

**DRAFT PLAN**

**COMPREHENSIVE  
DISTRICT AGRICULTURE PLAN  
(C-DAP)**

**DISTRICT BHIWANI  
HARYANA**

**COMPREHENSIVE DISTRICT AGRICULTURE PLAN (C-DAP)  
FOR RASHTRIYA KRISHI VIKAS YOJANA  
OF XI<sup>TH</sup> FIVE YEAR PLAN**

**CONTRIBUTORS**

**DR. ATTAR SINGH, SR. COORDINATOR  
DR. DHARAMVIR S. DAHIYA, ANI. SCI.  
DR. VED PARKASH LUHACH, FARM MANAGEMENT  
DR. M. S. NOONIA, VEGETABLES  
DR. ANIL RATHI, AGRIL. ECONOMIST, KVK SONEPAT  
DR. RAMESH SHARMA, SOIL SCIENTIST, KVK SONEPAT  
DR. SURENDER SINGH DAHIYA, AGRONOMIST, KVK SONEPAT  
&  
DISTRICT'S OFFICERS OF LINE DEPARTMENT**

**DISTRICT BHIWANI  
HARYANA**

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# CHAPTER I

## INTRODUCTION

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### **Background and Purpose of C-DAP**

The economic reforms commenced in 1991 has successfully put the economy in a higher growth orbit with more than 8 percent growth rate in total Gross Domestic Product (GDP) especially during the recent years. However, the Agriculture sector which accounted for more than 30 per cent of total GDP at the beginning of reforms failed to maintain its pre-reform growth. On the contrary, it witnessed a sharp deceleration in growth after the mid 1990s as the per annum growth in agriculture sector, dropped to 1.9 percent during 1996-97 to 2001-2002 from 3.2 percent in the period from 1980-81 to 1995-1996. This happened despite the fact that agricultural productivity in most of the states was quite low, as it were, and the potential for the growth of agriculture was high. Again, the 10th five year plan target of growth of 4 per cent per annum in agriculture and allied sectors, set to reverse the sharp declaration of 1996-97 to 2001-02 has not been achieved. The approach paper to the 11th plan also emphasized that reversal of the deceleration in agricultural growth witnessed after 1996 is a pre requisite for the success of this plan. A sustained and wide spread agricultural growth is a pre-condition of rural development in India as more than 50 percent of country's work force still depends upon Agriculture for its livelihood. This slow growth in agriculture (including allied sectors) can be of great strain for the economy as agriculture is not only an important driver of macro-economic performance but it is also an essential element of the strategy to make growth more inclusive. Concerned over this pace of growth in agriculture and allied sectors, the National Development Council (NDC) in its meeting held on 29th May, 2007 resolved that a special Additional Central Assistance Scheme i.e. National Agriculture Development Programme (NADP) Rastriya Krishi Vikas Yojana (RKVY) be launched with the following main objectives.

- To incentivize the States for increasing public investment in agriculture and allied sectors.
- To ensure that agricultural plans of Districts/States are prepared and are based on agro-climatic conditions, availability of technology and natural resources.

- To reduce the yield gap in important crops and increase production and productivity in agriculture and allied sectors through focused and holistic initiatives.
- To ensure that local needs/crops/priorities are better reflected in the agricultural plans of the Districts/States.
- To provide flexibility and autonomy to States in planning and implementation of agriculture and allied sector schemes.
- To maximize income of farmers in agriculture and allied sectors.

The eligibility for assistance from the Centre under the scheme would depend upon the State Government providing amounts in the Plan Budget of the State for agriculture and allied sectors over the baseline expenditure. As per the NDC resolution, Government of India introduced a new Additional Central Assistance Scheme to incentivize States to draw up plans for their agriculture sector more comprehensively, taking agro-climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries etc. This involves a new scheme for Additional Central Assistance (ACA) to State Plans, administered by the Union Ministry of Agriculture over and above its existing centrally sponsored schemes, to supplement the state-specific strategies. In order to rejuvenate the agriculture during XIth plan, a growth rate of 4 percent per annum has to be achieved (as per NDC commitment) by reorienting development strategies that meet the needs of the farmers. The XI plan provides an opportunity to restructure policies to achieve a new vision based on faster, broad based and inclusive growth. It is designed to reduce poverty and focus on bridging the various divides that continue to fragment our society. It aims at putting the economy on a sustainable growth trajectory with a GDP growth rate of approximately 10% by the end of plan period and target a robust agricultural growth at 4% per year. The agriculture growth being essential element of the strategy of making growth more inclusive, the NDC advised the State Governments on the preparation of Comprehensive District Agriculture Plans (C-DAP) which includes allied agriculture sectors with full and efficient utilization of available resources.

