011-12	Total
Breeder seed	70.855	80.784	90.212	100.340	342.191
Subsidy on foundation seed	707.970	707.970	707.970	707.970	2831.880
<b>Total</b>	<b>778.825</b>	<b>788.754</b>	<b>798.182</b>	<b>808.310</b>	<b>3174.071</b>

2.4 Foundation Seed Production in State Farms: Apart from production of foundation seeds for the crash programme mentioned above, foundation seed for the seed village scheme and for the certified seed production through farmers, will be produced in the rejuvenated state farms.

2.4.1 Breeder seed: Breeder seed will be procured from the ICAR/SAU institutions for the seed production programme.

2.4.2 Foundation seed production: breeder seed procured from the ICAR/SAU institutions will be multiplied into foundation seed at the seed multiplication farms.

2.4.3 The financial implications of the scheme is shown below:

(Rs. In Lakh)

Item	2008-09	2009-10	2010-11	2011-12	Total
Towards cost of breeder seed	60.00	60.00	60.00	60.00	240.00
Expenses for foundation seed production	630.00	630.00	630.00	630.00	2520.00
<b>Total</b>	<b>690.00</b>	<b>690.00</b>	<b>690.00</b>	<b>690.00</b>	<b>2760.00</b>

**2.5 Seed Village Programme:** In Seed Village programme, one seed village will be identified in each block in the beginning of crop season. The scheme proposes to achieve following objectives:

- Availability of good quality seed at local level and at reasonable price.
- Need based seed production will lead to the availability of improved seed of recommended varieties for the area.
- Seeds at relatively cheaper rate will decrease the cost of cultivation.
- Additional income by selling the seeds will attract other farmers towards seed production which will generate self employment.

2.5.1 Number of villages will be increased in the successive years to cover at least 5 percent of villages. ATMA will act as facilitator in proposed seed village by organizing training programme on quality seed production at KVK campus.

2.5.2 Proposed coverage of seed villages during the duration of road map will be as follows:

Sl. No.	2008-09	2009-10	2010-11	2011-12	Total
No. of seed village	538	1076	1614	2152	8070
Total area put under Seed production (ha) in Beej Gram	5380	10760	16140	21520	80700

2.5.3 The financial requirement for the programme is worked out as follows:

(Rs. In Lakh)

Year	2008-09	2009-10	2010-11	2011-12	Total
Financial requirements	165.00	306.00	514.00	774.00	1759.00

**2.6 Distribution of Quality Seeds:** To increase the Seed Replacement Rate, to improve the seed availability and to popularize the recently released varieties of the crop, the scope of ongoing scheme of subsidy on seed distribution is proposed to be enlarged substantially.

2.6.1 Presently subsidy element on the same crop seed varies from Government of India programme to programme and in some cases, from district to district. It is proposed to keep a uniform rate (the highest rate presently offered) for the same crop throughout the State.

Sl. No.	Name of the crop	Rate of subsidy (Rs./kg)
1.	Wheat	5.00
2.	Paddy	5.00
3.	Hybrid Paddy	20.00
4.	Pulses	12.00
5.	Oilseeds	12.00
6.	Maize	12.00

#### 2.6.2 Physical and Financial requirements:

Item/Years	2008-09	2009-10	2010-11	2011-12	Total
Physical target (In lakh qtls. for all crops)	6.00	6.50	7.00	7.50	27.00
Financial requirement (Rs. Lakh)	3700.00	4000.00	4300.00	4600.00	16600.00

**2.7 Strengthening Seed Infrastructure:** A massive seed programme envisaged here would entail substantial stepping up of processing and certification facilities. Towards this end, the following programmes will be taken up:

**2.7.1 Bihar Rajya Beej Nigam (BRBN):** A scheme for infrastructural development for processing, storage and its marketing. BRBN will be supported for establishment of seed processing plants and storage godowns at different places across the state.

**2.7.2 Bihar State Seed Certification Agency (BSSCA):** The Agency has the responsibility to ensure the quality standards of the seed produced within the State, and to realize that objective, BSSCA will be strengthened.

**2.7.3 Seed Multiplication Farms (S.M. Farms):** Seed Multiplication Farms have now been rejuvenated. Foundation seed requirement for the various seed production programme will be met by these S.M. farms. Therefore, they need to be equipped with all the necessary facilities required for successful seed production. As protective measure, construction of boundary walls of SMFs will be an important feature.

2.7.4 **Fully Mechanized Agricultural Farm (MAF):** Largest farm in the State, the Purnia farm, will be fully mechanized for large scale seed multiplication. It will also have demonstrative effect on the benefits of mechanization for seed production.

2.7.5 Financial requirements for:

Item/Years	2008-09	2009-10	2010-11	2011-12	Total
BRBN	500.00	500.00	500.00	-	1500.00
BSSCA	50.00	50.00	50.00	-	150.00
S.M. Farms	660.00	660.00	660.00	660.00	2640.00
MAF	100.00	-	-	-	100.00
<b>Total</b>	<b>1310.00</b>	<b>1210.00</b>	<b>1210.00</b>	<b>660.00</b>	<b>4390.00</b>

2.8 The seed plan aims at achieving major boost in seed production and to make the production an economically attractive proposition it is proposed to give support to marketing of the seed. The major initiative in seed marketing will however come from the private initiative.

2.9 To sum up, a major strategy for enhancing farm income proposed in the roadmap would be to make paradigm shift in use of seeds. Total financial requirement for seed plan of field crops is as under:

Name of the Programme /Years	2008-09	2009-10	2010-11	2011-12	Total
Crash Programme	778.825	788.754	798.182	808.310	3174.071
Production of Foundation seed in State farms	690.000	690.000	690.000	690.000	2760.000
Seed Village programme	165.000	306.000	514.000	774.000	1759.000
Distribution of quality seed	3700.000	4000.000	4300.000	4600.000	16600.000
Infrastructure development	1310.000	1210.000	1210.000	660.000	4390.000
<b>Total</b>	<b>6643.825</b>	<b>6994.754</b>	<b>7512.182</b>	<b>7532.310</b>	<b>28683.071</b>

### 3. HORTICULTURE: PLANTING MATERIALS

3.1 For enhancing employment opportunities and attaining food and nutritional security, Bihar holds a vast potential for growing large variety of horticultural crops especially fruit crops. Although it is one of the leading producers of litchi, mango, banana and guava in India, the area and productivity of these fruit crops was almost stagnant for many years, through in recent times the outlook is changing. The role of planting materials is very important in increasing production of a crop. For the fast development of horticulture adequate availability of quality planting materials of fruit crops need to be made available to the farmers.

3.2 **Fruit Crops** In the state of Bihar mango, litchi, guava and banana are major fruit crops and the roadmap would be focusing on these crops. During 2006-07, 17 progeny nurseries belonging to the State Government with quality mother plants had been revived giving a push to the production of planting materials.

3.2.1 **Objective:** To utilize waste and unproductive land by cultivating nutritious and remunerative fruit crops. Targets for new plantations are

- Mango: 15500 ha
- Litchi: 4500 ha
- Guava: 4500 ha
- Aonla: 4000 ha
- Banana: 10000 ha

3.2.2 The following table shows the crop and varieties selected for promotion:

Sl. No.	Name of the Fruit crop	Varieties identified
1.	Mango	Maldah, Bombai, Jardalu, Dashehari, Amrapali, Mallika
2.	Litchi	Shahi, China, Bedana, Rose scented
3.	Guava	A. Safeda, Sardar (L-49)
4.	Aonla	NA6/7, NA10
5.	Banana (Suckers & Tissue culture)	Dwarf Cavendish, G. Naine, Malbhog

3.2.3 For tree crops one farmer will get maximum number 400 saplings to establish 4 ha orchard and a minimum of 10 plants of one crop. For banana one farmer will get a maximum of 5000 saplings and a minimum of 500 saplings.

3.2.4 The coverage and subsidy norms would confirm to NHM guidelines for various food crops, wherever applicable.

3.2.5 One beneficiary can get saplings of more than one crop and more than one variety, if he has sufficient land of his own.

3.2.6 In case of degraded and wastelands, planting material at nominal cost (50% of cost) is proposed to be distributed.

3.2.7 Physical requirement of planting material is worked out as follows:

SI No.	Fruit Crop	No. of Saplings				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Mango	425000	425000	425000	425000	1700000
2.	Litchi	112500	112500	112500	112500	450000
3.	Guava	312750	312750	312750	312750	1251000
4.	Banana (Tissue culture + Suckers)	106.24	106.24	106.24	106.24	424.96
5.	Anola	156000	156000	156000	156000	624000
		<b>1006356</b>	<b>1006356</b>	<b>1006356</b>	<b>1006356</b>	<b>4025425</b>

3.2.8 Financial requirement for this programme would be :

SI No.	Fruit Crops	Financial Requirement (Rs. Lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Mango	171.250	171.250	171.250	171.250	685.000
2.	Litchi	28.125	28.125	28.125	28.125	112.500
3.	Guava	62.550	62.550	62.550	62.550	250.200
4.	Banana (Tissue culture + Suckers)	690.560	690.560	690.560	690.560	2762.240
5.	Anola	31.200	31.200	31.200	31.200	124.800
	<b>Total</b>	<b>983.685</b>	<b>983.685</b>	<b>983.685</b>	<b>983.685</b>	<b>3934.740</b>

**3.3 Vegetable Crop:** Following vegetable crops are identified for the purpose of this programme:

- Brinjal
- Tomato
- Okra
- Onion
- Pea
- Drumstick and
- Potato.

3.3.1 Strategy: Sixty percent of foundation seed will be produced in different departmental farms under Directorate of Horticulture and forty percent of foundation seed will be produced at RAU farms including KVKs .

3.3.2 The programme is similar to the crash programme in the field crops. Foundation seed at 50% cost will be made available to the farmers at the following quantities:

Sl. No.	Crop	Area to be sown (sqm)	Quantity of seed to be supplied (g)
1.	Brinjal	250	15
2.	Tomato	250	15
3.	Okra	250	250
4.	Onion	250	250
5.	Pea	250	3000

**3.4 Drumstick:** To popularize drumstick a limited number of rooted stocks proposed to be distributed free of cost to the farmers.

3.5 Physical and financial requirements for the above programme is

Vegetable Crop	Type of Seed	Seed requirement			
		2008-09	2009-10	2010-11	2011-12
Brinjal	Breeder	25.00 g	35.00 g	45.00 g	50.00 g
	Foundation	10.00 kg	13.50 kg	16.80 kg	20.00 kg
	Certified	40.35 q	53.80 q	672.00 q	80.70 q
Tomato	Breeder	85.00 g	115.00 g	150.00 g	170.00 g
	Foundation	7.00 kg	23.00 kg	29.00 kg	34.00 kg
	Certified	34.50 q	46.00 q	57.50 q	69.00 q
Okra	Breeder	13.18 q	18.00 q	21.96 q	26.36 q
	Foundation	105.45 q	140.00q	175.00 q	210.90 q
	Certified	845.60 q	1124.80 q	1406.00 q	1687.20 q
Onion	Breeder	8.00 kg	10.00 kg	13.00 kg	16.00 kg
	Foundation	8.00 q	10.00 q	125.00 q	16.00 q
	Certified	748.00 q	997.00 q	1246.00 q	1496.00q
Pea	Breeder	24.00 q	38.00 q	47.00 q	48.00 g
	Foundation	227.00 q	303.00 q	379.00 q	454.00 q
	Certified	1818.00 q	2425.00 q	3031.00 q	3636.00 q
Drumstick	Rooted plants to be distributed	27000	27000	2700	27000
<b>Total financial Requirement (Rs. lakh)</b>		<b>141.09</b>	<b>186.04</b>	<b>239.43</b>	<b>280.57</b>

3.6 **Potato:** Breeder Seed (B/S) will be made available from the Central Potato Research Institutes, ICAR.

3.6.1 Foundation Seed Stage I (F/S I) will be produced in 38 KVK's under RAU, Bihar, Pusa, Samastipur and Department of Agriculture in different farms. Total land available under RAU and Department of Agriculture farm will be about 250 ha, in which 150 ha will be provided by RAU and 100 ha. will be made available by Department of Agriculture, Govt. of Bihar.

3.6.2 For production of Foundation Seed Stage II (F/S II) and certified seed it is proposed that progressive farmers, farmer Co-operatives and the potential agencies should be entrusted.

3.6.3 For multiplication as certified seed, a farmer will be received 5 quintals of foundation seed for 0.5 acre area at 50% cost:

#### 3.6.4 Physical and financial requirement

Vegetable Crop	Type of Seed	Seed requirement (In tons)			
		2008-09	2009-10	2010-11	2011-12
Potato	F/S-II	15625	15625	15625	15625
	F/S-I	3125	3125	3125	3125
	B/S	625	625	625	625
<b>Financial Requirement (Rs. lakh)</b>		<b>499.375</b>	<b>547.500</b>	<b>598.125</b>	<b>653.750</b>

3.7 Sugarcane: In case of sugarcane, seed is to be supplied by the sugar factories from their farms. Promising varieties grown in 12 districts of Bihar are CoP 9301, CoS 96268, CoS 767, BO 139, UP 9530 and BO 147. If the seed is to be procured from other agencies, the indent of seed will be submitted by the concerned sugar factories to the seed supplying agencies by end of August each year with information to Cane Industry Department and S.R.I., Pusa. Factory will provide the list of villages and name of the farmers to the Cane Industry Department by the end of July each year along with variety wise seed requirement and source of availability. The cost of seed alongwith transportation cost will be paid by Cane Industry Department to the concerned sugar factories.

3.7.1 Factory wise seed requirement for factories in Bihar is worked out as follows

(in quintals)

Sl. No.	Name of the Factory	Total no. of villages	Seed requirement (in Qtls)
1.	Bagaha	261	9396
2.	Harinagar	369	13284
3.	Narkatiaganj	436	15696
4.	Majhulia	359	12984
5.	Sidhwalia	536	19296
6.	Gopalganj	1935	62460
7.	Sasmusa	422	15192
8.	Hasanpur	484	17424
9.	Riga	835	30060
	<b>Total</b>	<b>5637</b>	<b>195792</b>

### 3.7.2 Financial requirement

SI No.	Items	Financial Requirement (Rs. lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Seed @ Rs 150 q	293.70	293.70	293.70	293.70	1174.80
2.	Transportation & Distribution @ Rs. 100@Qtl	195.80	195.80	195.80	195.80	783.20
3.	Input cost @ Rs. 3000/ farmers	978.66	978.66	978.66	978.66	3914.64
4.	Preparation of leaflets	2.50	2.50	2.50	2.50	10.00
5.	Misc Items	5.00	5.00	5.00	5.00	20.00
	<b>Total</b>	<b>1475.66</b>	<b>1475.66</b>	<b>1475.66</b>	<b>1475.66</b>	<b>5902.64</b>

**3.8 Tissue Culture Laboratory:** Tissue Culture plants revolutionized Banana cultivation in India and across the world. Considering the demand, banana and sugarcane are proposed to be multiplied through tissue culture.

3.8.1 Four tissue culture laboratories are proposed to be established in next four years in University/KVK/ Department or in PPP mode. The capacity of this laboratory will be five lakh plants per year. The total establishment cost of one laboratory will be 150 lakh. Accordingly one laboratory per year will be established with total cost of Rs.600 lakh.

3.8.2 Financial requirement:

Item/Year	2008-09	2009-10	2010-11	2011-12	Total
Tissue culture laboratory	150.00	150.00	150.00	150.00	600.00

### 3.9 Summary of the financial requirement

Sl. No.	Name of programme	Financial requirement (Rs. Lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Crash Programme for field crop	778.825	788.754	798.182	808.310	3174.071
2.	Rolling seed plan	690.000	690.000	690.000	690.000	2760.000
3.	Seed Village programme	165.000	306.000	514.000	774.000	1759.000
4.	Distribution of quality seeds	3700.000	4000.000	4300.000	4600.000	16600.000
5.	Strengthening of seed infrastructure	1310.000	1210.000	1210.000	660.000	4390.000
6.	Planting material for fruit crops	983.685	983.685	983.685	983.685	3934.740
7.	Quality seed of Vegetable crops	141.090	186.040	239.430	280.570	847.130
8.	Potato	499.375	547.500	598.125	653.750	2298.750
9.	Sugarcane	1475.660	1475.660	1475.660	1475.660	5902.640
10.	Tissue culture laboratory	150.000	150.000	150.000	150.000	600.000
	Grand total	9893.635	10337.639	10959.082	11075.975	42266.331

## 4. SOIL HEALTH MANAGEMENT

4.1 The objective of any soil health management programme is to sustain crop production while maintaining soil conditions. The future lies in harmonious use of nutrients through organic and biological sources. The main issues in soil health management in Bihar are:

- Continuous use of fertilizer N and/alone or with inadequate P and K application leading to mining of native soil P and K and distortion in the N:P:K ratio.
- Continued practice of intensive cropping system like rice-wheat with high yielding varieties even under recommended N:P:K use, impoverishing soils of micronutrients.
- Use of high analysis fertilizer and inadequate addition of organic manures resulting in wide spread deficiencies of micronutrients.
- Fertilizer application mostly not based on soil-test values.
- Inadequate availability of appropriate kind of fertilizers at the right time.
- Low status of soil organic carbon.

4.2 This Road map tries to address the above problems through series of policy initiatives and programmes. The strategies are:

- To attain N:P:K ratio of 4:2:1.
- To promote integrated nutrient management.
- To enhance the soil productivity.
- To improve the physical condition of soil.
- To increase fertilizer use efficiency.
- To promote application of balanced nutrients on the basis of soil test to achieve targeted yield.

4.3 **Supply of Fertilizer:** One of the major constituent for high production of crops is fertilizer management. To achieve the desire level of productivity the scientifically recommended dose of N:P:K at a ratio of 4:2:1 should be maintained. The fertilizer

consumption in Bihar had registered impressive growth in the last two years, as can be seen in the table below.

Consumption of fertilizer in last three years.

(quantity-in M.T.)

Year	Urea	DAP	NPK	MOP	SSP	Total
2005-06	1381269	178543	146131	130644	35327	1871914
2006-07	1598043	263445	166451	90382	26796	2145117
2007-08 (Estimated)	1800000	325000	200000	120000	60000	2505000

4.3.1 In line with the objectives of the road map to increase productivity through quality inputs of seed etc., the consumption of fertilizer is projected to increase substantially.

Table: Projection of Fertilizer Consumption in the next 5 years

(Quantity in M.T.)

Year	Urea	DAP	NPK	MOP	SSP	Total
2008-09	1890000	350000	225000	130000	65000	2660000
2009-10	2050000	400000	250000	140000	70000	2910000
2010-11	2150000	430000	270000	151000	76000	3077000
2011-12	2350000	500000	290000	163000	82000	3385000

4.4 With increased prices of naphtha and ammonia in the international market, scarcity of phosphatic and potassic fertilizer was acutely felt in the last two seasons. The reasons are, that the fertilizer companies had withdrawn from supplying of imported phosphatic and potassic fertilizers on their own. Government of India had asked the State Governments to directly import the fertilizers.

4.4.1 The situation calls for identification of an agency to import and supply phosphatic and potassic fertilizer in order to maintain steady supply of fertilizers. Further, the State Government will have to bear the cost of storage, handling, transport and other charges incidental to fertilizer trade.

#### 4.4.2 Financial statement

Year	Overhead/transportation etc. (Rs. Lakh)
2008-09	1500.00
2009-10	1000.00
2010-11	1000.00
2011-12	1000.00
<b>Total</b>	<b>4500.00</b>

4.5 Vermi/NADEP Compost: Overuse of chemical fertilizers is stagnating food production in developed states like Punjab. Keeping in mind, the harmful use of chemical fertilizer, an ambitious bio-fertilizer programme is visualized through vermin and NADEP compost. Vermicompost, apart from supplying nutrients and growth enhancing hormones to plants, improves the soil structure leading to increase in water and nutrient holding capacities of soil. NADEP compost are relatively bulky materials such as animal and plant wastes added to soil mainly to improve the physical condition to replenish its humus content, to maintain optimum condition for microbial activity and make good a small part of the plant nutrients removed by crop or lost through leaching or soil erosion.

4.5.1 A scheme of subsidizing vermin compost production in the State is already being implemented. It is proposed to substantially increase the coverage.

#### 4.5.2 Physical and financial requirement:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Physical (No.)	12000	18000	24000	24000	48000
Financial requirement (Rs. Lakh)	3600.00	5400.00	7200.00	7200.00	23400.00

**4.6 Integrated Nutrient Management:** To add and revive the soil fertility of the farm application of bio- fertilizer is required. Bio-fertilizers i.e. Blue- Green algae & azolla in the Rice and azotobacter, PSB, VAM, green manuring etc. may be promoted among the farmers on subsidy @ Rs. 500.00/hectare.

4.6.1 Physical and financial requirement:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Physical (area in lakh ha.)	1.00	2.00	3.00	4.00	10.00
Financial requirement (Rs. Lakh)	500.00	1000.00	1500.00	2000.00	5000.00

**4.7 Distribution of micronutrients:** To replenish the deficiency of soil micronutrients namely Zinc, boron etc. an assistance @ 50% of the cost of the micronutrients (maximum Rs. 500.00 /hect.) is proposed to be given to the farmers.

4.7.1 Physical and financial requirement:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Physical (area in lakh ha.)	2.00	3.00	4.00	5.00	14.00
Fund (Rs. Lakh)	1000.00	1500.00	2000.00	2500.00	7000.00

**4.8 Application of Gypsum/Pyrites:** Soil survey done by Rajendra Agriculture University, Pusa has identified 24 districts having soil with alkaline reaction and 3 districts having acidic reaction. Farmers of these districts will be incentivised to use gypsum and pyrites to correct the soil reaction and physical condition of the soil. Farmers will be extended an assistance @ Rs. 500/hac.

4.8.1 Physical and financial requirement:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Physical (area in lakh ha.)	2.00	3.00	3.50	4.00	12.50
Financial requirement (Rs. Lakh)	1000.00	1500.00	1750.00	2000.00	6250.00

4.9 Total Fund requirement for soil health management is as follows:

Sl. No.	Name of programme	Financial requirement (Rs. Lakh)				
		2008-09	2009-10	2010-211	2011-12	Total
1.	Overhead cost for imported fertilizers	1500.000	1000.000	1000.000	1000.000	4500.000
2.	Vermi/NADEP compost	3600.000	5400.000	7200.000	7200.000	23400.000
3.	Integrated Nutrient Management	500.000	1000.000	1500.000	2000.000	5000.000
4.	Distribution of Micro-nutrient	1000.000	1500.000	2000.000	2500.000	7000.000
5.	Application of Gypsum/pyrites	1000.000	1500.000	1750.000	2000.000	6250.000
	Grand total	7600.000	10400.000	13450.000	14700.000	46150.000

## 5 CROP PROTECTION

5.1 Crop losses due to insect-pests and diseases considerably reduce the farm income. It is essential to evolve methods and techniques to protect the crop losses that are suitable to the environment and are easily accessible. The experiences gained during last decades, expert committees have evolved methodology in crop protection, popularly known as IPM (Integrated Pest Management).

5.1.2 **Integrated Pest Management** is a technique of crop-protection, which is intended to make awareness among the farmers at large, regarding the crop-field environment and harmful effects of injudicious use of chemical pesticides. This technique is mainly constituted with following practices integrating all the components on Farmers Field Schools (FFS). The FFS model of extension is discussed later. The other elements of IPM are:

5.2 **Operationalization of Plant Protection Centres:** At present the P.P. centres numbering 324 are not functioning and it is proposed to operationalize them through PPP mode. Further there is a need for covering all the blocks of the State. The centre will be run on services chargeable from the farmers on reasonable rate of plant protection measures and timely availability of P.P. machines for its application. These centres will also be used for distributing bio-origin pesticides at subsidized rates to farmers.

5.2.1 Financial requirement to meet capital and running cost expenditure of these centres is estimated at:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Financial requirement (Rs. Lakh)	200.00	150.00	150.00	150.00	650.00

5.3 **Strengthening of soil health Infrastructure: Soil testing Laboratory:** Soil analysis of the farmer's field is the most important tool for making a micro-farm plan. The knowledge of pH, E.C., availability of essential nutrients, water holding capacity etc. of the soil helps to application of judicious use of fertilizer, bio- fertilizer, soil amendment etc. which ultimately give the maximum return on per unit cost of basic inputs.

### 5.3.1 Physical and financial requirements:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Soil testing lab. At block level (in number)	166	165	165		496
Establishment cost (Rs. Lakh)	2490.00	2475.00	2475.00		7440.00
Recurring expenditure (Rs. Lakh)	453.75	453.75	453.75	453.75	1815.00
Financial requirement (Rs. Lakh)	2943.75	2928.75	2928.75	453.75	9255.00

5.4 **Bio-control laboratory:** Natural defenders of the pest, the friendly insects and organisms, are reared at these labs. They will be disseminated timely in the field to create a favourable bio-environment.

### 5.4.1 Physical and financial requirements:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
Bio- control lab	3	3			6
Financial requirement (Rs. Lakh)	240.00	240.00	-		480.00

5.5 **Phyto-sanitary laboratory:** Export of goods of agriculture produce needs Phyto-sanitized. Existing Phyto-sanitary Lab are proposed to be further strengthened.

5.5.1 Fund required for the Phyto-sanitary Labs in 2008-09 - Rs 50.00 Lakh.

5.6 **Quality Control Laboratories:** Fertilizer and pesticide are the important inputs for sustainable agriculture. Approximately 22 lakh MT inorganic fertilizer and 950 MT of chemical pesticides are consumed every year through the dealer network of approximately 10,000 outlets in the state of Bihar. Apart from these, consumption of organic and bio-fertilizer as well as bio-pesticide is also becoming very popular.

5.6.1 To ensure good quality availability of fertilizer and pesticide there is a need to establish three new fertilizer cum pesticide testing laboratories, one bio-pesticide testing lab and strengthening of existing State level fertilizer and pesticide quality control lab. Presently the analysis capacity of State level quality control laboratory is about 2500 samples per annum, which is proposed to increase up to 4500 samples per annum.

5.7 Financial requirement for upgradation and establishment of above mentioned labs are given below:

Year	2008-09	2009-10	2010-11	2011-12	Total
Financial requirement (Rs. Lakh)	418.28	464.44	162.59	74.80	1120.11

5.8 Total fund requirement for various activities under crop protection is given below:

Sl. No.	Name of programme	Financial requirement (Rs. Lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Operationalization of P. P. centre	200.00	150.00	150.00	150.00	650.00
2.	Soil testing laboratory	2943.75	2928.75	2928.75	453.75	9255.00
3.	Bio-control laboratory	240.00	240.00			480.00
4.	Phyto- sanitary laboratory	50.00				50.00
5.	Quality control laboratory	418.28	464.44	162.59	74.80	1120.11
	Grand total	3852.03	3783.19	3241.34	678.55	11555.11

## 6. FARM MECHANIZATION

6.1 Agriculture Mechanization is a means to introduce improved implements and machines for different agricultural practices to increase productivity. Mechanization helps in timely land preparation, timely sowing and timely harvesting of crops. Use of improved implements for land preparation reduces cost and time. This is important in the Bihar context, where productivity is affected by late sowing of cereals.

6.2 In order to promote farm mechanization this road map proposes for distribution of farm implements on subsidized cost. It is proposed to give 50% subsidy on power tiller, zero till machine, rotavator, combine harvester, paddy transplanter, conoweeder, reaper, sugarcane cutter planter, land leveller and other modern and improved implements. For tractor and some specified instrument subsidy will be 25%. Emphasis will be given on gender friendly equipments.

6.3 Agricultural implements workshop were established at Patna, Ara, Purnea, Muzaffarpur for repair of farm implements and also for the training of the extension officers. Now these workshops are in a dilapidated condition. These workshops need to be renovated. The renovation work will involve repair of building infrastructure and purchase of new equipment.

6.4 The financial requirement for farm mechanization given below: (Rs in lakh)

Sl. No.	Component	Year				Total
		2008-09	2009-10	2010-11	2011-12	
1.	Subsidy on implements	7800.00	8800.00	9000.00	10000.00	35600.00
2.	Renovation of workshop	50.00	50.00	-	-	100.00
2A.	Purchase of Implements for workshops	70.00	70.00			140.00
	Total	7920.00	8920.00	9000.00	10000.00	35840.00

## 7. TRANSFER OF TECHNOLOGY

7.1 Technology is a critical input in modern agriculture. This road map visualizes not to exclude any farmer from modern agriculture technology. Following measure would be used for transfer of technology, through ATMA platform.

7.2 **Farmers' Field School:** For an effective transfer of technical informations from scientific laboratories of ICAR/ RAU to farmers filed different stakeholders including farmers would be extensively involved. For this farmer to farmer technology transfer for would be emphasized. Farmers field school in the agriculture plot of farmers achievers would be carried out on large scale.

7.2.1 Farmers' Field School will be the most important medium of extension for the purposes of this road map. For one day a week, continuously for 20 weeks (20 days) 30 farmers drawn from catchments of 1000 ha. will be trained in cropping practices in a farm chosen for this purpose. Full coverage of the state with Farmers' Field School is expected to be achieved by 2011-12. Cost norms for a single Farmers' Field School is kept at Rs. 17000.

7.3 **Demonstration:** Traditionally demonstration has effectively been used for transfer of crop production technology to the farmers. Crop demonstration is based on the principal "seeing is believing" wherein farmers test the modern technology in their own field and later on adopt it. Large scale demonstration will be conducted in farmers' field on important crop production technology, integrated nutrient management, hybrid rice, SRI technology. Rs. 2000 per ha incentive will be provided to the farmers for conduct of demonstration. The cost norm for the hybrid rice demonstration will be Rs 3000 per ha.

7.4 **Farmers' Training and Exposure Visit:** Farmer scientist interaction for direct interface between farmers and scientists farmers training will be conducted in KVKs and also at the block and village level. For each farmers training Rs 5000 will be provided. Farmer's exposure visit to centres of excellence would be conducted to create awareness among the farmers. A group of 20 farmers will be taken to agriculture research institute / national/ international centers for which Rs 50000 per batch will be provided the cost will cover to and fro journey including the incidental cost.

7.5 **Award to progressive farmers:** Progressive farmers who have achieved distinctive successes in agriculture will be honoured so that the peer farmers emulate him and he feels encouraged to adopt farming his full time profession. Under “Kisan Samman Yojna” best farmer at block level will be honoured with “Kisan Sri” and a cash award of Rs. 1 lakh, at district level best farmer will be honoured with “Kisan Bhusan” and a cash prize of Rs 2.00 lakh. At the state level best farmer will be honoured with “Kisan Ratna” and a cash award of Rs. 5.00 lakh.

7.6 **Officers’ training at Rajendra Agriculture University:** To update the technical knowledge of the extension workers capacity building of extension functionaries would be emphasized. Rajendra Agriculture University would mandatorily conduct training for extension officers before start of each crop season.

7.6.1 Similarly it is planned to use facilitators for various training programmes and field schools. For a two day module, Rs. 1000 per trainee is taken as cost norm.

7.7 The physical programme for transfer of technology’s given below:

SI No.	Component	Year				Total
		2008-09	2009-10	2010-11	2011-12	
1.	Farmers filed school	2000	3000	4000	5000	14000
2.	Farmers training on Crop production	4000	6000	8000	8471	26471
2.A	Farmers training on Farm mechanization	2000	2000	2000	2000	8000
3.	Demonstration on					
3A	Seed Production technology	6000	8000	10000	10000	40000
3 B	Integrated Nutrient Management	8471	8471	8471	8471	33884
3 C.	Demonstration on Crop Production	16942	25413	33884	42355	118594
3 D.	Demonstration on SRI	3000	3000	3000	3000	12000
3 E	Demonstration on Hybrid Rice	10000	10000	10000	10000	40000
4.	Exposure Visit	1000	1200	1400	1600	5200
5.	Officers Training	200	200	300	300	1000
5 A.	Training of facilitators	800	1000	1200	1200	4200
6	Kisan Samman Yojna	577	577	577	577	2308
	Total	71645	82307	93178	102204	349334

7.8 The financial requirement for transfer of technology's given below: (Rs in lakh)

Sl No.	Component	Year				Total
		2008-09	2009-10	2010-11	2011-12	
1.	Farmers field school	1160.25	1160.25	1160.25	1160.25	4641.00
2.	Farmers training on crop production	200.00	300.00	400.00	423.55	1323.55
2A	Farmers training on Farm mechanization	100.00	100.00	100.00	100.00	400.00
3.	Demonstration on					
3A	Seed Production technology	250.00	250.00	250.00	250.00	1000.00
3 B	Integrated Nutrient Management	423.55	423.55	423.55	423.55	1694.20
3 C.	Demonstration on Crop Production	338.84	508.26	677.68	847.10	2371.88
3 D.	Demonstration on SRI	60.00	60.00	60.00	60.00	240.00
3 E	Demonstration on Hybrid Rice	250.00	250.00	250.00	250.00	1000.00
4.	Exposure Visit	500.00	600.00	700.00	800.00	2600.00
5.	Officers Training	2.00	2.00	3.00	3.00	10.00
5A.	Training of facilitators	8.00	10.00	12.00	12.00	42.00
6	Kisan Samman Yojna	619.00	619.00	619.00	619.00	2476.00
	Total	3911.64	4283.06	4655.48	4948.45	17798.63

## 8. AGRICULTURE EXTENSION

8.1 This road map for agriculture with time-bound targets would require an efficient administrative delivery system. Unfortunately over the last two decades, the village level agricultural extension machinery has almost withered away or are deployed elsewhere in rural construction works, PRI management etc.

8.2 **Panchayat Level Presence:** To rejuvenate the Agriculture Department it is essential to have its own set up for management and execution of agriculture programmes. Taking into account the population of farmers, for effective extension work, should be deployed at Panchayat level. Designated as Panchayat Agriculture officer, he or she who would work directly under the Block Agriculture Officer.

8.3 **Block Level:** To execute the different programmes effectively an establishment of separate Block Agriculture Development Officer along with subordinate Agriculture officers depending on the no of Panchayats in the Block to be set up.

8.4 All Block Agriculture Development officers will operate under the direct control of the District Agriculture officers. District Agriculture officer in the district should be assisted by expert officers in different fields. Restructuring of agriculture department to meet the growing needs of the farmers of the state would be studied and carried out with in next 9 months.

8.5 As short-term measures, to meet the personnel needs of extension work para-extension workers will be deployed through ATMA. An honorarium of Rs. 5000 per month is proposed to be given to these workers.

### 8.5.1 Financial Implications for para extension workers:

Items/Year	2008-09	2009-10	Total
Financial requirement (Rs. Lakh)	5082.60	5082.60	10165.20

8.6 e-Kisan Bhawan: For each block headquarters, a Kisan Bhawan is visualized that would work as

- (a) Farmer Information and advisory Centre.
- (b) Soil testing lab
- (c) Training centre.
- (d) Dormitory for farmers
- (e) Plant protection centre.
- (f) I.T. and market intelligence centre.
- (g) Agriculture Machinery bank for custom-hiring.
- (h) Weather information
- (i) Administration wing (BADO's ) office.

8.6.1 Each centre would have a genset and would have internet connection. These e-Kisan" bhawan would be a part of larger I.T. network of the Agriculture Department and farmers would have access to weather and other information on real time basis.

8.6.2 Part of the services of these centres would be through PPP mode and part directly financed. Rs. 25 Lakh per centre is proposed to be the capital expenditure.

### 8.6.3 Physical Implications

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
E-Kisan Bhawan (in number)	166	165	165		496

### 8.6.4 Financial Implications:

Items/Year	2008-09	2009-10	2010-11	2011-12	Total
E-Kisan Bhawan (Rs. lakh)	4843.50	4125.00	4125.00		13093.50

## 9. INTEGRATED FARMING MODEL

- 9.1 Indian Council of Agricultural Research has developed a one acre model of Integrated Farming Model which on adoption ensures higher income to farmers. This model is based on farming system approach which incorporates different enterprises viz. crop production, animal rearing and fisheries.
- 9.2 Integrated Farming ensures optimal utilization of resources as the waste of one enterprise becomes a useful input for the other enterprise. Therefore the cattle dung is used as the fertilizing material for fish pond and for the crop production.
- 9.3 Bihar agriculture which is predominantly small farm agriculture offers huge promise for increasing the income of farmers.
- 9.4 In order to popularize the model it is proposed to incentives farmers for its adoption. For one acre a support of Rs. 3000 is proposed under this road map.
- 9.5 Physical and financial programme is outlined below:

(Rs. In lakh)

Sl. No.	Item	2008-09	2009-10	2010-11	2011-2012	Total
1.	Area under Integrated farming(Acres)	25000	50000	100000	150000	325000
2.	Financial requirement	75.00	150.00	300.00	450.00	975.00

## **10. SOIL & WATER CONSERVATION ACTIVITIES IN RAINFED AREAS**

10.1 There is undulated topography in the foot hills of sub plateau region spreading from Banka district to Kaimur district in the south of Ganges. Rainfed agriculture is complex, diverse and risk prone. Also characterized by low level of productivity and low input usage. Variability in rainfall results in wide variation and instability in yields. Therefore, priority is to be given to the holistic and sustainable development of rainfed areas based on watershed approach. For development of these rainfed areas programmes like construction of Water harvesting structure, Earthen Check Dam are to be taken besides dry land horticulture and agro forestry activities.

10.2 **Construction of Water Harvesting Structures:** At the rate of Rs. 1.00 lakh per structure, 2200 water harvesting structures are proposed to be constructed.

10.3 **Silt Detention Dams:** Dams are essential to prevent siltation of water bodies. At the rate of Rs. 91,300.00 per structure, 1108 structures are proposed to be constructed.

10.4 **Earthen Check Dam:** At a unit cost of Rs. 12,300.00 per structure, 5280 structures are proposed to be constructed.

10.5 **Dryland Horticulture and Agro-forestry:** At Rs. 15,000.00 per hectare, about 4000 hectares of degraded land is proposed to be brought under this scheme.

10.6 Physical targets:

Sl. No.	Items	2008-09	2009-10	2010-11	2011-12	Total
1.	Water harvesting tanks (structure)	600	600	600	400	2200
2.	Silt detention dams (structure)	300	300	260	248	1108
3.	Earthen Check dam (structure)	1320	1320	1320	1320	5280
4.	Dry land horticulture (Hectare)	520	520	524	520	2084
5.	Agro-forestry	480	480	480	480	1920

10.7 Financial requirements:

Sl. No.	Items	Financial requirement (Rs. Lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Water harvesting tanks (structure)	600.000	600.000	600.000	400.000	2200.000
2.	Silt detention dams (structure)	273.90	273.90	237.38	226.42	1011.60
3.	Earthen Check dam (structure)	162.36	162.36	162.36	162.36	649.44
4.	Dry land horticulture (Hectare)	78.00	78.00	78.60	78.00	312.60
5.	Agro-forestry	72.00	72.00	72.00	72.00	288.00
	Total	1186.26	1186.26	1150.34	938.78	4461.64

## **11. Mini Weather Station**

11.1 The success and failure of agricultural enterprises depend on whims of weather. Bihar is the state where there is too much variability and uncertainties of weather condition leading to recurring hazards such as heat wave, cold wave, drought and flood. All these weather conditions play havoc in Bihar agriculture, thus bringing great misery to the farming community. One of the reasons ascribed to low level of productivity is high propensity towards natural hazards constraining investment in agriculture and also the adoption of modern technology. In view of this fact knowledge of cyclic change of good and poor year of rainfall conditions based on historical data becomes good source of information reducing cost of relief operation during drought and flood consequently tackling these hazards more systematically. Not only would the temperature data analysis on district level prove adequate information tool for successful crop management under changing warming scenario. In this road map, establishment of mini weather station at each block is planned. The scheme will be implemented in consultation with the IMD.

## **12. Bihar State Micro- Irrigation Project (BSMIP)**

12.1 Bihar State Micro Irrigation Project (BSMIP) envisages bringing an area of 2,00,000 ha under drip and sprinkler irrigation systems covering 534 blocks in 38 districts of the state of Bihar, involving a total project cost of Rs 708 crores. The programme will be implemented so as to cover all possible crops, which are amenable to adoption of drip or sprinkler irrigation systems. The project will be implemented in a planned phased manner during the next 4 financial years.

12.2 The specific objectives of the project are as follows:

- To improve water utilization efficiency.
- To improve energy use (power/ electricity) efficiency in irrigated agriculture.
- To increase farmers' income and consequently improve their standard of living.
- Use of sprinkler and drip systems will depend on crop suitability. Initially it is planned to cover one lakh ha each under sprinkler and drip irrigation systems.
- To empower the farmers with improved technological package including new growing methods, irrigation, fertigation & crop management practices to overcome (or mitigate) the misery under unpredictable agricultural and diverse agricultural conditions.
- To impart pre & post harvest technological practices to farmers so as to grow and produce quality fresh agricultural commodities to meet international standards consequently stretching the market base in addition to the domestic local markets.

12.3 Operationalization of the Project

- The state govt has to approve expenditure for providing financial assistance for equipment of Micro Irrigation system for Drip and sprinkler to the farmers of the state. A break up of the project cost, financial required, central government share and state share is given in the table 1 below.
- An independent govt nodal agency having complete infrastructure may be assigned the responsibility to implement the Micro Irrigation Project in the state. Fortunately, one such agency called ATMA exists in the state and has widespread

infrastructure at the district and block level. The same can be suitably augmented to meet the demands of BMIP.

- Financial assistance to be made available to all farmers in all district of the state of Bihar, for all crops except paddy and jute crops.
- Due to different spacing of Agriculture & Horticulture crops, the cost of Drip & sprinkler installation per hectare differs according to the spacing. Thus the state government based on technical specifications and discussion with the MIS suppliers and Govt Technical Committee shall decide the unit cost of the system.
- Total cost of products & services of the system provided by the Micro Irrigation System (MIS) agency i.e. the financial assistance component and farmers share shall be totally paid by the state govt, and the farmers will deposit their share with the State Govt Agency.

#### 12.4 Subsidy by the Central & State Government:

The following is the subsidy structure suggested for the project.

General Farmers (Small/ Marginal/ SC/ ST/ Women): 70%

Maximum amount of subsidy to be paid to a farmer, as under

Sprinkler Irrigation System: Max area of 5 ha and financial assistance of up to Rs 50,000.

Drip Irrigation and Micro Sprinklers: Max area of 4 ha or Rs 2,00,000.00

In case the farmer installs both sprinkler and drip irrigation systems at his farm the max amount of subsidy should be Rs 2,50,000 subject to area limits prescribed above.

### 12.5: Area planned under different sectors: (Drip irrigation systems)

(Amount : Rs. in lakh)

Sl. No.	Drip Irrigation system	Area (Ha)	Estimated cost per ha. (Rs. Lakh)	Total estimated system cost (Rs. Lakh)	Subsidy				Farmers' share
					Gol share (40%)	Present State Share (20%)	Additional State share (10%)	Total	
1	Mango, Litchi, Guava	80,000*	0.35	28000	11200	5600	2800	19600	8400
2	Banana	8,000*	0.90	7200	2880	1440	720	5040	2160
3	Vegetables	10,000*	1.30	13000	5200	2600	1300	9100	3900
4	Sugarcane	1,500**	0.90	1350	540	270	135	945	405
5	Flower culture	500*	1.40	700	280	140	70	490	210
	<b>Total</b>	100,000		50,250	20,100	10,050	5,025	35,175	15,075

### 12.6: Area planned under different sectors: (Sprinkler/rain gun/rain pot irrigation system)

(Amount : Rs. in lakh)

Sl. No.	Sprinkler/rain pot/ rain gun	Area (Ha)	Estimated cost per ha. (Rs. Lakh)	Total estimated system cost (Rs. Lakh)	Subsidy				Farmers' share
					Gol share (40%)	Present State Share (20%)	Additional State share (10%)	Total	
1	Vegetables	4,000	0.35	1400	560	280	140	980	420
2	Potato	10,000	0.35	3500	1400	700	350	2450	1050
3	Sugarcane	1,000	0.35	350	140	70	35	245	105
4	Agricultural crops	85000	0.18	15300	6120	3060	1530	10710	4590
	<b>Total</b>	100,000		20550	8220	4110	2055	14385	6165

Assumed that\* 50% area will be under small/marginal/SC/ST farmers and 50% bigger farmers.

\*\* 45,000 ha will be under small/marginal/SC/ST farmers and 40,000 ha bigger farmers.

**Project Details of BSMIP:**

Total Project cost : Rs. 708.00 Crores

(a) Proposed Financial assistance : Rs. 495.60 Crores.