The concept of integrated local area plans to raise living standard in rural area and overcome food shortage based on specific endowments and needs of each area was initially mooted in 1st Five year plan in 1951. It could not be materialized in true sense as only sporadic efforts and isolated cases of such planning were practically attempted. For success of local area or District level plans the underlying constraints needed to be



identified and required infrastructural investment, extension (and research system) revamping and market reach with the system's conduct and performance have to be synchronized through a holistic policy approach. Keeping this in view, the C-DAP of district Bhiwani is prepared for achieving sustainable agricultural growth with improved farmers' income through participatory process involving stakeholders and various organizations. By establishing strong linkages with required institutional support services the plan will ensure optimum utilization of scarce natural, physical and financial resources.

**The agriculture in the state can't possibly achieve same growth as in the past without recognizing the role of farmer's participatory approach for formulating strategies and finding solutions to new and emerging problems. Similarly due to globalization, trade in agriculture will expand and the state like Haryana can hugely benefit when the trade expands and our formers start making best use of such changes by becoming as secondary producer rather than a primary producer of agriculture commodities. Reforms based on globalization can new pave the way for commercial dairies and subsidiary occupation. The demographic changes due to fast urbanization and slow down in the population will bring greater prosperity in the middle class families. This will to lead to some diversification in food habits leading to more animals and requirement of more cereals for animals. Food demand will go up not purely because of population rise but also because of more requirement of cereals as animal feed. Although in state like Haryana where land used for agriculture will decrease but still there is no reason to believe that agriculture productivity has reached its plateau. New science like GM crops and new approaches like resources conserving technologies will always help us to face new challenge in agriculture development.**

### **Methodology**

The C-DAP was prepared as per the process and methodology suggested by the Planning Commission, Government of India. The approach followed in preparation of the document was necessarily of Participatory Appraisal mode. CCS Haryana Agricultural University, Hisar, Haryan was identified as Technical Support Institute (TSI). The TSI, under the guidance of Director, Extensions Education, provided all necessary technical help to planning units and support groups for preparation of this plan through participatory bottom-up process. The TSI trained the planning Units/Groups in

Participatory Rural Appraisal techniques, designed formats for data collection, guided in data collection and analysis and conducted regular workshops and meetings and did hand holding where ever needed for plan preparation.

The responsibility of preparing C-DAP of Bhiwani district was given to Krishi Vigyan Kendra, Bhiwani. The KVK team, after receiving proper training from TSI held wide consultations with District/Block/Village Agriculture Planning Units of the District

The TSI conducted two days orientation workshop-cum-training programme on 30.03.08 and 31.08.08 at CCSHAU, Hisar. The following specific aspects were covered in the programme.

- Issue and challenges in Agriculture sector
- Planning concepts and district Planning
- Basis features and planning process of RKVY
- Vision, methodology and process of preparing C-DAP
- Participation Rural Appraisal
- Farming system approach
- Farming situation based extension
- INM, IPM, NRM, HRD, Marketing and other important aspects.

**Data collection and consultation:** The KVK team, after receiving proper training from TSI, held wide consultations with District/Block/Village Agriculture Planning Units of the district (different bodies/institutional arrangements under ATMA scheme). Formal and informal meeting with Agriculture and line department staff and Panchayati Raj Institution's member were conducted at different levels. Collected secondary data and related statistics needed for planning from different departments and other sources.

**Primary Data :** For in depth farm/village level study covering important aspects of agriculture and allied fields, the district was divided in to two distinctively Agro-eco-situations (AESs) as was done for SREP preparation under ATMA scheme. From each AES on representative village (Chang from AES-I comprises of block Bawnai Khera, Bhiwani, Ch. Dadri-I, Part of Ch. Dadri-II and Tosham block and Obra from AES-II comprises of Block Badhra, Loharu, Behal, Kairu, Siwani, part of Tosham & Ch. Dadri-II) was selected for collecting required information on modified semi-structured schedules through PRA.