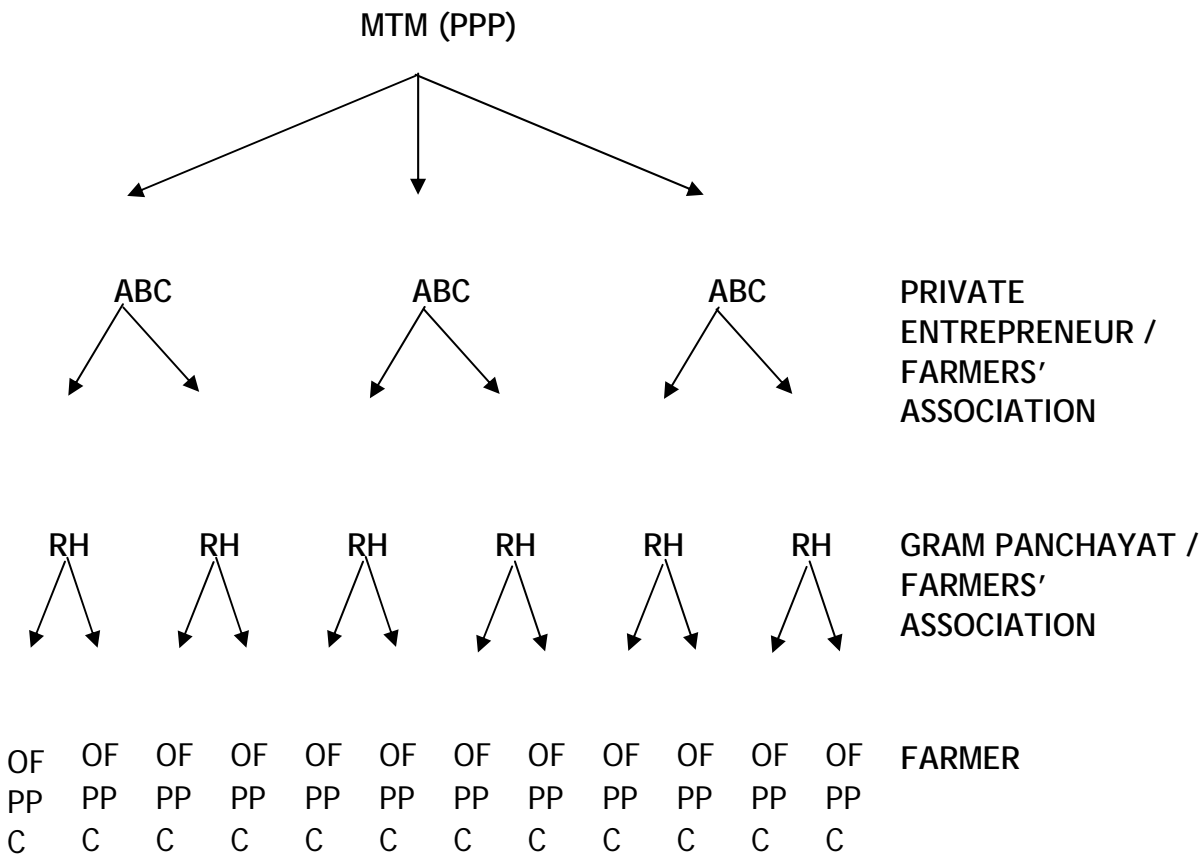
- Area Planned in the project : 2.0 lakh hectares.

Sl. No.	Financial Year	Area		Total Area (Ha.)	Financial assistance (Rs. Crores)
		Drip irrigation (Ha.)	Sprinkler irrigation (Ha.)		
1.	2008-09	10,000	15,000	25,000	57.307
2.	2009-10	20,000	25,000	45,000	105.846
3.	2010-11	35,000	27,500	62,500	163.606
4.	2011-12	35,000	32,500	67,500	168.841
	<b>Total</b>	<b>100,000</b>	<b>100,000</b>	<b>200,000</b>	<b>495.600</b>

# 13. AGRICULTURE MARKETING DEVELOPMENT

13.1 Introduction: In 2006 Bihar Agricultural Produce Marketing Act, 1960, was repealed. From the time Bihar Agriculture Produce Market (Repeal) Act 2006 became effective, the Government of Bihar has been engaged in devising ways and means to address the issues of ensuring that a larger share of the final price goes to the farmer in the State. This road map proposes comprehensive development of agricultural markets from farms to state of art terminal markets.

13.2 Agricultural Market Development Programme: At the apex of the marketing system in Bihar, there will be Model Terminal Markets (MTM) that would be linked with Agri-Business Centres (ABCs), Rural Hats (RHs) and On Farm Primary Processing Centres (OFPPCs). The ABCs, RHs and OFPPCs will be directly marketing agricultural produce but will also have the option of linking farmers with the MTMs in the area. An integrated market infrastructure in the State would look like as below:



13.2.1 By way of support infrastructure 8 to 10 KM of road would be essential for providing last mile connection to MTM and other markets. This funds for these roads can be located in NREGP, Pradhan Mantri/Mukhya Mantri Sadak Yojana and Road Construction department. Full back-up power supply arrangement through Gen Set is also considered essential as also telecom and water supply arrangements at MTMs and other markets.

13.2.2 The comprehensive market infrastructure scheme also propose to make optimum utilization of the assets of the erstwhile "Bihar State Agricultural Marketing Board". Presently the BSAMB owns a total of 1324 acres of land in 95 markets of Bihar, out of which 54 have developed infrastructure on them, and were being used extensively. Out of these 54 market yards, 40 were developed with IDA assistance, 12 with NABARD help and one each by BSAMB and others.

13.3 **Modern Terminal Markets:** Terminal Market Scheme has been introduced in several states and Union territories. In Bihar, processes leading to establishment of an MTM near Patna are under progress. It is proposed that besides Patna, MTMs in the State may be set up at Muzaffarpur, Purnia, Bhagalpur and Gaya Divisions.

13.3.1 These Terminal Markets will provide mega scale collection and market of agricultural produce near all the areas of production. These markets will be equipped with state-of-art facility of international standards to focus on substantial growth in the production, export and modernization of trade. These markets will be equipped with cool chain, electronic grading, electronic auction, ripening chambers, colour vision system, quality station, spot commodity trading, laboratory for testing and certification, banking support, cash spot payment through ATMs to the growers, information kiosk and one-stop shopping for inputs, agri-clinic and extension services. The Terminal Markets will also be supported by Collection Centres and would also have adequate backward and forward linkages with the producers as well as the consumers.

13.3.2 Looking at the proposed facilities at other MTM locations and investment proposed would be around Rs. 100 crore per MTM . This amount would be by way of private investment (equity or loan) and equity from National Horticultural Mission. If the entrepreneur requires land from the State government, then the value of land will

be Government of Bihar's equity in the project. It is also stipulated that total government equity in the project will be capped at 49%.

**13.4 Agri Business Centres** The focus of the marketing interventions would be the development of organisational capabilities and infrastructure facilities to raise farm incomes. To achieve these objectives, 'Agri Business Centres' (ABCs) will be promoted in important production belts of Bihar which are expected to become central point for forward and backward linkages in the value chains and will be equipped with infrastructure according to the requirements of target produce. The ABCs will undertake various post harvest treatments to enhance shelf life, segregation of various grades, primary processing, packing and local marketing to get better realisation for the growers. They will also provide market and weather information and soil testing services. In case of ABCs proposed to be set up in production belts of the bulk commodities like potato and onion; cold storage and warehousing will also be created for short and long term storage to take advantage of price arbitrage by deferring sale from peak harvest to lean periods.

**13.4.1** With the cost of 1 market yard being developed as ABC is estimated around Rs.5.7 crores, depending upon the product basket of the region. The cost for 40 ABCs would be in the range of Rs. 228 crores.

**13.5 Rural Hats** There are 1500 rural hats in the State of Bihar. A majority of these hats comprise only strips of land where producers and buyers meet for a few hours on appointed day and time. The development of rural hats particularly in regard to availability of market infrastructure facilities is more relevant in case of fruits and vegetables. The development of market infrastructure facilities particularly in the rural areas covering rural hats has become the most important area for triggering processes that would improve farm-business of fruits and vegetables.

13.5.1 The following five basic minimum physical facilities may be recommended for development in each rural hat:

- i) Market shed
- ii) Storage facilities
- iii) Covered auction platform
- iv) Open drying platform
- v) Drinking water facilities

13.5.2 Cost of development of one hat is estimated at Rs. 35 lakhs. For management of the hat and execution of the project, transfer of these hats to local gram panchayats on lease basis will be considered. Detailed projects for each hat will be prepared and funds from all schemes like NREGS, NHM etc will be pooled.

13.5.3 Financial requirement:

(Rs. In lakhs)

S.No.	ITEM	2008-09	2009-10	2010-11	2011-12	Total
1	Additional facilities for post-harvest operations in rural hats/markets	13125.00 (375)	13125.00 (375)	13125.00 (375)	13125.00 (375)	52500.00 (1500)
	TOTAL	13125.00	13125.00	13125.00	13125.00	52500.00

NOTE: The figures in parentheses indicate no. of hats to be taken up.

13.6 **ON FARM PRIMARY PROCESSING CENTRES (OFPPCs)** The real breakthrough in encouraging value addition and improving farm incomes will come by creating facilities for on-farm processing of horticultural produce. Restricting the post harvest losses can be achieved both through inputs of technology, and creation of necessary infrastructure. The deterioration in the produce starts immediately after harvest and continues till the produce reaches the ultimate consumer. The interventions planned will accordingly have to begin at the production (farm) level and continue to the disposal (market) level. The proposed facility is being planned with multi disposal options. The farm level infrastructure (On Farm Processing Centre) may be a stand alone facility, disposing off the produce after primary processing at the farm gate

itself, or be a feeder point for supplies of the primary processed produce to Agri Business Centres / Modern Terminal Markets / Mega Food Parks.

13.6.1 Bihar is among the leading horticulture states in the country. Bihar is the largest exporter of litchi. Vegetable production is a major agricultural activity in Bihar. Higher fertility level of the soil and availability of technical knowhow has led to Bihar being recognized as the major producer of high value horticultural crops. The farmers are progressive and willing to adopt new technologies and avenues for improving the profitability of the farms. With a better awareness and appreciation for better post harvest management, such low cost facility (OFPPC) is likely to be very popular in Bihar.

13.6.2 Interventions expected through OFPPCs are:

- Scientific harvesting
- Washing
- Sorting and grading
- Curing in case of some vegetables
- Special Post Harvest Treatments like fumigation / sulphitation
- Vermicompost:
- Plastic Crates:

13.6.3 This low cost facility will consist of a 100 sq.m. covered shed (thatched / corrugated steel sheet roof) with open sides (with wire mesh), for receiving and dispatch, space for special post harvest treatments, curing, storage of plastic crates with graded / ungraded produce, grading, etc. Modern harvesting tools and implements, weighing machine etc. will also be made available at the facility. Arrangements will also be made for special post harvest treatments, as mentioned earlier.

13.6.4 It is proposed to set up a total of about 10,000 such On Farm Processing Centres, in Bihar at a total investment of Rs.120 crores. (200 centres per Agri Business Centre). Besides, 7000 OFPPCs are also being planned to be set up under ADB TA 4814-IND in the State. These OFPPCs will provide tremendous support to the farmers looking for on-farm storage and primary processing facilities with having linkages with Rural Hats, ABCs and MTMs.

**13.7 Agricultural Market intelligence:** Currently, when there are no organized markets in the State and the State Agricultural Marketing functionary is not collecting and compiling any market information, there is no records of market arrivals and market prices of different commodities. Not only farmers, but other stakeholders are also in situation where it is not easy to decide upon the prices. As there is no market information collection and compilation system, therefore any worthwhile market intelligence system is not operational in the State.

13.7.1 It is proposed to develop a market intelligence system that would disseminate market-related (prices, demand trends etc.), crop related and risk related information. Online dissemination of data is also considered for which a dedicated website will be developed.

**13.8 CAPACITY BUILDING:** Bihar, as the State is initiating its agricultural marketing development activities in a new form, there is need to analyse the role of each shareholder in the whole value chain and accordingly a capacity building programme need to be devised. Major stakeholders in agricultural value chain can be following:

- i. Farm workers and farmers, representatives of farmers' associations and groups: production, cultivation, post harvest activities at farm level.
- ii. Transporters: Handling of all the commodities during transportation.
- iii. Laborer at the market yards / primary processing facilities / processing facilities: handling of commodities.
- iv. Entrepreneurs, Traders, Wholesalers: Supervision of various activities such as grading, sorting, packaging, transportation and storage of commodities,
- v. Processors: various value addition activities at different level.

13.8.1 It is proposed that there should be a **State level Agricultural Marketing Development and Training Institute** for training of government officials, traders, entrepreneurs, farmers' representatives etc. The institute would organize training on following aspects:

- ❖ Agricultural Marketing operations such as grading, sorting, packaging etc.
- ❖ Marketing development procedures;

- ❖ Commodity exports, legality and documentation
- ❖ Marketing intelligence
- ❖ Entrepreneurship development in agricultural marketing
- ❖ New technology and machinery uses, marketing infrastructure development
- ❖ Agricultural marketing related extension activities
- ❖ Use of computer and information technology
- ❖ Food safety and quality issues etc.

13.8.2 The State Government should engage experts or hire services of consultants for detailing out the facility required and capacity building need assessment. Based on these exercise detailed investment plan can be worked out.

**13.9 INSTITUTIONAL MECHANISM FOR MARKET DEVELOPMENT:** For planning and executive the work related to MTMs, ABC, rural huts etc. and also for taking up various agricultural marketing development activities in the State and for asset management of erstwhile APMCs, putting in place a institutional mechanism would be studied in depth by the state government.

**13.10 Financing Market Development:** The State Government proposes to leverage its fixed assets (existing land, building, market yards etc.,) for financing the scheme. The main source of funding will be subsidy under various Government of India schemes and private investment in the form of equity or loan, wherever there are gaps State plan funds will be used.

**13.11 PROJECT COST:** The summary of project cost is given below:

S. No.	Marketing Infrastructure	Physical targets (Nos.)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Modern Terminal Markets	1	1	1	1	4
2.	Agri-Business Centres	20	10	5	5	40
3.	Rural Haat	375	375	375	375	1500
4.	OFPPC	5000	2000	1500	1500	10000

S. No.	Marketing Infrastructure	Financial requirement (Rs. lakh)				
		2008-09	2009-10	2010-11	2011-12	Total
1.	Modern Terminal Markets	10000.00	10000.00	10000.00	10000.00	40000.00
2.	Agri-Business Centres	11400.00	5700.00	2850.00	2850.00	22800.00
3.	Rural Haat	13125.00	13125.00	13125.00	13125.00	52400.00
4.	OFPPC	6000.00	2400.00	1800.00	1800.00	12000.00
	Total	40525.00	31225.00	27775.00	27775.00	127200.00

## 14. MILESTONES

14.1 When actions and programmes proposed in this road map is completed, that is, on the dawn of the 11<sup>th</sup> Five year, that following milestones are projected to be achieved:

14.2 Enhancement of Crop productivity.

i.	Rice	14.86 Qtl/ha to 29.72 Qtl/ha
ii.	Wheat	20.55 Qtl/ha to 30.50 Qtl/ha
iii.	Maize	26.71Qtl/ha to 35.25 Qtl/ha
iv.	Pulses	7.22 Qtl/ha to 10.13 Qtl/ha
v.	Oil seeds	10.32 Qtl/ha to 12.00 Qtl/ha
vi.	Sugarcane	455.6 Qtl/ha to 600.00 Qtl/ ha
vii.	Fruits	109.32 Qtl/ha to 146.05 Qtl/ha
viii.	Vegetables	165.92 Qtl/ha to 200.60 Qtl/ha

(Note: Present productivity figures relate to (2006-07 fruits & vegetables 2005-06 targeted figures relate to 2012).

14.3 Enhancement of Crop Intensity from 133% (2004-05) to 161%.

14.4 Per capita annual agricultural production to increase from Rs. 661 (2004-05) to Rs. 1061.

14.5 The land productivity level in value terms to increase from Rs. 7351 (2004-05) to Rs. 11799.

14.6 Year wise requirement of funds for financing the road map is

Year	Financial Outlay(Rs. in Lakh)
2008-09	922.13
2009-10	916.70
2010-11	977.02
2011-12	941.27
Total	3757.12

14.7 Thus for agriculture sector itself, the total fund requirement is expected to be about Rs. 4000 crores in the next four years. Year wise financial requirement for the roadmap (revised) is as below, Rs. In Crores

particulars	2008-09	2009-10	2010-11	2011-12	Total
Amount	922.13	916.70	977.02	941.27	3757.12

14.8 The road map will be financed through on going state plan schemes, additional central plan schemes and also through mission mode schemes where financial resources are routed through non budgetary sources. Gap funding will be resourced through new state plan schemes. Besides for schemes viz. marketing, plant protections which have private sector participation balance funding will come through equity/loan. Viability gap funding for projects in PPP mode will be from the State Plan.

14.9 The road map scheme for the year 2008-09 is proposed to be funded in the following manner(Amount in Rs. Lakh)

Name of scheme	Financial Requirement	State plan including state share of CSS	Special Central Assistance (RKVY)	Central Share of CSS	Non budgetary transfer					Grand Total
					NFSM	NHM	Atma	Micro Irrig.	Total	
Seed Plan	9893.64	2558.39	1561.10	2500.00	3274.15				3274.15	9893.64
Soil Health Management	7600.00	2450.00	1600	250.00	3300.00				3300.00	7600
Crop Protection	3852.03	1890.00	1000.00		290.00				290.00	3180
Farm Mechanization	7920.00	2820.00	1000.00	4100.00						7920
Transfer of Technology	3911.64	1000.00	111.64	800.00	1000.00		1000.00		2000.00	3911.64
Agricultural Extension(E-Kisan Bhavan)	4843.50	3843.50	1000.00							4843.5
Integrated Farming Model	75.00		75.00							75
Soil & Water conservation	1186.26	900.00	286.26							1186.26
Agricultural Marketing Development	40525.00					7281.25			7281.25	7281.25
Cold storage	6675.00					1668.75			1668.75	1668.75
Micro irrigation	5730.07	1719.02						2292.03	2292.03	4011.05
Total	92212.14	17180.91	6634.00	7650.00	7864.00	8950.00	1000.00	2292.03	20106.03	51571.09

14.10 The rest of the financial requirement, that is Rs. 40641.05 Lakh is expected to be met through private investment.

#### 14.11 Monitoring and Concurrent evaluation

14.11.1 To monitor the activities of the roadmap it is proposed that a high level committee under chief secretary may be constituted. The committee may meet once in a month and review the progress and suggest mid term corrective action.

14.11.2 A cabinet committee may be constituted to monitor the activities of the road map. The committee may meet once in three months .

# **ROAD MAP FOR ANIMAL HUSBANDRY**

## 15. Animal Husbandry

15.1 Introduction: Animal husbandry is a core sector of the State economy. It provides opportunities for poverty alleviation, Development of rural economy, combating rural unemployment and abridges the increasing gap between poor rural and affluent urban society. The economy of 89% population of the state is directly or indirectly linked with this sector. Apart from rural masses, the health, the life-style and the safety too of the affluent people is linked to this sector through dependence on milk, meat, egg, wool, leather and dogs.

The multifaceted scope of animal husbandry activities depend upon – animal protein availability for human consumption, sufficient & sustainable wealth generation for rural people and creation of self employment opportunity for unemployed youth. These objectives will be full filled by continuing the ongoing Plan and Non Plan schemes of the department & by adopting the new ones. Following statistical figure shows the situation where we are and where ought to be.

### State Animal Scenario

S.No	Specification	No. in Bihar (In lakh)	% of national figure
1.	Cattle	105	5.90
2.	Buffalo	58	6.20
3.	Breedable Cattle & Buffalo	67	8.40
4.	Sheep	05	0.80
5.	Goat	96	8.40
6.	Pigs	06	4.40
7.	Others	02	0.90
8.	Poultry	140	3.26

(Source: Livestock census 2003)

## 15.2 Per Capita availability of Animal Protein

S.No	Item	Bihar	India	ICMR recommendation	Improvement required
1.	Meat	2.58 kg/yr	4.74 kg/yr	10.95 kg / yr	4 Times
2.	Milk	138 gm/day	238 ml/day	300 ml / day	3 Times
3.	Eggs	10.30 / yr	45 / yr	180 / yr	17 Times

## 15.3 INFRA STRUCTURAL FACILITIES

S.No	Facilities	Sanctioned	Available	Required
1.	No. of Veterinary Doctors	1729	920	3260
2.	Assisting Staff	6219	3880	16300
3.	Artificial Insemination Centre	1401	500	6700
4.	Poultry Farms	03	03	Strengthening
5.	Cattle Farms	03	03	Revival
6.	Goat Farm	-	None	01
7.	Frozen Semen Bank	04	-	38

The above figures show that we have to make improvement in meat, milk and eggs by increasing four, three and seventeen times in their present production to meet the ICMR recommendation.

## 15.4 STRATEGIES TO ACHIEVE THE TARGET:

- By filling up the vacant post on regular appointment on contractual basis
- By increasing the no. of Vety. Doctors & paravets in existing Vety hospitals / Dispensaries.
- By providing facilities of competent and subject-matter specialists in the sub divisional level vety. hospitals.
- By providing better infrastructural facilities to hospitals.
- By providing door-step vety. services to needy.

- By re-organizing the present organizational pattern of AHD & taking services of paravets on contractual basis.
- By modernizing & strengthening the Institute of Animal Health and Production at Patna.
- By promoting and potentiating the work of Bihar Livestock Development Agency (BLDA) particularly in terms of Animal Breeding Programme.
- By establishing one artificial insemination unit at every 1000 breedable animals.
- By controlling & eradicating the contagious & dreadful diseases of economic importance e.g. H.S., B.Q., F.M.D. & Parasitic Diseases.
- By proper disposal of carcass.
- By implementing the fodder developmental programme.
- By renovating & developing the Cattle & buffalo breeding Farms by government and on Public Private Partnership basis.
- By genetic improvement of local goats through establishing goat breeding farm and by promoting the Back yard goat rearing system.
- By improving poultry farming of Low Input varieties.
- By conserving the threatened native breeds of Livestock.
- By implementing the programme of extension coverage & knowledge dissemination through organizing vety. Camps, seminar, workshop, trainee & refresher courses.
- By promoting the private organization to go for liquid nitrogen production, cattle and poultry feed manufacturing & by fodder seeds production.

**Scheme wise description and their financial estimated cost in different succeeding years for major components are being described in following paras :-**

## **15.5 DOOR STEP VETERINARY SERVICE**

### **15.5.1 OBJECTIVES**

1. To meet the emergency situation of ailing animals at the doorsteps of the owner.
2. To get rid of the problems of bringing the ailing animals to the dispensary.
3. To mitigate the stress of the ailing animals caused due to their movement.