**Con-current review and verification of data :** The primary as well as secondary data collected was cross-checked through triangulations and verified from information

available will different government department and PRA based exercise (earlier conducted by KVK and other agencies)

**Holding farmer meeting at villages selected for representing AES in the district :**

PRA was conducted covering the whole gamut of activities ranging from pre-sowing to post-harvesting and marketing related to agriculture and allied activities being undertaken by the villagers.

**Work plan and activities before the preparation of plan :**

- Meeting of resource team of KVK with line departments heads and officers and PRI's representative.
- Discussed the farmer participation evaluation time frame, activities and responsibilities of all involved in the plan.
- Discussed the plan expected output from five year plan in progress. The stake holders were made clear about subsidies for seed, fertilizer and to bridge possible gap and create environment for farmer's participation in developing and recommending Comprehensive District Agriculture plan (C-DAP).

**Following discussion were held :**

- The current priorities were discussed with farmer. The promising new practices were identified and agreed upon with them. Responsibilities of all stake holders and surveyors were elaborated with staff.

**Before meeting :**

- The PRA schedule based on the past experiences and data required regarding the farmer's need was prepared.
- Important points for discussion containing proposed change in the practices (of management, varieties, site specific nutrient management , IPM, seed, soil health and allied activities) were included and the Performa for Gram Panchayat given in C-DAP manual was modified accordingly. The schedule was made simple and easy to understand.

**During meeting :**

The meetings were ensured to be informal. The farmers were encouraged to participate, interact and made their own fair appraisals in meeting. Lecture type meeting was avoided. Farmers were informed about the objective of the meeting. The dialogue

was started on gap analysis and current scenario regarding productivity, profitability and risk associated with farming systems were discussed.

**The possible changes in the management practices targeted were :**

- Field preparation-zero tillage, bed planter, laser leveler etc.
- Crop establishment-Plant population, seed rate and depth of sowing etc.
- Nutrient management-N and P rate, time, source, use of organic manure, basal and top dressing of fertilizer, application of K and micronutrients.
- Important pests based on economic volume including nematodes and weeds.
- Farmers and scientist came to general agreement on what to do to fill the gap on crops and allied activities.

**Discussed about the proposed design, of FLDs/OFTs (activities) and other activities in farming system approach keeping in view the following :**

- Profitability of cropping system and the rate of return. In order to achieve the rate of return, long term family support is suggested.
- Farmer's inability to invest in the productivity improvement was also discussed as majority of farmers belong to resource poor category.
- Work plan and activities for landless and resource poor farmers was also discussed with the rural masses.
- Collected and discussed the feed back regarding On-Farm related to agriculture and allied sector.

## **CHAPTER II**

### **GENERAL DESCRIPTION OF THE DISTRICT**

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#### **2.1 Introduction**

Bhiwani district came into existence on 22<sup>nd</sup> December 1972. It was carved out of the erstwhile district of Hisar and Mahendergarh. It is bounded by Hisar district in North, Mahendergarh district in South, Rohtak and Jhajjar districts in East and by Rajasthan State in West. District Bhiwani comprises of five sub divisions namely Bhiwani, Charkhi Dadri, Loharu, Siwani and Tosham and ten development blocks namely Bhiwani, Bawani Khera, Charkhi Dadri-I, Charkhi Dadri-II, Badhra, Loharu, Behal, Kairu, Siwani and Tosham. Total number of villages in the district are 444.

#### **2.2 District at a Glance**

##### **2.2.1 Location and Geographical Units**

Bhiwani district is situated in the south-western part of Haryana and lies between 28° 20' to 29° 05' North latitude and 75° 28' to 76° 25' East longitude. Its distance from New Delhi is about 125 kms. The geographical area of district Bhiwani is 4,65,504 ha out of this 4,18,843 ha is cultivable and 3,93,134 ha is cultivated. The area under forest is 3442 ha, cultivable waste is 17,144 ha and land under non-agricultural use is 26,075 ha. Geographically it is the largest distt of Haryana occupying 10.5% area of the state.