## 15.5.2 IMPLEMENTATION

1. It is the demand of the time that the veterinary services should be provided at the door steps of the animal owners. The national agriculture commission 1976 recommends one veterinary doctor for every 5000 cattle and 2 veterinarians in each veterinary dispensary / hospital in order to provide door step veterinary services to the needy cattle owners.
2. The door step veterinary services will be provided by increasing better infrastructural facilities in terms of number of veterinary doctors and by well equipping the veterinary dispensary / hospital. For this a motorcycle, Mobile phone, buildings, instruments, furniture, medicine etc will have to be provided at each dispensary / hospital.
3. The veterinary officers posted in the dispensary / hospital will attend the OPD on rotational basis. On call for attending the sick animals that are unable to be brought to the dispensary one of them will attend such cases on the owners' doorsteps. The services will be provided on no cost basis.
4. A vet will have to attend at least 50 cases in a month i.e. 100 calls per hospital per month. These cases will be in addition to the cases brought to the dispensaries.
5. Vets & Paravets will have to maintain a log book for motorcycles.
6. Persons with primary knowledge of veterinary science preferably with diploma course will be engaged as paravets on contractual basis.

### APPROXIMATE COST EXPENDITURE ON ONE DISPENSARY / HOSPITAL

Sl. No.	COMPONENTS	COST (in lakhs)
1	Construction of the building	26.70
2	Infrastructural Cost (Instrument & Furniture)	01.00
3	Motorcycle and Mobile phone facilities for two doctors & M/cycles for 3 paravets	2.60
4	Fuel @ 25 Litres a month, Repair, and Recharge coupon for Mobile phone	1.00
5	Remuneration to paravets @ Rs.8,000/Month	2.88
	<b>TOTAL</b>	<b>34.18</b>

Thus the year wise breakup (cost) on this programme is as follows

Sl.No.	Year	No. of dispensary / hospital to be equipped	Cost (in lakhs)
1	2008-09	200	6836.00
2	2009-10	200	6836.00
3	2010-11	212	7246.16
4	2011-12	212	7246.16
	<b>TOTAL</b>	<b>824</b>	<b>28164.32</b>

(Rupees Two Hundred Eighty one Crores Sixty four Lakhs & thirty two thousand only)

## 15.6 DOOR TO DOOR VACCINATION AND DRENCHING PROGRAMME

### 15.6.1 OBJECTIVES

1. Safeguarding the animals against dreadful diseases.
2. Vaccination of animals at their door steps.
3. Protecting health and enhancing the production.
4. Lessening the labour cost and time of the owner caused due to animals movement.
5. Minimizing the stress of vaccination & drenching to the animals due to their travel from byre to vaccination site.
6. Creating part time employment opportunities for the unemployed para vets / vaccinators.

### PERIODS FOR VACCINATIONS AND DRENCHING

1. H.S. & B.Q. ----- May & June
2. F.M.D. ----- Nov & Dec
3. Drenching ----- March & Oct (Pre-vaccination period)

## 15.6.2 IMPLEMENTATION

- DAHO on the recommendation of the pramukh and concerned veterinary officers will select the unemployed vaccinators ( Pashu Mitra ) at the rate of 2 vaccinators per dispensary.
- Veterinary officers of the block will allocate the panchayats among themselves for the purpose.
- The vaccinators will vaccinate the animals of a particular village preferably in a day.
- After completion of the work assigned to them in a particular village, the vaccinators will have to attain a certificate to this effect from the concerned panchayat representative.
- The D.A.H.O. will pay the remuneration to the vaccinators on the recommendation of the concerned veterinary officers.
- Payment will be made by bank accounts.
- Every vaccinator will be paid @ Re1.00/- per animal vaccinated per vaccinator with a maximum of Rs.100/-daily. Same rate will be applicable in case of drenching and other veterinary services programme too.

### APPROXIMATE ESTIMATED COST FOR DOOR TO DOOR VACCINATION PROGRAMME

(Rs. In Lakhs)

Sl. no.	Name of the vaccine / Anthelmintics	No. of animals targeted (80 of total animals)	Cost of vaccines / anthelmintics	Cost for vaccination aids @ Rs.2 per animal	Expenditure on remuneration to vaccinators in lakhs	
1	H.S. & B.Q. @Rs.3/dose	134	402.00	268.00	134.00	804.00
2	F.M.D. @Rs.7/dose	134	938.00	268.00	134.00	1340.00
3	Broad Spectrum Anthelmintics @Rs.30/dose	134	4020.00	-	134.00	4154.00
	TOTAL	402	5360.00	536.00	402.00	6298.00

### Year wise financial expenditure of vaccination and drenching programme

Sl. No.	Component of work	FINANCIAL YEAR				TOTAL
		2008-09 (80%)	2009-10 (85%)	2010-11 (90%)	2011-12 (95%)	
1	H.S. & B.Q	804.00	882.00	960.00	1044.00	3690.00
2	F.M.D	1340.00	1470.00	1600.00	1740.00	6150.00
3	Broad Spectrum anthelmintics	4154.00	4557.00	4960.00	5394.00	19065.00
	<b>TOTAL</b>	<b>6298.00</b>	<b>6909.00</b>	<b>7520.00</b>	<b>8178.00</b>	<b>28905.00</b>

Assuming that the cost of vaccine and anthelmintics will remain constant in next five years. Yearwise no. of animals has been calculated with 3% increase/yr.  
District wise break-up for Door to Door Vaccination

#### 15.7 STRENGTHENING OF A H OFFICES

##### 15.7.1 OBJECTIVES

- To have a strict and efficient administration over the subordinate offices.
- To keep a close contact with them.

#### APPROXIMATE COST EXPENDITURE

(Rs. in Lakhs)

S.No.	Office of	Fax Machine @ Rs.8000.00	Computer Set @ Rs.40000.00	Furniture@Rs.60000.00	TOTAL
1	R.D. (8)	0.64	3.20	4.80	8.64
2	D.A.H.O. (38)	3.04	-	22.80	25.84
3	S.D.A.H.O. (36)	2.88	14.40	21.60	38.88
	<b>TOTAL</b>	<b>6.56</b>	<b>17.60</b>	<b>49.20</b>	<b>73.36</b>

**15.8 EXTENTION COVERAGE AND KNOWLEDGE DISSEMINATION:** Veterinary graduates after their graduation from the college are appointed to different posts in the department of Animal Husbandry. They start working in the dispensaries with fresh technical knowledge but as the time goes on, they require acquaintance with recent developments in the veterinary sector. They fill shaky in tackling the recent problems. Hence, they require to be refreshed with recent developments at regular interval. For this vets will be sent for refresher courses at different renowned institutes outside the state. A target of 200 vets per year for the training has been set so that at five year interval, they again get the opportunity for the refresher course. Like wise for the officers in the rank of SDAHO, DAHO, RD etc administrative training will be imparted. Refresher course training will be of 15 days while administrative training will be of 6 days duration. The guidelines and standards affixed by Veterinary Council of India will be followed for knowledge dissemination of doctors and officers.

#### APPROXIMATE COST EXPENDITURE

(Rs.in lakhs)

Sl. No.	Post	FINANCIAL YEAR				TOTAL
		2008-09	2009-10	2010-11	2011-12	
1	RD (8)	0.32	-	-	-	0.32
2	DAHO (38)	1.52	-	-	-	1.52
3	SDAHO (36)	1.44	-	-	-	1.44
4	VO (200)	20.00	20.00	20.00	20.00	80.00
	TOTAL	23.28	20.00	20.00	20.00	83.28

Expenditure for refresher course to vets has been calculated @Rs.0.10Lakhs/vet including Tuition fee, traveling cost, fooding & lodging etc. No T.A. and other allowances will be claimed from their own establishment.

**15.9 GOAT BREEDING CUM REARING FARM :** Goat meat is the most accepted and major source of meat available for human consumption in Bihar. The per capita availability of meat in Bihar is 4 times less as per the recommendation made by ICMR. Goat is the poor man's cow and there are tremendous scopes to enhance its

production in Bihar. Unfortunately the state has not any recognized goat farm at present from where the people can get the seeds of goat. The problem may be solved by establishing a goat breeding and rearing farm (Black Bengal & Jamnapari) and by distributing the nannies amongst BPL section of people under certain planned programme. Consequently the goat keeping is a major and sustainable means of rural economy improvement. For goat development in the state the Govt. will concentrate mainly on two points:-(1)Grading-up of local breed with improved germ plasm (2)Replacing the existing local breed by improved variety of kids produced from the goat farm.

#### 15.9.1 PRESENT SCENARIO

- Demand of goat meat (Chevon) is increasing day by day.
- This is most popular and accepted form of meat.
- The goat population of our state as per 2003 livestock census is 96Lakhs which is 8.40 % of national figure.
- Low variety of goats is reared by the villagers resulting into less production and low income.

#### 13.9.2 OBJECTIVES -

- To establish a source of superior germplasm.
- To disseminate the same among the interested breeders of BPL section.
- To involve the female members of BPL society family for economy generation.
- To help marginal and landless farmers of rural areas to improve their economic status by improved goat rearing.

15.9.3 WORK PLAN: It will be started initially with 500 does and 25 bucks in Govt. cattle farm at Purnea on pilot basis. On seeking expression of interest, it may also be established on PPP basis.

- 50% of the kids produced in the farm in 6 months will be sold at subsidized rate to the people on their demand and on recommendation of the concerned veterinary officers & Panchayat representative.

- The manner of distribution and cost will be determined by a committee consisting of the farm in-charge, veterinary officer and prakhand pramukh of that area.
- 40 % of the kids produced from the farm will be sold in the open market by the in -charge of the farm.
- Rest 10 % of the kids generated will be kept in the farm for increasing their number.
- Five kids will be provided to BPL section of people with a condition that after two years they will return 5 kids to the farm for distribution among other BPL families.
- In this way more and more families will be covered and gradually the goat population of quality breed will increase.

#### 15.9.4 FACILITIES REQUIRED FOR ESTABLISHING THE FARM -

- Land - It is available in government farm Purnea.
- 10 goat sheds of 20' x 30' area for keeping 50 goats in each will be constructed.
- 2 kids sheds for 1-2 months age group with special protection design from cold and heat waves will be constructed.
- One feed godown of 40' x 30' x 20 will be required to store the feed for feeding the goats.
- Buck shed with partition wall will be constructed to provide shelter for 25 breeding bucks.
- One office laboratory of 20' x 40' for lab and office work.
- Green grass will be grown in the premises to provide green grasses to the goats.
- Goats will be sent on pasture for atleast 2-4 hours daily.

#### 15.9.5 APPROXIMATE ESTIMATED EXPENDITURE

### 15.9.5.1 NON-RECURRING EXPENDITURE

(Rs in Lakhs)

Sl. no.	Components	2008-09	2009-10	2010-11	2011-12	TOTAL
1	14 Sheds for goat, Labour Office, Kids @ Rs.500 per Sq.ft	52.00	-	-	-	52.00
2	Installation of pumps and fittings of pipes to all the sheds, office, labs	20.00	-	-	-	20.00
3	Purchase of equipments like generator, refrigerator, deep fridge, computer, lab materials	20.00	-	-	-	20.00
4	500 goats of true to the breed @ 3000 per goat of first kidding / about to kid	3.00 (100 goats)	6.00 (200 goats)	6.00 (200 goats)	-	15.00
5	25 bucks @ Rs.5000 per buck including transportation cost	0.50 (10 bucks)	0.50 (10 bucks)	0.25 (5 bucks)	-	1.25
6	8500 bucks for distribution topanchayat@Rs.5000/buck	105.00 (2100)	105.00 (2100)	105.00 (2100)	110.00 (2200)	425.00
	TOTAL	200.50	111.50	111.25	110.00	533.25

### 15.9.5.2 RECURRING EXPENDITURE

(Rs in Lakhs)

Sl. No.	Components	No. of posts	2008-09	2009-10	2010-11	2011-12	TOTAL
1	Farm Manager (A vet with PG in LBG)	1	-	-	-	-	-
2	Veterinary Officer	1	-	-	-	-	-
3	Livestock Assistant	1	-	-	-	-	-
4	Lab Assistant @ Rs. 8000 a month	1	0.96	0.96	0.96	0.96	3.84
5	Labours @ Rs. 100 / day / labour	10	3.60	3.60	3.60	3.60	14.40
6	Feed & fodder @ 1 Kg and conc @ 250 gms / day	-	3.00	9.00	17.00	18.00	47.00
7	Feed & Fodder for bucks to be distributed @ Rs. 5 per day for 30 days	-	3.15	3.15	3.15	3.30	12.75
8	Miscellaneous	-	0.50	0.50	0.50	0.50	2.00
	TOTAL	-	11.21	17.21	25.21	26.36	79.99

TOTAL: 198.55 lakh (Rupees One Crore Ninety eight Lakhs and fifty five Thousand Only)

15.10 **DISPOSAL OF CARCASS:** Improper way of disposal of carcasses has always been a problem in our state. In terms of zoonotic importance, pollution control spread of and animal diseases. The traditional individual/ community dealing with the profession is now a days dissociating themselves from this profession. This is resulting into improper and haphazard disposal of the carcass. Hence proper and scientific disposal of the carcass is of utmost importance.

### 15.11 OBJECTIVES

- To prevent the animal diseases.
- To control the pollution.
- To safeguard the public health.
- To create a business opportunity for interested persons.
- To expand the business opportunities based on different parts of dead animals.

15.12 SITE OF OPERATION - At Panchayat level.

13.13 PATTERN: The persons will be selected by the Panchayat. They will be provided with diesel operated carriage cart, contingent for scientific disposal and site for cremation / burial.

### 15.14 COST EXPENDITURE :- (PER PANCHAYAT)

		Rs.in Lakhs
1. Cost of diesel operated carriage cart	-	0.20
2. Civil structure for storage carcass parts	-	0.50
3. Lime, salt, rope, labour etc.- @ Rs.500/- / case (60 cases /year)	-	0.30
4. Barricading of cremating / burial place (one acre)		
On an average	-	1.00
Total unit cost	-	2.00
Total cost for 8500 panchayats	-	17000.00

S.No.	2008 - 09 (2100)	2009 - 10 (2100)	2010 - 11 (2100)	2011 - 12 (2200)	Total (8500)
1.	4200.00	4200.00	4200.00	4400.00	17000.00

By expanding of this programme on leather, hide, bone, hooves, horns etc. this will be gradually converted into an entrepreneur.

**15.15 BUFFALO DEVELOPMENT:** To meet the recommendation made by ICMR in terms of per capita availability of milk, the state needs three times improvement in present milk production. The aim can be achieved only by implementing the schemes on cattle and buffalo development programme. A lot has been done and a lot is being done in cattle sector but not in buffalo sector. Buffalo development programme requires an extra consideration to meet the situation in the field of milk production.

#### **15.15.1 PRESENT SCENARIO**

- Demand of buffalo milk is increasing day by day both in individual and in commercial sector.
- The geographical situation of Bihar permits the buffalo rearing practices.
- The total number of buffalo in the state is 58 lakhs out of which the projected figure of breedable female buffalo is 31.47Lakhs app..
- The productivity of buffalo in the state is 3.5 Kg per day on an average.
- The target is to bring it at the level of 7 Kg per day in five year span.

#### **15.15.2 WORK PLAN**

- By genetic improvement of existing buffalo population using Murrah germplasm.
- By improving feeds and fodder situation in Bihar.
- By market channelisation of buffalo milk and its products.
- By promoting the people to go for house hold milk processing and their marketing.

#### **15.15.3 IMPLEMENTATION**

- A Murrah buffalo breeding cum bull rearing farm will be established with a capacity of 45 buffalo cows and 5 buffalo bulls in existing cattle farm at Dumraon.
- In very beginning the buffalo cows will be bred artificially with Murrah semen procured from outsourcing.
- The male calf generated from the farm will be reared to obtain buffalo bull which will be used for frozen semen production at frozen semen station Patna.

- The female calves may be sold as the situation arises.
- The buffalo bull may be distributed in remote areas for natural services on demand from private agencies / panchayat on agreement basis and assessing the situation.
- The above work plan is in supplementation to BLDA, a government statutory body dealing with animal breeding programme in the state.

#### 15.15.4 FINANCIAL EXPENDITURE

##### 15.15.4.1 NON-RECURRING EXPENDITURE

( Rs. IN LAKHS)

Sl. no.	Components	Number	TOTAL
1	Purchase of buffalo cows @ Rs.30000/- per cow	45	13.50
2	Purchase of buffalo bull @ Rs.40000/- per bull	5	2.00
3	Transportation Cost	-	1.50
4	Renovation of the existing cattle farm including new civil construction, repair water supply and others	-	50.00
	Sub-Total	-	67.00

Establishment cost will be born under general existing establishment.

##### 15.15.4.2 RECURRING EXPENDITURE

( Rs.IN LAKHS)

1	Purchase of feeds & fodder in beginning @ Rs.120/- / day / animal	365 days	22.00
2	Fodder cultivation and production with their processings @ Rs.30000/- / hectares	10 hectares	3.00
3	Health care and management @ Rs.500/- / animal / month	-	3.00
4	Office expenditure and transportation	-	1.00
	Sub-Total	-	29.00

TOTAL 96.00 Lakhs

### 15.15.4.3 YEAR WISE FINANCIAL EXPENDITURE

(IN LAKHS)

Sl.no.	Components	08-09	09-10	10-11	11-12	TOTAL	Remarks
1	Non-Recurring	67.00	4.00	4.50	5.00	80.50	5 % annual increase
2	Recurring expenditure	8.00	32.00	35.00	39.00	114.00	In beginning 25 % and then 10 % yearly increase
	TOTAL	75.00	36.00	39.50	44.00	194.50	

### 15.16 PROJECT FOR RURAL POULTRY DEVELOPMENT IN BIHAR

15.16.1 **Introduction:** Bihar is among the lowest poultry egg and meat producers in the country with 10.30 eggs and 2.58 Kg meat from all sources / per capita / per annum. This is also a highly agonizing situation that 75 % of the total egg / meat production are being consumed by 25 % of the total urban population of the state. These highly nutritious foods are available at higher price in rural sector due to absence of proper market and or alternative organizations for making them available at the reasonable reach and prices. Under the compelling situation a proposal for improvement in the poultry for egg and meat production programme in the rural sector is being envisaged with the following objectives:

- To gradually improve the egg available from current 10.30 to 80 per head / year after 5 years.
- To improve poultry meat production from current 76.53 lakh Kg to 91 lakh Kg / per annum.
- Improvement and maintenance of dual purpose germplasm resources suitable for rural development sector to meet the eggs and poultry meat requirements under backyard / semi or free range system of management.

### 15.16.2 Technical programmes/strategy

- The important recognized breed cross germ plasm of (i) Vanraja, (ii) Grampriya and (iii) CARI black - Nirbhik will be taken up from their respective sources, PDP Hyderabad and CARI, Izzatnagar.
- A recurrent reciprocal selection system shall be carried out to find out the best XB to be disseminated in rural Bihar.
- These three elite dual purpose breed will be tested for their performance in the existing Government Poultry Farm of the state.
- The germ plasm of reported best suited breed cross will be multiplied with the level of 2 lakhs / pullet production per annum at each centre.
- There shall be six poultry germplasm resource centres located in different agroclimatic zones of Bihar : Among these six centres Patna, Muzaffarpur, Bhagalpur will be renovated and updated while new centres like Gopalganj, Biharsharif and Kishanganj will be new set up with all modern facilities.
- Each germplasm multiplication centre to be set up for selected variety to raise 2 lakhs chicks from each farm /annum.
- Each centre shall be provided with hatchery establishment with hatching capacity to produce 20,000 chicks per month with cooling period of two months.
- The chicks obtained at item 6 will be reared for 3 weeks in the farm itself and supplied to the selected farmers @ 10 males and 15 females, i. e. 25 birds per family.
- In sum total 8,000 selected farm families will be provided with the improved birds with understanding that they will provide relevant information's to the centre for their production and productivity.
- These birds will be provided for rearing and maintenance to examine the production level in free range system and also to improve the food and economic level and therefore no cost will be chargeable for the supply of 25 birds.
- The expected chick production from three breeds will be as follows :-

Vanraja	-	100 - 110 chicks per year
Grampriya	-	140 - 150 Chicks per year.
CARI Nirbhik	-	150 - 160 Chicks per year.

Each female on an average shall be able to produce 130 chicks / annum therefore, 2000 per annum females and 200 cocks will be maintained at each centre for each pullet year.

- The replacement stock shall be provided through PDP Hyderabad CARI, Izzatnagar, U.P.
- Out sourcing Technical monitoring shall be asked from Eastern Regional Complex of ICAR / Agricultural University / CARI, Izzatnagar and PDP, Hyderabad.
- The operation of fund shall be directly through Incharge Centre who will be an officer of A.H. Department and shall be responsible for timely operation of all the works carried out under this programme.

#### 15.16.3 Expected Production

- Eggs - At the rate of 100 eggs per annum a total of 1.8 million additional eggs shall be available from each centre per year i.e.  $1.8 \times 6 = 10.8$  million eggs per year  $\times 5$  years = 54 million eggs which provide additional 15 eggs per capita to a total of 25 eggs within five years.
- Poultry meat will be available @ of 2.5 kg meat per bird, 6 lakh male population shall contribute additional quantity of 15.0 lakh kg. of poultry meat per annum. The present production of 76.53 lakh kg. of poultry meat will go to 91.0 lakh kg. / year.

#### 15.16.4 Budgetary Requirement

#### 15.16.4.1 Non recurring Expenditure

(Rs. In lakh)

S.No.	Particulars	Amount
1.	Renovation / new construction of 35 poultry sheds CPF, Patna	35.00
2.	Renovation / new construction of 35 poultry sheds at RPF, Bhagalpur.	35.00
3.	Renovation / new construction of 35 poultry sheds at RPF, Muzaffarpur.	35.00
4.	Renovation / new construction of 35 poultry sheds at RPF, Kishanganj.	35.00
5.	Renovation / new construction of 35 poultry sheds at RPF, Gopalganj.	35.00
6.	Renovation / new construction of 35 poultry sheds at RPF, Biharsharif.	35.00
7.	Hatchery building at all the six places @ 2.5 lakhs	15.00
8.	Hatchery Machine complete with installation charges for all six places.	12.00
9.	Compound wall for poultry farms at the places 6x2	12.00
10.	Development of land and roads, power and water supply	15.00
11.	Marshal Vehicle 6 (One for each centre) 6x5	30.00
	Total	294.00

#### 15.16.4.2 Recurring Expenditure

(Rs. In lakh)

S.No.	Particulars	Amount
1.	Feed formulation and requirements of feed for 12000 layers / cocks @ 40 kg. per bird per annum @ Rs. 15,000/T	72.00
2.	Feed requirements for 12 lakhs chicks for 3 weeks (900 tonnes) @ Rs. 15,000/ T.	135.00
3.	Training programme on an average.	20.00
	Total	227.00

Year wise break up

Sl no.	Component	08-09	09-10	10-11	11-12	Total	Remarks
1	Non recurring	147.00	147.00	6.00	8.00	308.00	50-50% first 2yr.
2	Feeds for layers &cocks	36.00	72.00	76.00	80.00	264.00	5% increase per yr.
3	Feeds for cheeks of 3 wks	68.00	135.00	142.00	149.00	494.00	
4	Trainingg programme	10.00	20.00	-	20.00	50.00	
	Total	261.00	374.00	224.00	257.00	1116.00	

**Strengthening of sub-division level hospital situated in Bihar**

The veterinary doctors possessing the basic qualification of B.V.Sc. & A.H. impart their services from the existing veterinary hospitals and dispensaries in the state. Situation arises when specific veterinary services are required for specific cases. At present there is not any provision of specialized veterinary services in any hospital / dispensary. On other hand a large number of P.G. degree holders' veterinary doctors are available in the state. In addition the veterinary doctors working at block level some-times feel helpless in seeking an extra veterinary assistance of specific nature. To cope-up-with above situation it is necessary to strengthen at least the sub-division level hospital by making provision of clinical subject specialists and also by providing ambulatory clinical facilities to them. Thus a proposal of strengthening the sub-divisional veterinary hospital proposed with following objectives is envisaged -

**Objectives:**

- To provide better veterinary services to ailing animals.
- To provide better and specific veterinary services for referred cases.
- To provide door step veterinary services by ambulatory van.

### Implementation:

- Veterinary doctors with P.G. qualification in Medicine, Gynaecology, Surgery and Livestock Production and Management will be posted in the sub-division level hospitals.
- Veterinary hospitals at the sub-divisional level will be constructed. They will have surgical equipments, Medicines, Test facilities, Mobile vans (fully equipped for better treatments at door steps in case of emergency).
- Para vets (4) and 4<sup>th</sup> grade employees will be engaged on contractual basis for assisting the specialists.
- Establishment costs for government doctors, Livestock assistants and peons will be born from the government establishment where as for those engaged on contractual basis, payment will be made from the funds given to the Department of Animal Husbandry by R.K.V.Yscheme.

### Cost on one Sub-divisional level Veterinar hospital

#### Non-recurring

1.	Construction of building	50.00
2.	Infrastructural cost, instruments, furniture	1.50
3.	Fully equipped ambulatory van	5.00
		<u>56.50</u>

#### Recurring

1.	Remuneration to P.G. vets @ Rs.25000/ month	12.00
2.	Remuneration to Para vets @ Rs.8000/ month	3.84
3.	Remuneration to 4 <sup>th</sup> grade @ Rs.5000/ month	2.40
4.	Remuneration to driver @ Rs.5000/ month	0.60
5.	Contingent for fuel @ 10 km/ litre for 1000 km/ month 100 litres/ month @ Rs.40/ litre	0.48
6.	Miscellaneous	<u>0.18</u>
		<u>19.50</u>

Number of subdivisions veterinary hospital - 39

**Non-recurring expenditure**

S. no	Component	2008-09	2009-10	2010-11	2011-12	TOTAL
		(10)	(10)	(10)	(9)	(39)
1	Construction of new building	500.00	500.00	500.00	450.00	1950.00
2	Infrastructural facilities	15.00	15.00	15.00	13.50	58.50
3	Vehicle	50.00	50.00	50.00	45.00	195.00
	<b>TOTAL</b>	<b>565.00</b>	<b>565.00</b>	<b>565.00</b>	<b>508.50</b>	<b>2203.50</b>

**Recurring expenditure**

Sl. no.	Component	2008-09 (10)	2009-10 (10)	2010-11 (10)	2011-12 (9)	TOTAL (39)
1	Remuneration to vet (4) @ Rs.25000/- per month to each	120.00	120.00	120.00	108.00	468.00
2	Remuneration to Para vets (4) @ Rs.8000/- per month to each	38.40	38.40	38.40	34.56	149.76
3	Remuneration to 4 <sup>th</sup> grade (4) @ Rs.5000/- per month to each	24.00	24.00	24.00	21.60	93.60
4	Remuneration to driver (1) @ Rs.5000/- per month	06.00	06.00	06.00	5.40	23.40
5	Fuel 100 litres / month @ Rs.40/ litre	4.80	4.80	4.80	4.32	18.72
6	Miscellaneous @ Rs.0.25 lacs / year	1.80	1.80	1.80	1.62	7.02
7	<b>TOTAL</b>	<b>195.00</b>	<b>195.00</b>	<b>195.00</b>	<b>175.50</b>	<b>760.50</b>
	<b>GRAND TOTAL</b>	<b>760.00</b>	<b>760.00</b>	<b>760.00</b>	<b>684.00</b>	<b>3648.00</b>

## Bihar Livestock Development Agency (BLDA)

BLDA is a registered agency of Animal Husbandry Sector which deals with the A.H. Developmental activities particularly in terms of Animal Breeding. The establishment cost is borne by State Government where as the expenditure on work is borne by Government of India. At present the agency is implementing the National Project of Cattle and Buffalo Breeding (NPCBB) Programme, a hundred percent centrally sponsored scheme.

### Objective

To enhance the Livestock Production by Animal Breeding Programme.

### Work Component :

- To establish A.I. networking in the State.
- To establish the frozen semen bank & production of quality frozen semen straws
- To provide A.I. facilities at A.I. centres & Door-step-animal owner.
- To conserve & preserve the native breed of livestock.
- To implement the Bihar Breeding policy as mandatory for department & for other organization engaged with A.I. work.
- To implement the National Cattle Insurance Programme.

### Present Status :

The state received only a meager amount of Rs. 4.998 crore from GOI against the estimated amount of Rs. 61.45 crore. The State could not avail the facilities as par with other states in the country during 10<sup>th</sup> Five Year Plan Period. The work has now started with the amount of Rs. 4.998 crore. The Project under II<sup>nd</sup> Phase under NPCBB has been presented before GOI for their kind approval. The total estimated cost for the second phase prepared from BLDA is of Rs. 111.00 crore.

The department is in view to promote & potentiate the workings of BLDA under NPCBB Programme & hence, the cost has not been included in this Road Map.

### Cattle Insurance Scheme

The state is implementing the National Cattle Insurance Scheme on pilot basis in 5 districts in Bihar (Patna, Rohtas, Samastipur, Muzaffarpur & Begusarai). The scheme requires to be expanded for rest 33 districts in State. The guide line of GOI under which the pilot scheme is going on, will be followed here also. Only the lactating cows & buffaloes will be covered under this scheme with an annual premium rate of 4.5%. Half of the premium amount will be borne by the beneficiaries themselves & rest of the amount will be as an assistance from government sector.

( Figure in Lakh )

1.	Projected no. of lactating cows & buffaloes in 33 district of state with an annual increase of 3% of Cattle Census 2003	16.00
2.	Targetted no. of Cattle & Buffaloes for insurance (50% in beginning with 10% annual increase)	8.00
3.	Half of Premium amount @ 4.5% of animal cost value ( on average 20,000) i..e. Rs. 450	—
4.	Total Cost	3600.00

### Year wise Projection of Cattle Insurance Scheme

( Rs. In Lakh)

Sl. No.	Year	No. of Animals to be insured (Lakh)	Amount
1.	2008 - 09	8.00 ( 50% of total)	3600.00
2.	2009 - 10	10.00 (60% of total)	4500.00
3.	2010-11	12.00 (70% of total)	5400.00
4.	2011 - 12	14.00 (80% of total )	6300.00
		Total	19800.00

### Monitoring of Different Programmes under Road Map

Monitoring Committees will be formed at district & state level for regular reviewing of the progress made under Road Map Programme. The Committee will be headed by Departmental Principal Secretary or the officer authorized by him at state level & by D.A.H.O. at district level. As per the requirement the programme may be changed in mid term evaluation.

#### Summary

#### Yearwise Expenditure of different Programmes (Rs. In Lakhs)

Sl. No.	Component	2008-09 *	2009-10	2010-11	2011-12	Total
1	Doorstep Vety. Service	6836.00	6836.00	7246.16	7246.16	28164.32
2	Door to door vaccination	6298.00	6909.00	7520.00	8178.00	28905.00
3	Goat Dev.	211.71	128.71	136.46	136.36	613.24
4	Buffalo Dev.	75.00	36.00	39.50	44.00	194.50
5	Poultry farm	261.00	374.00	224.00	257.00	1116.00
6	Strengthening of A.H. Offices	34.48 (RD & DAHO)	38.85 (SDAHO)	—	—	73.36
7	Extention coverage & knowledge dissemination	23.28	20.00	20.00	20.00	83.28
8	Strength. of sub-divisional level Vet. Hosp.	760.00	760.00	760.00	684.00	3648.00
9	Cattle insurance	3600.00	4500.00	5400.00	6300.00	19800.00
	<b>TOTAL</b>	18099.47	19602.56	21346.12	22865.52	82597.70

\* The Plan Allocation for the year 2008 - 09 is Rs. - 1282.90 lakh approved by Department of Planning and Development, Bihar, Patna. The rest amount will require supplementary assistance from R.I.D.F., R.K.V.Y. A.C.A, ASCAD & state Plan.

# **ROAD MAP FOR DAIRY DEVELOPMENT**

## 16. DAIRY DEVELOPMENT

**16.1 Introduction:** With the bifurcation of Bihar, mineral resources have gone to Jharkhand and so have gone the limited industrial establishments unified Bihar had. There has been a shift in the contribution by different sectors to the State Gross Domestic Product (SGDP) - contribution of industries decreasing from 20 to 12% and that of agriculture sector increasing from 32 to 39%. In 2003-04, the Agriculture sector contributed around 35% to the SGDP of Bihar of which the contribution from the livestock sector accounted for approximately one-quarter. Milk is the most important livestock product at 50 percent of total livestock output. Milk sector contributed around 70% of the total livestock sector.

Bihar's livestock wealth is around 5.6 percent of total national livestock population. In 2005-06, total production of milk was estimated to be 5060 thousand tons, which amounted to 5.2% of the national milk production and the State ranked tenth in the country despite the fact that it is endowed with good natural resources like water and very fertile Gangetic alluvial land, implying low productivity of animals.

Per capita availability of milk in Bihar during 2005-06 was 154<sup>1</sup> gms per day against a national average of 241 gms per day. The Indian Council of Medical Research has recommended the minimum requirement of 220<sup>2</sup> gms of milk per person per day indicating a shortage of around 66 gms per capita.

Of the total milk production (138.0) lakh kgs. per day as per 2005-06 estimates), the cooperative sector handled around 8% of the marketable surplus available. Rest of it was traded mainly by the un-organised sector. But huge potential exists in this sector, which is yet to be exploited. The compounded annual growth rate (CAGR) of milk handled by the cooperative sector is around 13%. Therefore till 2012 the target for milk production has been estimated to be 172 lakh kgs. per day.

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<sup>1</sup> Annual Report of Dept. of AH & Dairying, Min. of Agriculture for 2005-06, GOI; pp 8,28

<sup>2</sup> Dairy India 2007, Sixth edition, pp 27

Central Govt. and NDDDB also envisages that milk production in Bihar by the year 2022 would reach 247 lakh kgs. per day.

**16.2 Present status of Dairying in the State:** Around 6200 dairy cooperative societies (DCS) covering about 7750 villages (19.5% of inhabited villages in Bihar) have been formed in twenty-eight districts. Five milk unions established at the district level are covering twenty-four districts. Compfed is organising the dairy cooperatives in two milk-sheds directly, viz. Gaya milk-shed, which is covering Gaya & Jehanabad districts, and Bhagalpur milk-shed that is covering Bhagalpur and some parts of Munger districts. Besides the Dairy Directorate is doing the dairy development work in Purnia, Araria, Katihar, Kishanganj, Gopalganj, Sitamarhi, Aurangabad, Munger, Nalanda, Chapra, Siwan, Supaul, Madhepura, Banka, Jamui, Lakhisarai, Nawada, Sheikhpura, Arwal and Patna districts. Three lakh four thousand milk producer families are associated with the dairy cooperatives. The percentage of women farmers is approximately 14.7% of total farmers. Milk Procurement over the years is registering a linear growth. It averaged 6.09 lakh kgs. per day (TKPD) in 2006-07. Average pouring by each farmer is roughly two kgs. per day. The devastating floods from July to September 2007 have affected the milksheds and milk production/procurement. The milk procurement, which had reached 6.50 lakh kgs. per day in July 2007, has not been able to regain the pre-flood level.

**16.3 Animal Input Programmes:** The milk unions and the milk-sheds provide the milk production enhancement inputs to the milk producers on cost basis, resume of each of the inputs is given hereunder:

**16.3.1 Breeding Facility:** Two thousand seven hundred and one AI centres had been established covering 4000 DCS. The farmers have to pay a service charge for the facility at their doorstep.

**16.3.2 Animal Health Care:** Under animal health cover, prophylactic inoculations against diseases like FMD, HS & BQ are done by the Animal & Fish resources Department in the Animal Health Fortnight and Compfed/milk unions. Presently there

are 853 veterinary hospitals. Panchayat level camps are organised for examination of animals and vaccination thereof. During 2007-08, the Vaccination fortnights have been organised twice and 66.95 lakh animals were vaccinated till January 2008 which is proposed to be increased to four times by 2012.

Besides this, under the clean milk production programme, screening of animals against mastitis is done and accordingly treatment is done. As preventive measure, farmers are educated and supplied with Saaf kits.

**16.3.3 Animal Nutrition:** Under this programme, farmers are supplied balanced cattle feed produced at cattle feed plants at Patna, Ranchi and Kanti (Muzaffarpur) - total production capacity is 260 MTs per day. On an average, 45.0 to 46.0 thousand MTs of feed is produced every year and 46.0 thousand MTs of feed is supplied to the dairy cooperatives and balance to the Govt. farms and private dealers.

Fodder seeds are provided to the farmers on cost. Production of fodder seeds has been taken up in three milk unions. To mitigate the gap between demand and production, the milk unions procure seeds from unions under National Seed Grid. On an average 300 MTs of seeds are sold to the farmers.

Programme of 'treatment of straw with urea' is implemented by all the milk unions. Around 5190 MTs of straw has been treated during 2006-07 and during 2007-08, quantity of straw treated was 5900 MTs.

**16.3.4 Training:** Compfed had established one training centre way back in 1985 under Operation Flood. The lodging and boarding capacity is ninety participants. Five types of programmes viz. Secretaries training for society operation (26 days), Orientation of management committee members (3 days), AI training (40 days), AI & VFA training (10 days) are held on regular basis. So far around 40675 persons have been trained of which women trainees were 24%. During 2007-08, so far 3000 farmers have been trained.

**16.4 Infra-structure:** In Bihar, there are 10 dairy plants having 6.35 lakh litres processing capacity besides additional chilling capacity of 2.42 lakh litres per day in 8 milk chilling centres and ten bulk coolers. Most of the dairies in Bihar are ISO/HACCP certified. For conserving additional milk solids there is a powder plant of 10 metric ton per day capacity at Barauni. Two new powder plants - one at Biharsharif having a capacity of 30 MT/day and another at Muzaffarpur having a capacity of 10 MT/day are being established with financial assistance from the State Govt. and Rural Dev. Ministry respectively. In Patna an icecream plant of 3000 litres per day capacity is also established.

**16.5 Marketing:** Around 5.50 lakh litres milk is marketed by all the dairies in 85 cities and towns in Bihar and Jharkhand besides in Varanasi and Calcutta through a network of 7200 outlets. Five types of milk in three types of packing (1000 ml, 500 ml and 200 ml poly pouches having Mnemonic symbol) and twenty-four milk producers including value added products like ghee, table butter and ice cream are marketed under 'Sudha' brand. Due to marketing management by Compfed, the people at Bihar and Jharkhand are getting the packed milk and quality milk products at reasonable rates.

**16.6 Roadmap 2008-2012:** For the economic benefit of the rural farmers of Bihar and keeping in view the health of consumers and also for different income generation avenues through animal husbandry and dairy development a road map for 2012 has been prepared, the execution of which will contribute significantly to the State GDP.

Sl.No.	Particulars	Present Status	2012
1	Milk Production	138.00 lakh kgs/day	172.00 lakh kgs/day@
2	Processing Capacity (Co-operative)	6.35 lakh ltr/day	16.35 lakh ltr/day
3	Milk Procurement(Co-op.)	6.0 lakh kgs/day	12.00 lakh kgs/day
4	Milk Marketing(Co-op.)	6.0 lakh ltr/day	9.0 lakh ltr/day
5	Per capita milk availability/day	154 gm	161 gm
6	Artificial Insemination centres	2701	Cent percent at the farmers door
7	Vaccination	66.95 lakh	Cent percent
8	Fodder/Cattlefeed Production	260 MT/day*	560 MT/day
9	Fodder Block Making Unit	0	14+100**
10	Farm Management, Society Operation and Artificial Insemination Training to farmers	3000 (Year 2007-08)	80866 till 2012

@ As per estimates of GOI and NDDB, the milk production will increase to 247.00 lakh kgs per day in 2022

\* One plant of 100 MTD is established at Ranchi.

\*\* 14 units by State Govt. and Compfed level and 100 units by entrepreneurs.

**16.7 Strategies:** The main strategies will be in line with the national plan and based on the past experience as detailed below :

**16.7.1 Increasing the productivity of milch animals:** The productivity of milch animals is proposed to be increased through:

#### 16.7.2 Expansion of AI programme

- The existing milch animals will be improved genetically so that more milk can be produced. The programme is presently limited to 4000 dairy cooperatives. Some NGOs/organisations, namely BAIF, JK Trust, Indigen besides private agency and State Govt. are also running around 2701 AI centres which are not included in the above numbers. The AI facility will be extended to all the villages at the farmers' door-steps .

- Infra-structure is proposed to be created for the procurement, storage and distribution of liquid nitrogen (LN). It is proposed to set up three storage tanks of 3000 litres capacity besides adding one LN tanker of 10,000 L capacity to the existing fleet of tankers. Thus by 2012, One LN tank will be established in each of the milk unions at Barauni, Muzaffarpur, Samastipur, Arrah and Patna.
- It is also proposed to establish fifty breeding units by the progressive farmers in all the milk sheds so as to be self-sufficient in good crossbreds. The AI facility has been planned to be provided to the farmers at their door-steps.

## 16.8 Animal Health Coverage

16.8.1 Productivity is affected very much due to poor health of milch animals. Animals need to be protected against several disease of economic importance, viz. Foot & Mouth Disease (FMD), Hemorrhagic Septicemia (HS) and Black Quarter (BQ). Till January 2008, around 66.95 lakh animals were vaccinated which is proposed to be increased by four times till 2012.

The Animal Resources Department also has been organising mass vaccination camps for the last two seasons giving immunity to the milch animals in all the panchyats.

16.8.2 Mastitis is another disease of economic importance to the farmers, especially the owners of crossbreds. Screening and treatment of clinical and sub-clinical cases is proposed to be continued extensively in DCS besides creating awareness amongst the farmers about the disease and control thereof.

16.8.3 With a view to provide the services at the door-steps of the farmers, it is proposed to start veterinary routes and provide one mobile clinic unit to each milk union/milk shed.

16.8.4 It is proposed to set up one disease investigation laboratory at each of the milk union/milk shed where the pathological samples will be tested for better diagnosis and treatment of animals.

**16.9 Animal Nutrition:** Potential of the genetically better milch animals cannot be exploited fully unless they are fed adequately both in terms of quality and quantity. Feeding of animals is also important because around 70 percent of the cost of production depends up on the cost of feeding. Both the balanced cattle feed and green fodder have equally significant role in the animal nutrition.

**16.9.1 Cattle Feed:** Cattle feed requirement of dairy cooperatives is expected to be 109.5 thousand MTs annually based on the projected milk procurement of 12.0 lakh kgs. per day. This will necessitate increasing the production capacity of cattle feed plants by around 100 MTs per day. Existing installed capacities of three plants is 260 MTs per day.

It is therefore, proposed to expand the capacity of Patna plant from 100 to 150 MTs per day, of Muz S affarpur plant by 50 M.T. and establish new cattle feed plants of 100 MTs at Vaishali & Barauni and 50 MTs at Samastipur & Munger.

**16.9.2 Fodder:**

- Feeding of green fodder helps not only in reducing the intake of concentrates and in turn the cost of production but also in meeting the requirement of feed in terms of providing desired nutrients and quantity. Presently, cultivation of fodders exclusively for feeding the animals is not very much popular with the farmers mainly due to pressure on land for growing grains for human consumption. Availability of good fodder seeds is also another reason for slow progress in this area. Dairy cooperatives have been able to generate a demand of around 300 MTs of seeds annually. By 2012, it is proposed to double the sale of fodder seeds to the farmers.

- Presently there is no fodder seeds processing unit in the cooperative sector and they have to depend up on the facilities in the private sector. It is proposed to establish a fodder seeds processing unit at Samastipur.
- Dry fodder fed to the animals is nutritionally poor. Treatment of straw with urea (ammonification) helps in improving its nutritive value. The technology also helps in reducing the cost of production of milk. Farmers in the dairy cooperatives have started adopting the technology and presently around 6000 MTs of straw is treated with urea. The quantity of treated straw is proposed to be doubled till the end of Plan period.
- During floods and drought, availability of green/dry fodder gets reduced and it becomes scarce, which leads to malnutrition. This affects the productivity of animals significantly. Hence, it has been proposed to establish 14 fodder brick making units for densification of dry fodder when it is available. Out of this 6 units will be established by Compfed at milk union level and eight units will be established by Animal Husbandry Department. In lean season, green fodder will be preserved as silage. Establishment of 4000 fodder demonstration units of 0.25 acre each at the farmers' field jointly by the Dairy Directorate and Compfed.

**16.10 Manpower development:** To improve the productivity of milch cattle the key areas and subjects identified for professional and modern training are - better upkeep and management of animals, breed management, green fodder production, improving the nutritive value of dry fodder, artificial insemination and first aid etc. Training institutes at NDDDB Siliguri, NDRI Karnal and Compfed Training Centre have been identified for imparting training to farmers from Bihar.

The dairy cooperatives at the village as well as at the union level are being managed by the milk producers themselves. Similarly, the input services are being provided by the local youths in the villages. Day to day operation of a DCS is done by the secretary who is also picked up from the village itself where a DCS has been formed. Skill up-gradation of farmers and staff of the DCS is done at the training

centre at Compfed, Patna and training centres at the milk unions. So far around 40675 persons have been trained of which women trainees were 24%. During 2007-08, so far 3000 farmers have been trained.