##### **2.2.2 Demographic profile**

The demographic details of the district are given in the district profile at a glance (Table – 1) ahead.

##### **2.2.3 Topography and Agro climatic characteristics**

The district falls in semi arid and sub tropical agro climatic zone and it lies along with the Rajasthan state, therefore it is the hottest & driest district of the state. It is largely dry and sandy with undulating topography. The climate remained hot as well as dry in summers and extremely cold in winters. The temperature touches 48°C in June and falls up to 0°C in January. Heavy dust storms are common during the summer. The mean annual rain fall is about 350mm with unevenly distributed throughout the year. The

rainfall in the district increases from west towards East. (211 to 490mm) and over 70% of precipitation occurs during July to September.

Soils are light to medium in texture and pH varies from 7.8 to 8.2. The soils are largely sandy in blocks Badhra, Loharu, Behal, Kairu and Siwani. Sandy to loamy sand in blocks Ch. Dadri-II, Tosham & part of Bhiwani and sandy loam to loamy in blocks Ch. Dadri-I, Part of Bhiwani & Bawani Khera.

#### **2.2.4 Irrigation and ground water**

In Bhiwani district 287000 ha area is under irrigation out of which 1,69,000 ha is under canal irrigation and 1,18,000 ha is under tube well irrigation. Under tube well area 15% water is of good quality, 40% is marginal and 45% is brackish. The ground water depletion is a serious problem in the tube well area as it is going 3-5 feet deeper every year.

#### **2.2.5 Land utilization pattern**

The total geographical area in district Bhiwani is 4,65,504 ha, out of which the cultivable area is 4,18,843 ha and net shown area is 3,93,134 ha. The total gross cropped area during the past three years average is 6,87,334 ha and cropping intensity is 175%.

#### **2.2.6 Farm mechanization**

There are 20096 tractors, 9350 threshers, 24 reapers, 67 harvesters, 65 zero till seed cum fertilizer drills, 24 hybrid cotton seed drills, 65 rotavators and 26313 sprinkle sets in the district.

#### **2.2.7 Industries**

Bhiwani district is an industrially backward district and there are no big industrial units in the district. There are 25 oil expellers, 6 cotton ginning mills, 8 Guar gum industries and only one milk chilling plant in the district.

**Table- 1 District Profile**

1		Geographical Area (Sq.Km.)	4655.04
	a)	No. of Blocks	10
	b)	No. of villages (inhabited)	444
	c)	No. of villages (electrified)	444
	d)	No. of villages connected by all weather roads	444
	e)	No. of villages having supply of potable water	444
2		Average Rainfall (mm)	350
3		Climate	Extremely hot and dry in summer & very cold in winter
4		Population (2001)	
	a)	Male	758253
	b)	Female	666769
	c)	Total	1425022
	d)	Population Density per sq. km.	298
5		Classification of workers	
	a)	Cultivators Male	180372
	b)	Female	138900
	c)	Total	319272
6		Land Utilization (In Hectares )	
	a)	Geographical Area (as per village record)	465504
	b)	Total Agricultural Land	418843
	c)	Net Sown Area	393134
	d)	Forest Land	3442
	e)	Barren Land	17144
	f)	Land not available for cultivation	26075
	g)	Cropping Intensity	175%
7		Size of holdings	No. Area
		(Agriculture Census-2000-01)	
	a)	Less than 1 Ha.	83782 56120 ha
	b)	Between 1.0 - 2.0 Ha.	67579 102595 ha
	c)	Between 2.0 - 4.0 Ha.	38981 120764 ha
	d)	Between 4.0 - 10.0 Ha.	13080 77815 ha
	e)	Above 10.0 Ha.	4370 61449 ha
		Total	207792 418843 ha
8		Irrigation (In Hectares )	
	a)	Net Irrigated Area	287000
	b)	By Canals	169000
	c)	By Tube wells	118000