The training centre at Patna has lodging and boarding facilities for ninety participants at a time. It is proposed to make it a state level training institute to cater to the training needs of milk unions/DRDAs. It is proposed to enhance the capacity of this centre to 200 participants. In addition to its capacity of training centre at Barauni will be enhanced from 20-50. The training programmes organized in Compfed training centre are - DCS management ( 26 days ), Management Committee Orientation ( 3 days ), AI ( 40 days ) and Animal Management. Till date 40675 farmers have been trained . In 2007-08 alone 3000 farmers have been imparted training and by the year 2012 at least 80866 additional milk producing farmers would be targeted for training.

#### **16.11 Creation/strengthening the infra-structure required for milk processing:**

By 2012 it has been envisioned to procure on an average 12.00 lakh kgs. of milk every day which would mean a peak procurement of around 16.75 lakh kgs. Hence, the processing capacities will have to be created to handle 16.35 lakh litres of milk. Actions have already been initiated to double the existing capacities in coming two years from 6.35 lakh litres/day to 12.95 lakh litres/day. Details are tabulated hereunder.

<b>SN</b>	<b>Plant</b>	<b>Existing Capacity (LLPD)</b>	<b>Additional Capacity (LLPD)</b>	<b>Total Capacity (LLPD)</b>	<b>Source of fund</b>	<b>Project cost (Rs. Cr.)</b>	<b>Completion time (Months)</b>
1.	Patna	1.50	-	1.50	NCDC	5.16	12
2.	Muzaffarpur	1.00	0.50	1.50	NCDC	9.95	12
3.	Samastipur	1.00	1.00	2.00	NCDC	10.94	24
4.	Biharsharif	-	4.00	4.00	State Govt.	120.93	24
5.	Hajipur	-	1.00	1.00	Rural Dev.	12.44	24
6.	Barauni	1.60	1.40	3.00	-	-	-
7.	Arrah	0.60	-	0.60	-	-	-
8.	Bhagalpur	0.25	-	0.25	-	-	-
9.	Gaya	0.20	-	0.20	-	-	-
10.	Kaimur	0.10	-	0.10	-	-	-
11.	Purnia	0.10	-	0.10	-	-	-
12.	Gopalganj	-	0.10	0.10	-	-	-
13.	Mohania	-	2.00	2.00	-	-	-
		<b>6.35</b>	<b>10.00</b>	<b>16.35</b>	-	-	-

Legend : LLPD - lakh litres per day; NCDC - National Coop. Development Corporation

Proposal for the expansion of Barauni dairy from 1.60 lakh litres per day to 3.0 lakh litres per day is being revised for seeking financial assistance from Rashtriya Krishi Vikas Yojana /NCDC which would increase the capacity to 14.35 lakh litres/day. Balance 2.15 lakh litres capacity will be required additionally to process all the milk expected to be procured in 2012. Hence, one new dairy plant of 2.0 lakh litres per day capacity is proposed to be established at Mohania thus increasing the total

capacity to 16.35 lakh litres per day. In addition to it a new Dairy plant of 1.0 lakh ltr per day capacity will be established at Dehri-on-sone.

For value addition, it is proposed to expand/strengthen/mechanize the production capacity of fresh milk products facilities. Further, with a view to enlarge the product mix, it has been targeted to establish a cheese plant of 1.0 MT per day capacity at an estimated cost of Rs. 2.471 crores at Dehri-on-sone. The plant will be mainly producing Mozzarella cheese from buffalo milk and the Processed cheese.

With the consumers becoming more and more cautious about the quality of product they are consuming, it is inevitable to produce the products which not only meet the national and international quality standards but are safe also to consume. The quality of the finished product depends up on the quality of raw material. It has been felt necessary to give thrust to the quality of raw milk and for this programme of clean milk production will continue to be implemented during the eleventh Plan period. Awareness about importance of good quality milk through extension and communication campaigns will be created amongst the milk producers. These campaigns will be coupled with price incentive for bacteriological good quality milk free of any adulterant.

It has been proposed to establish 242 bulk coolers at strategic locations, thereby reducing the sourage of milk. All the bulk coolers will be able to handle about 20 percent of milk procured by the dairy cooperatives in 2012.

For continual improvement in the quality of products in terms of their shelf-life, attractive and suitable packaging, developing new products, research and development (R & D) activity is proposed to be taken up.

The existing dairy and chilling plants are very old and require refurbishing so as to meet the M&MPO and ISO/HACCP requirement. It is proposed to renovate these plants suitably.

**16.12 Expansion of geographical area of dairy cooperatives:** In order to achieve the projected milk procurement by the dairy cooperatives, it is inevitable to expand the dairy cooperative net-work in the existing blocks/milk routes and also in other blocks. It is proposed to establish 5600 new dairy cooperatives thereby increasing the number of dairy cooperatives from 6200 to 11800.

Necessary milk testing equipments, electronic milkotester for more transparency in the operations, SS milk cans are proposed to be provided to all the DCS. It is also proposed to establish automatic milk collection units at 695 DCS in all the milksheds which are pouring more than 500 kgs. of milk everyday. Electronic milkotesters will be provided in 20% of the DCS which are having more than sixty members.

**16.13 Forward linkage/market development:** It has been planned to market around 8.00 lakh litres of milk in pouches, aseptic paper cartons and in the form of milk products by deepening the market penetration, improving the infra-structure for marketing. Other strategies for marketing would be reaching close to the consumers, redressal of their complains, developing products as per the demand/requirement of consumers as per the findings of market research. Creating consumer awareness and education programme, pricing policy will also be the part of marketing approach.

It is proposed to increase the number of market out-lets from 7150 to 12225 by 2012. The number of whole day booths is proposed to be increased from 500 to 902 with required facilities for cold chain.

It is also proposed to provide cold chain facilities, e.g. visicoolers/deep freezers to the existing whole-day booths/retailers

Presently the milk is being marketed in eighty-five cities/towns in Bihar and neighbouring states. By 2012, it is proposed to add fifteen more cities/towns to cover one hundred cities/towns. Emphasis in liquid milk marketing will be on the rural markets as demand elasticity for milk in the rural areas has been estimated to be 2.4.

**16.14 Schemes of Dairy Directorate :** Compfed is operating in 28 districts of Bihar while in the remaining 10 districts, namely Chapra, Siwan, Supaul, Madhepura, Banka, Jamui, Lakhisarai, Nawada, Sheikhpura, Arwal, the dairy development work is being carried out by the Dairy Directorate. In some of the districts like Purnia, Araria, Katihar, Kishanganj, Gopalganj, Sitamarhi, Aurangabad, Munger, Nalanda and Patna both the Dairy Directorate and Compfed are operating jointly. The following schemes are being implemented by the Dairy Directorate :

**16.14.1 Mini Dairy Scheme :** Under this scheme financial assistance is provided to the progressive farmers, educated unemployed youth, small and marginal farmers with a view to create self employment and income generation avenues for them. Five cross bred cow are provided under this scheme. The cost of setting up of a mini-dairy is approximately Rs.1,00,950.00 out of which Rs. 80,000.00 are provided as bank loan and remaining Rs. 20,950.00 as grant. This scheme is benefiting the farmers to increase cross-bred animal population and also the milk production leading to their economic prosperity.

**16.14.2 Dairy Science Training Scheme :** Keeping in view the less productivity in milch animals and with a view to provide the farmers (milk producers) with exposure of the best practices followed in dairying and animal Husbandry, the farmers are trained outside the state at NDDB Siliguri, NDRI Karnal and within the state at Compfed's training centre. Subjects like on dairy animal management, fodder cultivation, improving the nutrition value of dry fodder with urea, artificial insemination, first aid. The training programme helps the farmers to learn and adopt the latest techniques of animal husbandry and dairying.

**16.14.3 Green Fodder Demonstration Scheme :** Demonstration on the farmers plots of cultivating green fodder are carried out in Rabi and Kharif seasons. This programme helps the farmers to cultivate the ideal fodder crops which help them directly to increase milk production and reduce the cost of milk production. Certified seeds are

provided to the beneficiaries mostly of dairy cooperative societies to demonstrate green fodder at the farms (plots of farmers). In winter, Barseen and Oat seeds are provided to the farmers, while in summer, Sorghum and Maize seeds are provided. For green fodder demonstration, the farmers are provided Rs. 1600.00 per plot as grant.

**16.14.4 Scheme of Model Dairy Gram :** Under this scheme group of five villages are selected to form a gram. It is targeted to be developed into an ideal dairy village with community building, artificial insemination- cum- first aid centre, equipped with milk testing equipments and a 1000 litres capacity bulk cooler to chill the milk procured from the model gram. The present estimated cost to set up such a model dairy gram is about Rs. eighteen lakhs.

**16.14.5 Scheme to construct milk collection centre and provide electronic milko-tester at dairy co-operative society level:** Under this scheme such societies are selected where 200 litres of milk is collected every day and the society is registered. The milk collection centre is constructed where the society has available land. The society is provided with electronic milko-tester. For setting up such a unit, the estimated cost is Rs. four lakhs.

**16.14.6 Scheme to set up Cattle Breeding Centre:** Keeping in view the scarcity of cross-bred milch animals in the State, it is proposed to set up cattle breeding farms for the rural unemployed and progressive farmers. For setting up a cattle breeding centre, the estimated cost is Rs. four lakhs. The beneficiary has to provide 10% of the amount initially as seed money. Of the balance amount, 80% of the cost is financed by the banks as loan and the remaining 20% is provided as grant the State Govt.

**16.14.7 Scheme for Clean Milk Production:** The main objective of the scheme is to bring about qualitative improvement in the quality of milk at milk producers' level. Training is provided to the milk producers to make use of stainless steel pails, strainers, stainless steel cans and use of sanitizers for clean milk production. The scheme is implemented at dairy cooperatives level.

16.14.8 **Rashtriya Krishi Vikas Yojana:** This scheme is being implemented from the current financial year under the State Plan. Under the scheme all the districts of the State are being covered. The implementation of the scheme is being done jointly by Compfed and the Dairy Directorate in the pre-decided areas.

During the year 2007-08, following schemes viz. organisation of self help group/ dairy cooperative societies, providing of AI facilities, training, establishment of fodder block making units, establishment of automatic milk collection centres, expansion of capacities of existing plant are being implemented.

16.15 **Fund Requirement and source of funding:** Fund requirement for all the above mentioned activities to be undertaken by Compfed and the State Dairy Directorate at the existing rates has been estimated to be Rs. 471.78 crores to complete all the above listed schemes up to 2012. Scheme-wise break-up of estimated cost is given here under :

<u>Scheme</u>	<u>Funds (Rs. in crores)</u>
Organisation of dairy cooperative societies	- 25.79
Breed improvement	- 92.35
Animal Health Care	- 10.23
Animal Nutrition	- 80.58
Manpower Development	- 8.68
Processing & Marketing Infrastructure	-254.15
<b>Total</b>	<b><u>471.78</u></b>

Funds for the above scheme will be sourced from the Bihar Government, Rashtriya Krishi Vikas Yojana (RKVY), Compfed's own resources, SGSY, RSVY or taking loan from NDC. Activity-wise physical and financial requirement for the period 2008 to 2012 has been depicted in annexure - 1.

**Physical Targets for Dairy Development in Bihar : 2008-12**

Name of District : Total

S N	Activity	Basic Rate	Year				
			2008-09	2009-10	2010-11	2011-12	Total
1	2	3					
<b>I</b>	<b><u>DCS organisation</u></b>						
1	Establishment of DCS	0.20	1133	1307	1476	1684	5600
2	Electronic Milkotester	0.28	905	1046	1183	1348	4482
<b>II</b>	<b><u>Breed Improvement</u></b>						
3	Establishment of AI Centres	0.42	251	313	357	425	1346
4	LN Storage/Distribution System	15.00	1	1	1	0	3
5	LN tanker	40.00	0	0	1	0	1
6	Establishment of information system for AI	6.00	1	0	0	0	1
7	Estd. of Adarsh Gram	18.00	60	60	81	81	282
8	Estd. of Mini dairy-Total Cost	1.00	622	733	862	976	3193
	Estd. of Mini dairy-Subsidy	0.20	622	733	862	976	3193
<b>III</b>	<b><u>Animal Health</u></b>						
9	Mobile veterinary routes / Setting up of Disease Investigation Lab.	5.00	7	0	0	0	7
10	Estd. Breeding units-Total Cost	4.00	50	52	63	63	228
	Estd. Breeding units-Subsidy	0.80	50	52	63	63	228
<b>IV</b>	<b><u>Animal Nutrition</u></b>						
11	Expansion of Cattlefeed plant	500.00	1	1	0	0	2
12	Estd. of new Cattle Feed Plant-100/50 MTD	1500.00	0	2	1	1	4
13	Estd. of Formaldehyde plant	90.00	0	2	2	1	5
14	Estd. of Mineral Mixtuere plant	15.00	1	1	0	0	2
15	Estd. Fodder Seed Processing plant	55.00	0	1	0	0	1
16	Estd. of fodder block making units	25.00	3	3	1	0	7
	Estd. Of Fodder Block Making Units-PPP	6.50	30	30	40	0	100
	Estd. Of Fod.BI.Making Unit-PPP Subsidy	1.30	30	30	40	0	100
17	Ration Balancing Scheme		17	27	26	32	102
18	Estd. of fodder demonstration units	0.016	1279	1492	1812	2044	6627
<b>V</b>	<b><u>Manpower Development</u></b>						
19	Capacity enhancement of Training Centre	75.00	1	1	0	0	2
20	Training of farmers for society organisation	0.052	1133	1307	1476	1684	5600
21	Training of farmers for AI	0.080	251	313	357	425	1346
22	Study tour of farmers	0.028	1532	1868	2192	2528	8120
23	Awareness programme for milk producers	0.001	12220	14617	17766	21197	65800
<b>VI</b>	<b><u>Processing Infra-structure</u></b>						
24	Estd. of R&D Lab	300.00	0	1	0	0	1
25	Estd. of Bulk Coolers	23.00	47	53	61	81	242
26	Estd. of new dairy plant	1500.00	4	0	1	1	6
27	Refurbishing of existing dairy plants	300.00	2	5	0	0	7

28	Estd. of auto milk collection centres	2.00	119	161	188	227	695
29	Refrigerated van	20.00	1	2	3	3	9
30	Whole day booths with insulated box and Deep freezers	2.50	75	87	104	136	402
31	Walk-in-cold stores	9.00	11	12	11	13	47
32	Cold chain (visicoolers/deep freezers)	0.20	136	176	213	254	779
33	ERP	100.00	2	3	0	0	5
<b>Total</b>							

**Financial Targets for Dairy Development in Bihar : 2008-12**

Name of District : Total

S N	Activity	Basic Rate	Year				Total
			2008-09	2009-10	2010-11	2011-12	
1	2	3					
<b>I</b>	<b><u>DCS organisation</u></b>						
1	Establishment of DCS	0.20	226.60	274.47	325.46	389.89	1216.42
2	Electronic Milkotester	0.28	253.40	307.52	365.19	436.93	1363.05
<b>II</b>	<b><u>Breed Improvement</u></b>						
3	Establishment of AI Centres	0.42	105.42	138.03	165.31	206.64	615.40
4	LN Storage/Distribution System	15.00	15.00	15.75	16.54	0.00	47.29
5	LN tanker	40.00	0.00	0.00	44.10	0.00	44.10
6	Establishment of information system for AI	6.00	6.00	0.00	0.00	0.00	6.00
7	Estd. of Adarsh Gram	18.00	990.00	1039.50	1473.49	1547.17	5050.16
8	Estd. of Mini dairy-Total Cost	1.00	622.00	769.65	950.36	1129.84	3471.85
	Estd. of Mini dairy-Subsidy	0.20	124.40	153.93	190.07	225.98	694.38
<b>III</b>	<b><u>Animal Health</u></b>						
9	Mobile veterinary routes / Setting up of Disease Investigation Lab.	5.00	35.00	0.00	0.00	0.00	35.00
10	Estd. Breeding units-Total Cost	4.00	200.00	218.40	277.83	291.72	987.95
	Estd. Breeding units-Subsidy	0.80	40.00	43.68	55.57	58.35	197.60
<b>IV</b>	<b><u>Animal Nutrition</u></b>						
11	Expansion of Cattlefeed plant	500.00	200.00	510.00	315.00	0.00	1025.00
12	Estd. of new Cattle Feed Plant-100/50 MTD	1500.00	0.00	1050.00	2236.50	2149.88	5436.38
13	Estd. of Formaldehyde plant	90.00	0.00	189.00	198.45	104.19	491.64
14	Estd. of Mineral Mixtuere plant	15.00	15.00	15.75	0.00	0.00	30.75
15	Estd. Fodder Seed Processing plant	55.00	0.00	57.75	0.00	0.00	57.75
16	Estd. of fodder block making units	25.00	75.00	78.75	27.56	0.00	181.31
	Estd. Of Fodder Block Making Units-PPP	6.50	195.00	204.75	286.65	0.00	686.40
	Estd. Of Fod.BI.Making Unit-PPP Subsidy	1.30	39.00	41.10	57.22	0.00	137.32
17	Ration Balancing Scheme		5.10	8.51	8.60	11.11	33.32

18	Estd. of fodder demonstration units	0.016	20.46	25.07	31.96	37.86	115.35
<b>V</b>	<b><u>Manpower Development</u></b>						
19	Capacity enhancement of Training Centre	75.00	75.00	40.00	0.00	0.00	115.00
20	Training of farmers for society organisation	0.052	58.92	71.36	84.62	101.37	316.27
21	Training of farmers for AI	0.080	20.08	26.29	31.49	39.36	117.22
22	Study tour of farmers	0.028	42.90	54.92	67.67	81.94	247.42
23	Awareness programme for milk producers	0.001	13.44	16.08	19.54	23.32	72.38
<b>VI</b>	<b><u>Processing Infra-structure</u></b>						
24	Estd. of R&D Lab	300.00	0.00	315.00	0.00	0.00	315.00
25	Estd. of Bulk Coolers	23.00	1081.00	1279.95	1546.81	2156.66	6064.41
26	Estd. of new dairy plant	1500.00	5893.00	2700.00	992.25	2397.94	11983.19
27	Refurbishing of existing dairy plants	300.00	450.00	900.00	825.00	0.00	2175.00
28	Estd. of auto milk collection centres	2.00	238.00	338.10	414.54	525.56	1516.20
29	Refrigerated van	20.00	20.00	42.00	66.15	69.46	197.61
30	Whole day booths with insulated box and Deep freezes	2.50	187.50	228.38	286.65	393.59	1096.12
31	Walk-in-cold stores	9.00	99.00	113.40	109.15	135.44	456.99
32	Cold chain (visicoolers/deep freezes)	0.20	27.20	36.96	46.97	58.81	169.93
33	ERP	100.00	200.00	315.00	0.00	0.00	515.00
			227.41	227.60	224.26	245.77	925.04
	<b>Total</b>		<b>11597.43</b>	<b>11607.93</b>	<b>11438.09</b>	<b>12534.44</b>	<b>47177.89</b>

Note: The rate shown in column 3 is the basic rate for first year. It has been increased @5% in subsequent years.

**Total Financial Requirement and Tentative Sources of Funding the schemes during 2008-09**

(Rs. in lakhs)

S N	Schemes	Rate  (Rs. in Lakhs)	Quantity  (Nos.)	Total	Sources of Funding the schemes						
					State Plan	RKVY	Central schemes	Compfed/ Unions	Institutional Finance	PPP/Margin Money	Total
1	2	3	4	5	6	7	8	9	10	11	12
<b>I</b>	<b><u>DCS organisation</u></b>										
1	Establishment of DCS	0.20	1133	226.60	47.40	143.36	26.88	8.96			<b>226.60</b>
2	Electronic Milkotester	0.28	905	253.40	53.20	160.16	29.96	10.08			<b>253.40</b>
<b>II</b>	<b><u>Breed Improvement</u></b>										
3	Establishment of AI Centres	0.42	251	105.42	26.46	63.42	11.76	3.78			<b>105.42</b>
4	LN Storage/Distribution System	15.00	1	15.00		15.00	0.00	0.00			<b>15.00</b>
5	LN tanker	40.00	0	0.00		0.00	0.00	0.00			<b>0.00</b>
6	Establishment of information system for AI	6.00	1	6.00		6.00	0.00	0.00			<b>6.00</b>
7	Estd. of Adarsh Gram	16.50	60	990.00	66.00	726.00	198.00				<b>990.00</b>
8	Estd. of Mini dairy	1.00	622	622.00	80.00	44.40			435.40	62.20	<b>622.00</b>
<b>III</b>	<b><u>Animal Health</u></b>										
9	Mobile veterinary routes / Setting up of Disease Investigation Lab.	5.00	7	35.00		30.00	5.00				<b>35.00</b>
10	Estd. Breeding units	4.00	50	200.00	40.00	0.00			140.00	20.00	<b>200.00</b>
<b>IV</b>	<b><u>Animal Nutrition</u></b>										
11	Expansion of Cattlefeed plant	500.00	1	200.00		200.00					<b>200.00</b>
12	Estd. of new Cattle Feed Plant - 100/50 MTD	1500.00	0	0.00							<b>0.00</b>
13	Estd. of Formaldehyde plant	90.00	0	0.00							<b>0.00</b>
14	Estd. of Mineral Mixture plant	15.00	1	15.00		15.00					<b>15.00</b>
15	Estd. Fodder Seed Processing plant	55.00	0	0.00							<b>0.00</b>
16	Estd. of fodder block making units	25.00	3	75.00		75.00					<b>75.00</b>
	Estd. of fodder block making units under PPP	6.50	30	195.00	0.00	39.00			136.50	19.50	<b>195.00</b>
17	Ration balancing scheme	0.30	17	5.10	0.00	5.10					<b>5.10</b>
18	Estd. of fodder demonstration units	0.016	1279	20.46	12.80	7.66					<b>20.46</b>

<b>V</b>	<b><u>Manpower Development</u></b>										
19	Capacity enhancement of Training Centre	75.00	1	75.00		75.00					<b>75.00</b>
20	Training of farmers for society organisation	0.052	1133	58.92	0.00	48.52	10.40				<b>58.92</b>
21	Training of farmers for AI	0.080	251	20.08	5.04	10.40	4.64				<b>20.08</b>
22	Study tour of farmers	0.0280	1532	42.90	22.40	14.00	6.50				<b>42.90</b>
23	Awareness programme for milk producers	0.0011	12220	13.44		11.00		2.44			<b>13.44</b>
<b>VI</b>	<b><u>Processing Infra-structure</u></b>										
24	Estd. of R&D Lab	300.00	0	0.00		0.00					<b>0.00</b>
25	Estd. of Bulk Coolers	23.00	47	1081.00		575.00	230.00		276.00		<b>1081.00</b>
26	Estd. of new dairy plants	1500.00	4	5893.00	4093.00	1100.00		100.00	600.00		<b>5893.00</b>
27	Refurbishing of existing dairy plants	300.00	2	450.00		166.40	194.00	25.60	64.00		<b>450.00</b>
28	Estd. of auto milk collection centres	2.00	119	238.00		160.00	12.00		66.00		<b>238.00</b>
29	Refrigerated van	20.00	1	20.00		20.00					<b>20.00</b>
30	Whole day booths with insulated box and Deep freezes	2.50	75	187.50		150.00	37.50				<b>187.50</b>
31	Walk-in-cold stores	9.00	11	99.00		99.00					<b>99.00</b>
32	Cold chain (visicoolers/deep freezes)	0.20	136	27.20		27.20					<b>27.20</b>
33	ERP	100.00	2	200.00		200.00					<b>200.00</b>
34	Monitoring and Evaluation			227.41		227.41					<b>227.41</b>
	<b>TOTAL</b>			<b>11597.43</b>	<b>4446.30</b>	<b>4414.03</b>	<b>766.64</b>	<b>150.86</b>	<b>1717.90</b>	<b>101.70</b>	<b>11597.43</b>

# **ROAD MAP FOR FISHERIES DEVELOPMENT**

## 17. FISHERIES DEVELOPMENT

17.1 **Introduction** : State is endowed with vast potential of fisheries water resources. It includes 69000 ha ponds and tanks, 9000 ha oxbow lakes, 7200 ha reservoirs, 3200 km rivers and about 1,00,000 ha of riverine and other flood plains wetlands. The average annual production of fish is nearly 2.61 lakh tonnes against the annual demand of 4.56 lakh tonnes. Thus it seems necessary to double the production to bridge the vast gap between demand and supply. For this it is essential to make a specific work plan and road map.

17.2 Aquaculture and culture based fisheries are the options for enhancing the productivity of more amenable waters such as ponds and the oxbow lakes (mauns) with immediate results. Overall the proposed road map aims at implementing the following main activities:-

- ❖ conservation of water bodies like ponds and tanks
- ❖ intensive and semi intensive fish culture in ponds
- ❖ construction of inlet and outlet for easier passage in mauns for culture based fisheries
- ❖ culture up to an optimum size
- ❖ raising annual production of fry up to 65 crores from the present level of 35 crores
- ❖ developing the market system to support farmers for different price

Specific stress has been given in this road map on developing culture based fisheries in mauns and bringing ponds into intensive and semi intensive culture to attain the desired level of 4.56 lakh tonnes of annual fish production. Apart from these other supporting schemes would also continue. Brief descriptions of schemes are as follows:-

### 17.2.1 Arrangement of fingerlings as seeds:-

For developing oxbow lakes into culture based fisheries and bringing ponds into intensive/semi intensive culture, the annual requirement of fingerlings would be around 40 crores. Apart from this, other water bodies would also demand seed. Species wise requirement of 40 crores fingerlings may be summarized as depicted in the following table:-

Species	% in Total	Number of seeds in crores			Required Brooders* (Kg)	
		Fingerlings	Fry	Spawn	Female fish	Male fish
1. Catla	30	12-00	24-00	79-20	15900	15900
2. Rohu	30	12-00	24-00	79-20	15900	15900
3. Mrigal	20	8-00	16-00	52-80	10600	10600
4. Grass Carp	10	4-00	8-00	26-40	5280	5280
5. Common Carp	8	3-25	6-50	21-45	4290	4290
6. Silver Carp	2	0-75	1-50	4-95	990	990
	<b>100</b>	<b>40</b>	<b>80</b>	<b>264</b>	<b>52960</b>	<b>52960</b>

\* overall 50,000 spawn production/kg body wt. of female

As indicated above, in order to meet the fry requirements for aquaculture in ponds and mauns, about 100 seed production units, including a hatchery, are required to be setup in different parts of state. These centres would either produces spawn for their spawn from other nearby hatcheries. To support fish seed production “**Brood Banks**” would be established in adequate numbers be facilitated. Portable hatcheries would be assisted by brood banks as and when there is demand of brooders.

#### 17.2.2 Fish seed production units:

Fish seed farms would be developed as fry and fingerling production centres. The state would require nearly 664 ha to 750 of nursery area to cater fry and fingerling motivated to stock fingerlings and the present practice of stocking spawn directly into waterbodies would be discouraged. A buy-back system of fingerlings has been framed and it would be implemented as a separate scheme.

- ❖ Fish seed growers and ponds would be marked for 40 crores of fingerlings production. Nearly 664 ha nursery area would also be selected.
- ❖ seed rearing units would be having nursery area of 0.2 ha (this is for calculating the number of units only)
- ❖ every seed rearing unit would be given Rs. 12000 as loan for raising 45 days fingerlings from spawn

- ❖ every seed raising unit (0.2 ha) would produce 1.20 lakh fingerlings
- ❖ these fingerlings be bought back by farmers under a special scheme
- ❖ seed growers would return their loan either support in running this scheme or they may directly run this scheme
- ❖ FFDA's will help the seed growers in selling their fingerlings
- ❖ all the seed growers would be pre-identified by the Department.

Year-wise physical targets and financial estimates as follows:

(Rs. in lakh)

Sl.	Action	Year-wise Physical and Financial estimates			
		2008-09	2009-10	2010-11	2011-12
1.	Fingerling prod. (Target in crores)	10	20	35	40
2	Required rearing space (ha)	166	332	583.3	664
3	Cost on rearing (as loan) (@ 10 paise per fingerling)	100	200	350	400
4	Brood Banks	265	100		
<b>Total (Rs. in lakh)</b>		<b>265</b>	<b>300</b>	<b>350</b>	<b>400</b>

### 17.2.3 Intensive/semi intensive fish culture in ponds:

As per the present estimates 69000 ha water area is available as ponds and tanks. The main chunk of fish production in the state is from these water bodies only. Though these water bodies have grown old and there is deposition in silt in their beds in most of the tanks. Renovation of Govt. ponds is being done in National Rural Employment Guarantee Scheme and people in private sector are interested in creating new water bodies as well as renovating the old ones. The present achieved mean fish productivity in developed ponds in the state is about 2.2 tonnes/ha/yr. Addressing 50,000 ha of ponds area for development in a mission mode, it is proposed to enhance the productivity to 3 tonnes/ha/yr in 30,000 ha and 5 tonnes/ha/yr in 20,000 ha area. Carps being the mainstay of pond culture, Indian major carps are

suggested to be employed, along with chine carps where ever required also considering the prevailing market rates.

### Input requirements for enhancing productivity in ponds

Activity	Yield Rates		Total
	3 t/ha/yr.	5t/ha/yr.	
Proposed area to be brought under culture, hectares	30,000	20,000	50,000
Envisaged annual fish production, tones	90,000	1,00,000	1,90,000
Stocking density, fingerlings/ha (@ 800 g harvest size and 80% survival)	5,000	8,000	
Annual fingerling requirement, lakh	1,500	1,600	3,100
Annual fry requirement (@ 50% survival from fry to fingerlings), lakh	3,000	3,200	6,200
Annual spawn requirement (@ 30% survival from spawn to fry), lakh	10,000	10,700	20,700
Feed requirement, tones/hectare (FCR-1.2:1 for 3 tones/ha/yr and 1.5:1 for 5 tones/ha/yr.	3.6	7.5	
Annual feed requirement, tones	1,08,000	1,50,000	2,58,000
Annual input costs (including lease amount, costs of seed, feed, fertilizers wages etc.), Rs./ha	95,000	1,50,000	
Annual value of fish production (@ Rs. 50,000/t at farm gate), Rs./ha	1,50,000	2,50,000	
Net returns, Rs./ha/yr.	55,000	1,00,000	
Annual input costs, Rs. in crore	285	300	585
Annual value of fish produced, Rs. in crore	450	500	950

3000 - 5000 Kg/ha

Intensive / semi intensive Fish production in ponds



2000 - 2200 Kg/ha

Present production of developed tank

### 17.3 Scheme:

Ponds in the State have been divided into three categories namely, A, B and C depending upon the productivity. Ponds owners/lessee would be provide fingerlings in adequate numbers to stock their ponds. In first two years it would be the responsibility of the lessees/societies to raise the production level upto 3 tonnes/ha/yr. The cost of the fingerlings given to a beneficiary would be taken that next year before issuing the *Parwana* for fishing. In case of private farmers there would be a different method of collecting the cost of fingerlings given to them.

### 17.4 Transfer of money:

- ❖ farmer would be given required no. of fingerlings @ 5000 fingerlings per ha water area
- ❖ the cost on seeds (@ 50 paise per fingerling) would be given to him as loan, by cheque
- ❖ the cheque will be in favour of the seed grower and the District Fisheries Officer as Escrow Account Payee from where the farmer will collect seeds
- ❖ the settlee of a pond after receiving the number of fingerlings required will hand over the cheque to the fish seed grower

- ❖ fish seed grower will hand over the receipt of that very cheque to the farmer/settlee which has receive the fingerlings from him
- ❖ this receipt would be submitted to the Office of The District Fisheries Officer
- ❖ the cost of the fingerlings given to a beneficiary would be taken that next year before issuing the *Parwana* for fishing

**17.5 Year-wise requirement of funds and number of fingerlings to be stocked are as follows:**

(Rs. in lakh)

Sl.	Action	Year wise Physical and Financial estimates			
		2008-09	2009-10	2010-11	2011-12
1.	Supply of seeds (No. in crores)	5	10	14	14
2	Cost on seeds to be given as loan to farmers @ 50 paise/fingerling	250	500	700	700

**17.6 Culture bases fisheries in oxbow lakes:**

Mauns or oxbow lakes are cut off portions of meandering rivers. They are one of the important resources of aquaculture. They are very productive and their annual fish production potential ranges between 1500-2000 kg/ha as estimated by ICAR institute. Their number in the state is nearly 100 and presently mauns are mostly being utilized for capture fisheries. Present level of production is 60-70 kg/ha/yr. Some of the lakes which have been developed are giving production upto 400-500 kg/ha/yr. This depicts that oxbow lakes can give production many folds if they are utilized in culture pattern. It is proposed to bring 5000 ha of mauns in culture based fisheries.

**17.6.1 Present physical status of oxbow lakes:**

- ❖ These are in various levels of entrophication
- ❖ Presence of thick stands of macrophytes (3 to 20 kg/m<sup>2</sup>)
- ❖ Natural and anthrogenic interferences
- ❖ Non-functional connecting channels

### 17.6.2 Action Plan:

- ❖ Making aware about the technology and programme to beneficiaries/societies
- ❖ Making an agreement between the district fisheries officer cum ceo and the selected beneficiary
- ❖ Construction or repair of inlet and outlet channels for proper controll of water
- ❖ Weed clearance
- ❖ Stocking with reasonable sized fingerlings
- ❖ Pre and post stocking training of fishermen for proper management
- ❖ Pen culture for advance fingerlings
- ❖ Fishing before floods as an where required

Sl.No.	Action	Quantity	Exp. Production
1	Water area under culture based fisheries	5000 ha	
2	Annual requirement of fingerling @ 2000 seed/ha	100 lakh	
3	Expected production @ 960 kg/ha	4800 tonnes	Average 4500 tonnes

### 17.6.3 Seed raising in pens in mauns with a unit area of 0.1 ha to produce 50,000 fingerlings in one cycle

A. Initial Expenditure	Unit Cost (Rs.)	Total Cost (Rs.)
Bamboo, 125 nos.	80/pc	10,000
Velon screen net, 600 ,	10/m	6,000
Black paint, 20 It	100/It	2,000
Nylon thread, 20 kg	100/kg	2,000
Labour for construction, 50 Mandays	100/manday	5,000
<b>Sub Total A</b>		<b>25,000</b>
<b>B. Recurring</b>		
Seed, 1,00,000 fry	80/1000 fry	8,000
Feed, @ 1% of body weight		3,200
Medicine, etc.		500
<b>Sub Total B</b>		<b>11,700</b>
<b>Grand Total (A+B)</b>		<b>36,700</b>

Generally 4 pens of 0.1 ha area can cater a 100 ha oxbow lakes.

#### 17.6.4 Proposed year-wise expenditure and physical targets

(Rs. in lakh)

Sl.	Action	Yearwise Physical and Financial estimates			
		2008-09	2009-10	2010-11	2011-12
1	Proposed water area to be developed (5000 ha/nearly 60 lakes)	1500	2000	1500	-
2	Annual demand of fingerlings (No. in lakh)	30	70	100	100
3	No. of pens (0.1 ha)	60	140	200	200
<b>FINANCIAL</b>					
4	Expenditure on civil development of mauns (Rs. in lakh)	300	400	300	
5	Expenditure on pens, seeds and feeding	36	69		

#### 17.7 Development of fisheries water logged area:

Mostly water logged areas suitable for fish culture are in private sector. Department of Animal Husbandry, Dairying and Fisheries (GOI) has a Centrally Sponsored Scheme for Fisheries Development in water logged areas. It is a bankable or self financing scheme providing subsidy @ 20% of the unit cost. The unit cost for developing one ha water logged area is Rs. 1.25 lakh along with an additional support as inputs at the rate of Rs. 75000 per hectare. It is also supported by 20% subsidy. The subsidy upon both activities would be shared by the State Government and GOI on 25:75 basis.

17.7.1 Overall Physical and Financial Targets are as follows:

(Rs. in lakh)

Sl.	Action	Units (ha)	Year-wise breakup			
			2008-09	2009-10	2010-11	2011-12
1	Development of water logged area	1000	50	200	600	150
2	Subsidy	Rs. 40000 per ha	20	80	240	60

17.8 Feed Production:

- ❖ It is proposed to establish fish feed mills in different parts of state through pvt. Sectors, fisheries co-operative societies and their federations
- ❖ 25% of its unit cost (nearly Rs. 12 lakh) would be through subsidy and rest by institutional financing.

17.8.1 Year wise Physical and Financial Targets are as follows:

(Rs. in lakh)

Sl.	Action	Year-wise Physical and Financial breakup			
		2008-09	2009-10	2010-11	2011-12
1	No. of feed mills proposed	100	150	150	150
2	Total cost including bank loan	1200	1800	1800	1800
3	Subsidy (25%)	300	450	450	450
4	Expected annual production (tonnes)	3000	7500	12000	16500

17.9 Post Harvesting Marketing:

Scheme is proposed to build the market linkages and infrastructure for safe, fast and hygienic transport, developing cold chains to reach fish to different parts of State and beyond. Common collection centres, small four wheelers, pickup vans and insulated rickshaw are proposed in this scheme along with ice plants at some places.

### 17.9.1 Source of funding:

Centrally sponsored scheme on Development of Infrastructure Post Harvest Marketing.

As per norms fisheries co-operative societies/NGOs would get 75% assistance form GOI and the rest 25% would be provided by the State Govt. as a special package. Federations would get 100% assistance from GOI.

#### 17.9.1.1 Year wise Physical Targets and Financial Estimates

(Rs. in lakhs)

Sl.	Items of Work	Year wise Financial Estimates				Remarks
		2008&09	2009&10	2010&11	2011&12	
<b>A</b>	<b>Expenditure through Fisheries Co-operative Societies</b>					
1	Small vehicles (Four wheelers/ Kiosks etc. (nos.)	10	20	30	40	
1.1	Expected Exp.	40-00	80-00	120-00	160-00	
1.2	From State Plan	10-00	20-00	30-00	40-00	'Rest GOI
2	Pickup Vans with other facilities (nos.)	5	10	15	20	
2.1	Expected Exp.	40-00	80-00	120-00	160-00	
2.2	From State Plan	10-00	20-00	30-00	40-00	Rest GOI
<b>B</b>	<b>Assistance to Federation</b>					

1	Pickup Vans (nos.)	2	5	10	10	
1.1	Expected Exp.	16-00	40-00	80-00	80-00	
2	Ice plants	10	20	20	20	
2.1	Expected Exp.	40-00	80-00	80-00	80-00	100% Central Govt.
3	Ice plants	&	1	2	1	
3.1	Expected Exp.		40-00	80-00	40-00	100% Central Govt.
<b>Expenditures through FFDA's</b>						
1	Insulated Thela	40	50	50	50	NFDB 38 Distt. x 5 = 190
1.1	Estimated Cost	8-00	10-00	10-00	10-00	
2	Common Collection Centre	5	10	10	&	
2.1	Estimated Cost	15-00	30-00	80	&	Included in Maun Scheme
<b>State Plan Total :</b>		<b>20</b>	<b>40</b>	<b>60</b>	<b>80</b>	<b>State Plan+RKVY</b>
<b>Central Plan Total :</b>		<b>124</b>	<b>280</b>	<b>430</b>	<b>450</b>	<b>NFDB+Central Share</b>
<b>Grand Total :</b>		<b>159</b>	<b>360</b>	<b>520</b>	<b>530</b>	

### 17.10 Training of Farmers:

Training is an essential tool for carrying technology to farm and field. Presently the department is totally dependent upon ICAR institutes for quality training of farmers. Farmers are being sent to Kakinada Centre of CIFE for 10 days training. It is

proposed to impart outside state training to 1000 farmers every year and arrange training of 2000 farmers at division and state level training centres.

(Rs. in lakh)

Sl.	Training	Year-wise breakup				Source of Funding
		2008-09	2009-10	2010-11	2011-12	
1	Out side State ICAR institute	1000	1000	1000	1000	
1.1	Financial estimate	57.00	58.00	60.00	60.00	
2	Division and State level training					
2.1	Financial estimate					

#### 17.11 Para Extension Workers Scheme:

Presently this scheme is being implemented in 10 districts. Para Extension Workers are selected, given training and are supposed to work with farmers and their consultants. Initially they are paid Rs. 2000 per month for three months to prepare a working field for them. They undergo an agreement with farmers for their consultancy services. This scheme is being expanded to all the districts. There would be 1000 Para Extension Workers in the State and the estimated annual expenditure would be around Rs. 85.00 lakh. Out of this Rs. 25.00 lakh would be spent upon training only. Para Extension Workers would be given aquaculture testing equipments also. Para Extension Workers would get due share in the additional production of the crop.

### 17.11.1 Yearly Physical Target and Financial Estimates

Sl.	Programs	Yearly Financial Estimates			
		2008-09	2009-10	2010-11	2011-12
1	Para Extension Workers (nos.)	1000	1000	1000	1000
2	Expected Expenditure	85.00	135.00	135.00	85.00

### 17.12 Survey of ponds:

Authentic and update database is necessary for any effective planning. Work on preparing a strong database for effective planning in Fisheries Sector. A scheme for survey of ponds (both Govt. and Private Sector) in ten selected districts is operational. It would be expanded to all the districts and the estimated cost is Rs. 41.00 lakhs. Survey would be done by specially trained individuals. Areas where numbers of tanks are in lesser number, surveyors would get one hundred Rupees for survey of a pond.

### 17.13 Extension Schemes:

Extension schemes in Fisheries Sector need the strongest financial support as they have not been receiving due budgetary support. Fisheries offices in fields are up to district headquarters only. So it has been decided to strengthen extension system. National and State level workshop/seminars would be arranged for effective communication and sharing views with stake holders. The overall expected expenditure in four years is Rs. 75.00 lakh.

### 17.14 Establishment of an Aquarium House at Patna:

Many species of ornamental fishes are found in ox-bow lakes and chours of the state. They have a good commercial value. Fishermen are unknowingly kill these precious fishes or they are not getting their due price. An institute is badly needed to promote their culture and breeding. It has been decided to establish an aquarium

house-cum-research centre at Patna. Bihar flood support many species of ornamental fishes but their commercial marketing has not been established yet.

Thus to promote ornamental fisheries in the state and awareness among people this aquarium complex has been decided. This would be at prime location at Patna and would be an important place of entertainment for people.

#### 17.14.1 Year-wise Financial Estimates are as follows

Sl.	Training	Year-wise Estimated Expenditure				Remarks
		2008-09	2009-10	2010-11	2011-12	
1	Estb. of an Aquarium House in Patna	95.00	400.00	10.00	10.00	RKVY

#### 17.15 Group Accident Insurance Security to Active Fishermen:

Fishermen work in some of the most hazardous area prone to accidents. Presently the State Govt. provides insurance coverage to 50,000 active fishermen under National Scheme for Welfare of Fishermen. It is proposed to provide insurance coverage to more active fishermen. Apart from this active fishermen would be provided coverage under Janshree Bima Yojna. Under this scheme Rs. 50.00 per person would be provided to the insurance company and Rs. 50.00 would be given by the beneficiaries himself. The rest Rs. 100.00 would be provided by the Social Security Fund. Twenty thousand fishermen are being targeted to be insured during 2008-09.

17.15.1 Year-wise details both Financial and Physical are as follows:

Sl.	Insurance Security	Target	Year-wise Cost (Rs. in lakh)				Remarks
			2008-09	2009-10	2010-11	2011-12	Source of Funding
1	Insurance Under Central Sponsored Scheme	nos.	60000	70000	85000	85000	State Plan
1.1	Amount		8.40	9.80	11.90	11.90	50%
2	Janshree Insurance Plan	nos.	20000	25000	30000	35000	
			10.00	12.50	15.00	17.50	State Plan
			20.00	25.00	30.00	35.00	Social Security Fund
			10.00	12.50	15.00	17.50	Beneficiary Share
Total 2.1			40.00	50.00	60.00	70.00	
Total 1.1 + Total 2.1			48.40	59.80	71.90	81.90	
			38.40	47.30	56.90	64.40	Amount to be budgeted

17.16 Model Fishermen Village:

Houses, safe drinking water and community hall are given to poor fishermen under National Scheme of Welfare of Fishermen, Unit cost of a house is Rs. 40,000 and that of a hand pump is Rs. 12,000. One community hall is constructed where more than 75 houses are built. Houses are built by the fishermen themselves and the

amount for this is given to them by cheque. It is a centrally sponsored scheme in which is cost is shared by the State Govt. and GOI on 50:50 basis.

#### 17.16.1 Yearly Physical Target and Financial Estimates

Sl.	Model Fishermen Village	Yearwise Estimated Expenditure (Rs. in lakh)				Remarks
		2008-09	2009-10	2010-11	2011-12	Sources of Funding
1	No of Houses	200	200	230	230	
1.1	Total Cost	42-50	85-00	150-00	85-40	State Share
1.2		42-50	85-00	150-00	85-40	Central Share

#### 17.17 Fisheries Research Scheme:

There is Solitary Operational Research Centre at Patna. Techniques which would be beneficial to farmers are experimentally adopted here in local conditions. Apart from this soil, water testing & disease diagnosis are other facilities available with this centre.