9		Consumption of Chemical Fertilizers	
		Nitrogen	75.4 Kg. per ha.
		Phosphorus	33.00 Kg. per ha.
		Potash	1.75 Kg. per ha.
10		Agriculture Support facilities	
	a)	Seed/Fertilizers/Pesticides Depots	550
	b)	Rural Markets/ Mandies	
		Regulated markets	7
		Sub-yards	9
	c)	Rural Godowns	24
	d)	Cold Storages	9
11		Animal Husbandry (2003)	
	a)	Dairy Animals	
	(i)	Cows	93610
	(ii)	Buffaloes	441647
	c)	Sheep/Goat	162505
	d)	Poultry Birds	275895

## 2.3 The Vision

### Preamble

In Bhiwani district 2/3<sup>rd</sup> soils are sandy, undulating with poor fertility, low water holding capacity and having limited irrigation facilities. Though the development of irrigation systems (life and sprinkler irrigation) and advanced agro technology has facilitated substantial increase in agriculture production of the district still there exists a wide gap not only between productivity of farmer's fields and FLDs/OFTs but also in district and state productivity.

Moreover, the economic and ecological sustainability of the existing farming systems of the district are in jeopardy. There are wide concerns about the depletion of ground water level, degradation in soil fertility, problem of Orobanche weed, increasing soil salinity near canals and sodicity in tube well area, rising problems of insect-pests and disease complex, decline in bio-diversity, stagnation in yields, rising costs and diminishing economic returns, decline in factor productivity, declining and fragmented small holdings and narrow economic base of the farmers.

Keeping in view the unique situation of small fragmented holdings, lack of capital investment, necessity of recycling, year round employment, risk avoidance, non availability of quality irrigation water and concerns mentioned above, the farmers of the district started attempting, especially during mid eighties, to enlarge the concept of crops



and animal husbandry (being practiced by them since long) by incorporating poultry, fish, vermiculture, vegetables & fruits etc.. This concept of multiple use of inputs and recycling principle was inadvertently put in practice based on traditional knowledge, in efficient integration and without proper market orientation. The success was achieved by large number of farmers with the adoption of sprinkler irrigation and some farmers moved towards integration of some other enterprises. Notables are instances of integration of food crops with vegetables and fruit plants. Majority of the farmers are experiencing low productivity and profitability because of less knowledge, in efficient integration without farming system technologies which include modern farm management skills that enable farmers to improve the efficiency, increased cropping intensity and to integrate and diversify into more high value commodities/enterprises in conformity with market trends.

For vast majority of small holdings prevailing in the district Integrated farming system approach especially with multiple crop husbandry in integration with one or two allied enterprise with market potential is the sure way for optimum utilization of limited resources with sustainable income in time with national interest/goal. Instead of single enterprise the co-existence of multiple enterprises (crops and allied) in an integrated way makes optimum utilization within crop husbandry the plank necessarily be the increased efficiency especially of water, fertilizers and nutrients, human labour and machinery cooled with cost reduction measures elaborated in plan document. The scientific integration of certain enterprises is eco-friendly and imparts sustainability to the system with increased income and employment generation.

The ever increasing cost of production and dependency on purchased inputs can effectively be reined in by adopting this approach through enhanced use efficiency of different critical inputs and water in crop enterprises (multiple) with judicious combination of one or more allied enterprises complimenting each other through effective recycling of residues, wastes, by products or the products itself. The allied enterprises are important part of the farming systems. Both price and income elasticity's of demand for most of these enterprise's products are high. There is huge unfulfilled demand far these products. There exists high potential for increasing the yield rates of these enterprises as the gap between present productivity (in the district) and the achievable yield and potential yield is quite large. The prevailing infrastructural facilities, easy access to big markets and up-coming processing facilities in and around the district are added advantage for the farmers of this district.