#### 17.18 Demonstration of Integrated Fish Farming:

The main theme of this farming system is to reduce cost on feed in commodities integrate one or more than one commodities with aquaculture. These commodities may be poultry, cattle, horticulture or duckery etc. Under a Centrally Sponsored Scheme of the Ministry of Agriculture revision for Bank Loan and subsidy is available. In general there is very slow pace of loan forwarding in this scheme by the commercial banks. Therefore, to begin with as demonstration project this program is being proposed under RKVY. Hence, the program is to be funded entirely by the Govt.

under RKVY. Under this scheme there would be demonstration Centres in each district, covering water area nearly one hectare.

#### 17.18.1 Yearly Target and Financial Estimates are as follows

Sl.	Demonstration of Integrated Fish Farming	Year wise Expenditure (Rs. in lakh)				Remarks
		2008-09	2009-10	2010-11	2011-12	Sources of Funding
1	38 hectare (¼ Physical Target)	&	20 ha	18 ha	&	RKVY
1-1	Amount @ Rs.80,000@ha	&	16	15	&	

#### 17.19 Training Centre at Patna:

To make technology available at farms and ponds training is the best tool. Fisheries Department has no State level training centre. Directorate of Fisheries is totally dependent upon ICAR institutes where intake capacity is very limited. A training centre at Patna is proposed under this program. Infrastructure development and creation of posts will be done in this program. The detail expenditures are shown in the combined table. National Fisheries Development Board is also supporting training programs and with establishment of this training centre expenditure on TA/DA of farmers for outside the State training will be saved.

#### 17.20 Strengthening of FFDA's:

There are 33 FFDA's operational in the State. Presently their financial activity is very limited and they are not working as independent organization. To make them effective and for operationally strengthening them it is proposed to provide them a

working capital of Rs. 10.00 lakhs. This will provide speedy implementation of developmental schemes. With this FFDA's will manage their own business. This fund would be used as a revolving fund.

#### 17.21 Crop Insurance Scheme:

It is being proposed to bring fish crop in a pond under insurance coverage. With this farmers will get insurance benefit in case of their crop damage by natural calamity or damage by miscreants. The premium for the crop insurance may be shared by beneficiaries and the State Govt. A detail scheme is under consideration for the same. The present calculation is based upon a scheme by the Oriental Insurance Company in which cost of fish (per hectare production) has been kept at Rs. 40,000. Half of the premium would be borne by the farmer or the settlee of the pond.

##### 17.21.1 Year-wise Physical Targets and Financial Estimates are as follows

Sl.	Physical Targets	Units	Yearwise Expenditure (Rs. in lakh)				Remarks
			2008-09	2009-10	2010-11	2011-12	Sources of Funding
1	Water area to be insured	ha	10]000	20]000	28]000	50]000	
2	Estimated Premium	Rs. 2000/ha	200	400	560	1000	
2-1	State Share	50%	100	200	280	500	
2-2	Beneficiary Share	50%	100	200	280	500	

## 17.22 Renovation of Ponds:

Fisheries ponds in the State are very old. Due to frequent floods along with natural weathering and erosion they have lost their optimum carrying capacity. Though efforts are being made through schemes like RSVY and National Rojgar Guarantee Yojna, a targeted approach is necessary. Similarly subsidy based Centrally Sponsored Scheme for renovation/construction of new ponds needs the similar approach.

### 17.22.1 Year-wise Physical and Financial Estimates

Sl.	Work/Physical Target	Unit	Yearwise Expenditure (Rs. in lakh)				Remarks
			2008-09	2009-10	2010-11	2011-12	
1	Renovation of Govt. ponds	ha.	5000	6000	8000	8000	
1-1	Estimated Exp. @ Rs. 2.00 lakh /ha	Rs. in Crore	100	120	160	160	NREGS
2	Renovation of Private ponds	ha.	500	600	800	800	
2-1	Amount of Subsidy @ 12000/ha	Rs.	0-15	0-18	0-24	0-24	State Plan
			0-45	0-54	0-72	0-72	Central Share Bank loan/ Self finance

(Financial Estimates may vary depending upon the Administrative Approval of the CSS Scheme related to this.)

17.22.2 Year-wise Physical targets and Financial estimates are as follows

(Rs. in lakh)

Sl.	Works/Physical targets	Units	Yearwise breakup				Remarks
			2008-09	2009-10	2010-11	2011-12	
1	Renovation of Govt. ponds	ha	5000	6000	8000	8000	
2	Estimates exp. @ Rs. 2 lakh/ha	Rs. in lakh	10000	12000	16000	16000	
3	Renovation of ponds in pvt. sector	ha	500	600	800	800	
4	Estimated subsidy @ Rs. 12000/ha	Rs. in lakh	60	72	96	96	

**17.23 Matsya Krishak Samman Yojna:**

With the aim to encourage fish farmers and promoting them to increase productivity *Matsya Krishak Samman Yojna* is being proposed. Farmers would be given Fisheries and Aquaculture instruments i.e., aerator, pumping set, water and soil testing kit etc. in *Samman Yojna*. Those fish farmers who have attained an annual production level of 3000 kg fish/ha may qualify for this scheme. Cumulative financial estimate for four years is Rs. 35.00 lakh. Year-wise detail is given in the table:

17.23.1 Yearwise Earmarked Resources for different Schemes in the proposed road Map under Fisheries Sector

(Rs. in Lakh)

Sl.No.	Schemes	Year-wise Expected Financial Exp.				Source of Funding
		2008-09	2009-10	2010-11	2011-12	
<b>1 Arrangement of Fish Seed</b>						
1.1	Establishment of Fish Seed Production Unit	100	200	350	400	RKVY
1.2	Estb. of Brood Bank in Urban Areas	165	100			S.Plan
2	Intensive/semi intensive fish culture in ponds	250	500	700	700	RKVY
3	Dev. of Maun Fishereis (including cost of Fish Seed)	336	469	300		RKVY / S.Plan
4	Dev. of Chaur Fisheries	20	80	240	60	S.Plan/ Central Share
5	Estb. of Fish Feed Production Unit	300	450	450	450	RKVY
<b>6 Arrangement of Fish Marketing</b>						
<b>6.1 Marketing through Fishermen Co-operative Society</b>						
6.1.1	Kiosk/Small four Wheeler with accessories	40	80	120	160	25% S.Plan
6.1.2	Pickup vans with accessories	40	80	120	160	25% S.Plan
<b>6.2 Marketing through Fishermen Co-operative Federation</b>						
6.2.1	Pickup vans	16	40	80	80	100% Central

						Share
6.2.2	Small Wheeler four	40	80	80	80	100% Central Share
6.2.3	Ice Plant	-	40	80	40	
6.3 Marketing through Fish Farmers Development Agencies						
6.3.1	Insulated Thela	8	10	10	10	NFDB
6.3.2	Community Collection Centre	-	-	-		State Plan
7 Training of Fish Farmers						
7.1	Training outside the State	57	58	60	60	S. Plan & NFDB & RKVY
7.2	Training at the State level/Divisional level	34	46	46	46	NFDB & S. Plan & RKVY
8	Scheme for Para Extension Workers	85.00	135.00	135.00	85.00	RKVY
9	Scheme for Survey of Ponds	41.00				RKVY
10	Extension Scheme	15	20	20	20	State Plan
11	Estb. of Aquarium House at Patna	95	400	10	10	RKVY
12	Insurance of Active Fishermen (CSS)	48.40	59.80	71.90	81.90	State Plan/ Central Share
13	Scheme of Model Fishermen village	85	170	300	170.80	State Plan/ Central Assistance
14	Scheme of Fisheries Research	5	10	12	15	State Scheme

15	Demonstration of Integrated fish cultures (38 hectares)	-	16	15	-	RKVY
16	Estb. of Training Centre at Patna	31	25	23	23	State Plan
17	Strengthening of Fish Farmers Development Agency	150	150	30	-	RKVY
18	Crop Insurance Scheme	200	400	560	1000	RKVY
19	Scheme of Incentive to Fish Farmers	-	10	10	15	RKVY
<b>20 Renovation of Ponds</b>						
20.1	Renovation of revenue tanks	10000	12000	16000	16000	Rashtriya Rojgar Gaurantte Scheme
20.2	Construction/renovation of ponds in private sector	60.00	72.00	96.00	96.00	State Plan/ Central Share
21	Scheme for SC Farmers	13.00	25.00	12.00	-	
22	State Share for NFDB	-	5.00	10.00	-	
<b>Total :</b>		<b>12234.40</b>	<b>15730.80</b>	<b>19940.90</b>	<b>19762.70</b>	
<b>Grand Total :</b>		<b>67668.80</b>				

Availability of Resources for Different Schemes under Fisheries Sector

Sl.	Name of Schemes	State Schemes	RKVY	Rural Dev. Deptt.	Central Share	NFDB & Non Budgetory	Total
1	Fish Seed Production	-	1050	-	-	-	1050
1.2	Estb. of Brood Bank	265	-	-	-	-	265
2	Loan for intensive/semi intensive fish culture in ponds	-	2150	-	-	-	2150
3	Dev. of Maun Fishereis	600	505	-	-	-	1105
4	Dev. of Chaur Fisheries	100	-	-	300	-	400
5	Estb. of Fish Feed Production Unit	-	1650	-	-	-	1650
6	<b>Arrangement of Fish Marketing</b>						
	a. Marketing through Fishermen Co-operative Society	100	100	-	600	-	800
	b. Marketing through Fishermen Co-operative Federation	-	-	-	656	-	656

	c. Insulated Thela	-	-	-	-	38	38
	d. Community Collection Centre	From Maun Schemes	-	-	-	-	-
7	Training	175	160	-	-	72	407
8	Scheme for Para Extension Workers	-	440	-	-	-	440
9	Survey of Ponds	-	41	-	-	-	41
10	Extension Scheme	20	55	-	-	-	75
11	Estb. of Aquarium House at Patna	-	515	-	-	-	515
12	Insurance of Active Fishermen	76	-	-	21	110+55*	262
13	Scheme of Model Fishermen village	362.90	-	-	362.90	-	725.80
14	Scheme of Fisheries Research	42	-	-	-	-	42
15	Demonstration of Integrated fish cultures (38 hectares)	-	31	-	-	-	31
16	Estb. of Training	102	-	-	-	-	102

	Centre at State level						
17	Strengthening of Fish Farmers Development Agency	-	330	-	-	-	330
18	Crop Insurance Scheme	-	1080	-	-	1080**	2160
19	Scheme of Incentive to Fish Farmers	-	35	-	-	-	35
20	Renovation of ponds in private sector	81	-	-	243	-	324
20.1	Renovation of revenue tanks	-	-	54,000	-	-	54,000
21	Scheme for SC Farmers	50	-	-	-	-	50.00
22	State Share for NFDB	50	-	-	-	-	50.00
<b>Total :</b>		<b>1988.90</b>	<b>8142.00</b>	<b>54000</b>	<b>2182.90</b>	<b>1355.00</b>	<b>67668.80</b>

\* Additional Share of beneficiaries 55.00 lakh

\*\* Share of beneficiaries 1080.00 lakh

### Expenditure under Fisheries Budget

State Plan	:	Rs. 1988.90 lakh
RKVY	:	Rs. 8142.00 lakh
Central Share	:	Rs. 2182.90 lakh
Expenditure through Rural Dev. Department	:	Rs. 54,000 lakh

### Estimated Financial support through Financial Institutions

(Rs. in lakh)

Sl.	Name of Programmes	Yearly Estimates				Total
		2008-09	2009-10	2010-11	2011-12	
1	Fish Feed Meal (nos.)	100	150	150	150	550
1.1	Unit cost @ 12.00 Lakh / unit	1200	1800	1800	1800	6600
1.2	Subsidy 25% (State Share)	300	450	450	450	1650
1.3	Financial support through Banks	900	1350	1350	1350	4950
2	Renovation of Tank					
2.1	Physical Target (ha.)	500	600	800	800	2700
2.2	Total Cost (Rs. in lakhs)	300	360	480	480	1620
2.3	Subsidy 20%	60	72	96	96	324
2.4	Expected financial	240	288	384	384	1296

	support					
3	Insurance coverage to Active Fishermen					
3.1	Share from Central Security Fund (Rs. in lakhs)	20	25	30	35	110
3.2	Share of Beneficiary (Rs. in lakhs)	10	12-50	15	17-50	55
4	Share of beneficiary for Crop Insurance (Rs. in lakh)	100	200	280	500	1080

Financial support through Financial Institutions : Rs. 6246.00 lakh

Financial Support through Social Security Fund : Rs. 110.00 lakh

Share of beneficiaries : Rs. 1135.00 lakh

**Physical Target in Different Schemes of Road Map**

Sl.No.	Physical Target	Unit	Year wise Expected Development			
			2008&09	2009&10	2010&11	2011&12
1	Fish Seed Production	Crore	10	20	35	40
2	Intensive/semi intensive fish farming	ha	30]000	20]000		
3	Dev. of Maun Fishereis	ha	1500	2000	1500	
4	Dev. of Chaur Fisheries	ha	50	200	600	150
5		ha	&	20	18	&
6	Estb. of Fish Feed Production Unit	no.	100	150	150	150
7	Marketing					
7-1	Four Wheelers Van	no.	20	40	50	60
7-2	Pickup Van	no.	7	15	25	30
7-3	Insulated Rickshaw	no.	40	50	50	50
7-4	Integrated Fish Farming	no.	5	10	10	&
7-5	Ice Plant	no.	&	40	80	40
8	Training					
8-1	Training outside	no.	1000	1000	1000	1000

	the State					
8-2	Training at the State level/Divisional level	no.	2000	2000	2300	2300
9	Scheme for Para Extension Workers	no.	269	76	&	&
10	Scheme for Survey of Ponds	no.	30000	30000		
11	Janshree Bima Yojna	no.	20000	25000	30000	35000
12	Estb. of Active Fishermen Housing	no.	200	400	735	402

**Expected Average Annual Fish Production for four year : 4.05 Lakh Tonnes**

# **ROAD MAP FOR COOPERATIVE SECTOR**

## **18. COOPERATIVE SECTOR**

18.1 The cooperative sector will continue to play a major role in the development of agriculture and allied sectors in the state. The cooperative institutions have been traditionally supplying inputs like seeds and fertilizers and have played a major role in making credit available to the farmers in the state through the network of Primary Agricultural Credit societies (PACS) and Central Cooperative Banks (CCBs). However, due to weakening of the cooperative institutions due to their poor financial condition and lack of professional management, the flow of credit as well as supply of inputs to the agricultural sector got considerably reduced in the recent years. This, however, should not lead us to conclude that the role of cooperative sector has lost its relevance in the present context.

### **18.2 Agricultural Credit :**

The cooperative sector still plays a major role in supply of short term credit to the agricultural sector. The target for flow of agricultural credit through the cooperative sector during the 11<sup>th</sup> Plan has been fixed at Rs. 3000 crores against which the achievement during 2007- 08 is expected to be around 400 crores. In order to achieve the 11<sup>th</sup> Plan target, all out efforts will be made to strengthen the Short Term Cooperative Credit Structure (STCCS) which includes PACS, CCBs and State Cooperative Bank. An incremental annual increase of Rs. 100 crores over the entire plan period will be required to achieve this target. Action has already been initiated in this direction by way of implementation of the Revival Package for STCCS. However, the commercial banks and RRBs will continue to play a major role specially for meeting the need of long term credit to the agricultural sector.

### **18.3 Agriculture Inputs :**

The cooperative societies have been traditionally supplying inputs to their members. However, the poor financial condition of Bihar State Cooperative Marketing Union (BISCOMAUN) has adversely affected the input supply business of PACS and Vyapar Mandal Sahyog Samitis (VMSS). At the beginning of the plan period, only about

300 out of 6000 PACS were doing fertilizer business. However, with proper coordination at the district level and the state level, this number has increased to about 1800 by now and these societies have already conducted business worth about Rs. 100 crores during the current financial year. It has been felt that the distribution of fertilizers through the cooperative societies results in better distribution and availability. It is possible to increase the number of such societies to about 2500 by the end of next financial year. With revival of BISCOAUN and allocation of larger quantity of fertilizer for cooperative sector, this number can be further increased to over 4000 by the end of plan period.

The non-availability of quality seeds has led to decline in supply of seeds by the cooperative societies to farmers. With the revival of Bihar Rajya Beej Nigam, a major thrust can be given to supply of quality seeds through these societies.

#### 18.4 Crop Insurance :

As the agriculture in the state is largely dependent on nature, the need for an efficient crop insurance scheme cannot be overemphasized. The state govt. is already implementing the National Agriculture Insurance Scheme (NAIS) since the year 2000. The insurance under the scheme is mandatory for loanee farmers whereas it is optional for the non-loanee farmers. The coverage under this scheme has been increasing over the years and compensation worth over Rs. 500 crores has been paid under this scheme during last five years. It is expected that coverage under the scheme for loanee farmers will increase with increase in flow of agricultural credit as per the target set for the plan period. However, there is vast potential for increasing the coverage of non-loanee farmers under the scheme by suitable extension activities. Towards that end, a scheme has been recently approved, which allows certain categories of PACS, who collect deposits from their members, to collect insurance premium from non-loanee farmers through their accounts maintained in the PACS. The PACS having member deposits above certain benchmark are also paid service charges by the concerned CCB as an incentive. This will lead to easy availability of crop insurance product at the village level and thereby increased coverage of non-loanees. Experience has shown that the condition regarding opening

of bank account for payment of premium is a major impediment in their coverage under the scheme. It is expected that the coverage of non loanee farmers will increase from about 78 thousands during 2006-07 to about 2.5 lakhs by the end of the plan period.

#### **18.5 Marketing and Storage :**

The cooperatives can play a measure role in marketing and storage of agriculture produce. This sector has a large network of 100 MT godowns in about 1900 PACS (panchayat level) and 200-250 MT godowns at block (VMSS) level apart from large storage infrastructure of BISCOAUN across the state. It is expected that another 1100 PACS will have 100 MT godowns by the end of the plan period. These can be utilized for storage of agriculture produce of farmers as well as for marketing of such produce by the societies. The experience of procurement of paddy through cooperative societies in recent years has shown that this sector can help to ensure remunerative prices for farmers. Suitable policy initiatives and incentives can give a major boost to the procurement of paddy as well as other agriculture produce. The policy of allowing societies to supply paddy to the FCI during the current procurement season has led to improvement in the quality of procurement. There is also the need to provide soft loan to the cooperative societies to substantially increase procurement through such societies. A scheme is under formulation for the purpose.

#### **18.6 Agriculture Extension :**

This is the area where the cooperative sector can play the most crucial role as the experience of agriculture extension directly through government machinery has not been very satisfactory. The cooperative societies can be directly involved in running agri-clinics, plant protection units and transfer of technology in a big way as they are the real stake holders.

18.7 Thus, the cooperative sector while holding enormous latent potential to stirrup the rural economy has to be guided in accordance with the recommendations of the Vaidyanathan committee.

Rs. 411.25 Crores, is the approximate financial requirement for the road map years which is as under :-

<b>FINANCIAL YEAR</b>	<b>PROPOSED CAPACITY IN MT</b>	<b>ESTIMATED COST IN lakh RS.</b>
2008 - 09	112500	6075.00
2009 - 10	202500	11810.00
2010 - 11	147500	9292.00
2011 - 12	205000	13948.00
<b>Total</b>	<b>667500.00</b>	<b>41125.00</b>

# **ROAD MAP FOR INSTITUTIONAL FINANCE**

## 19. Institutional Finance

19.1 Bihar agriculture economy is affected to both floods and drought. The average size of land holding is 0.75 ha. Which is the almost of the All India average of 1.57 ha. Small & marginal farms all together constitute 91% of the total land holding of the state.

19.2 Bihar is endowed with good quality of soil resulting in higher productivity but the per capita annual agriculture production of Bihar is only Rs 661 as against Rs. 2304 for India. Bihar has immense potential for agriculture growth.

19.3 The Annual Credit Plan of Bihar reveals that there is an achievement of 80% average in agriculture sector since last 5 years. Though absorption capacity is much higher even than the stipulated target is not achieved.

Hence, the road map plan for agriculture for coming 4 years considering the various parameters has been worked out.

19.4 Accordingly in total credit in agriculture is as under :-

Sl. No.	Year	Amount (Rs in Crores)
1.	2008-09	5724.68
2.	2009-10	7051.98
3.	2010-11	8517.11
4.	2011-12	9465.56
	<b>Total</b>	<b>30759.33</b>

19.5 Detail sector wise credit requirements: -

Ser No.	Sector	2008-09	2009-10	2010-11	2011-12
1	Short Term Credit for Production & Marketing - crop loans	3198.00	4229.98	4913.11	5895.73
2	Investment Credit for Agriculture & Allied Activities	2566.28	2822.00	3604.00	3569.83
3	Total Credit Agriculture and Allied Activities (1+2)	5764.28	7051.98	8517.11	9465.56
4	Non-Farm Sector	1068.53	1175.38	1292.92	1486.86
5	Agro & Food Processing Sector	272.85	300.14	330.15	379.67
6	Micro Credit	24.75	61.88	154.70	386.75
7	Other Priority sector (Excluding SHGs)	2204.15	2424.57	2788.26	4182.39
8	Total Priority Sector (3+4+5+6+7)	9334.56	11013.96	13083.14	15901.23
9	Non-Priority Sector	8264.00	9090.40	9999.44	10999.38
	<b>Total Credit Plan</b>	<b>17598.56</b>	<b>20104.35</b>	<b>23082.58</b>	<b>26900.61</b>

## Financing the Road map

In the previous chapters a vigorous analysis of sector-wise strategies and challenges have been enumerated in graphic details. However a comprehensive, holistic view of the matter is essential to form a bird's eye-view. Suffice it to say that agriculture forms the dominant sector where massive investment is needed, which forms 61% of the total investment envisioned in the road map years.

The total funds required for the four year road map is Rs 6135.97 crores. The detail year-wise, sub-sector-wise financial requirement is as under:-

Year	Name of the sector					Total annual fund requirement (Rs. in crore)
	Agri.	AHD	Dairy	Fish	Coop.	
2008-09	922.13	180.99	115.97	122.34	60.75	1402.18
2009-10	916.70	196.02	116.07	157.31	118.10	1504.2
2010-11	977.02	213.45	114.38	199.41	92.92	1597.18
2011-12	941.27	228.65	125.34	197.63	139.48	1632.37
<b>Total</b>	<b>3757.12</b>	<b>819.13</b>	<b>471.78</b>	<b>676.69</b>	<b>411.25</b>	<b>6135.97</b>

Detailed financial statements can be seen in the respective chapters of each sector. It is emphasized that R.K.V.Y would be the mainstay of the budgetary support from Government of India.