## **Vision Statement**

**Achieve productivity growth in agriculture and allied sectors and conserving natural resources at the same time.**

### **Priority Settings**

1. Higher irrigation water use efficiency through (a) Micro-irrigation and more availability of irrigation water through (b) Soil recharge ponds
2. Safe use of brackish water for irrigation
3. Soil health improvement (green manuring, organic manures, vermicompost, INM etc)
4. Promotion of water stress tolerant crops/varieties (castor, barely, ber, aonla and wheat etc)
5. Enhanced rate of seed replacement of major crops
6. Adoption of IPM for insects, pests, diseases and weed control
7. Popularization of resource conservation technologies
8. Shifting from mono-cropping/double cropping to intercropping
9. Promotion of dairying and quality fodder production
10. Intensive trainings of farmers for bridging production gaps of crops, animals and other enterprises
11. Shifting from production oriented farming to market oriented agriculture

## **CHAPTER III**

# **SWOT ANALYSIS OF THE DISTRICT**

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### **3.1 Introduction**

SWOT analysis is a basic, straightforward model that provides direction and serves as a basis for the development of an enterprise. It accomplishes this by assessing an enterprise strengths (what an enterprise can do) and weaknesses (what an enterprise can not do) in addition to opportunities (potential favorable conditions for an enterprise) and threats (potential unfavorable conditions for an enterprise). The role of SWOT analysis is to take the information from the concerned agencies and separate it into internal issues (strengths and weaknesses) and external issues (opportunities and threats). In applying the SWOT analysis in agriculture, it is necessary to minimize both weaknesses and threats. Weaknesses should be looked at in order to convert them into strengths. Likewise, threats should be converted into opportunities. The strengths and opportunities should be matched to optimize the potential production. Applying SWOT in this fashion can generate income for the farmers.

### **3.2. SWOT analysis of the District**

#### **1. Major strengths of the farming systems**

- Suitable agro climatic conditions for the cultivation of mustard, bajra, wheat, guar, barley, dryland horticulture (ber, aonla, guava, belgiri etc) and vegetable crops.
- Well connected by road & rail to NCR and villages have metallic roads.
- Dairy as an integral component of farming system
- MSP for mustard, bajra and wheat
- Developed grain and vegetable markets
- Availability of inputs like seeds, fertilizers, & pesticides etc in village cooperatives or nearby markets.
- Crop loans are available from cooperative and nationalized banks.
- One Vita Milk processing plant in Bhiwani.
- Eight gum industries at Bhiwani, Siwani & Tosham.
- Twenty five oil expeller at Bhiwani, Charkhi Dadri & Tosham.
- Six cotton ginning industries at Bhiwani, Ch. Dadri, Siwani & Tosham.
- Well adapted system of sprinkler in field crops

- A good network of extension services
- Large numbers of cultivators (Males – 1,80,372 and Females – 1,38,900)
- Milk coop. societies in rural areas.
- Good communication facilities in villages

## **2. Weaknesses of the farming systems**

- Poor quality of ground water for irrigation
- Rapid decrease in water table.
- Lacking of poor plant population in crops and intercropping
- No malt industries and processing plants for fruits and vegetables in the district with efficient marketing network.
- Absence of high value crops in present cropping systems
- Unavailability of good quality seeds.
- Erosion of soil fertility due to increasing cropping intensity
- Less application of organic manures.
- Increasing incidence of pests and diseases
- Unavailability of labour during peak period of farm operations.
- Decreasing area under pluses.
- Non-adoption of IPM, INM and over dependence on pesticide and weedicides
- Less area under fruit and vegetable crops
- Poor management of animal dung and crop residues.
- Poor breeding, feeding and management of livestock
- Poor adoption of agro-technology
- Soils are becoming deficient in micro nutrients
- Lack of infrastructure facilities to avoid post harvest losses in fruits and vegetables.
- Rural unemployment due to lack of subsidiary enterprises.
- No big industry in the district.
- Farmers are not organized for marketing of vegetables and horticultural produce

### **Major Opportunities**

- Suitable agro-climatic conditions for diversification of crops and dryland horticultural plants.
- Good scope of drip irrigation in cotton, castor, horticultural crops.
- Agriculture wastes available for recycling to improve soil health
- Agro-technologies are available for suitable crops
- Demand for milk, milk products, and vegetables in nearby cities like Delhi
- Good information and communication system
- Rail and road connectivity is good.
- Good marketing infrastructure
- Agril. Processing units, oil mills and gum factories can be established for employment opportunities.

### **Threats to the Farming System**

- Brackish ground water limiting the choice of crops
- Faulty supply systems of water in canal.
- Application of ground water in kharif crops leading to soil salinity
- Lack of recharging of underground water.
- Imbalance use of fertilizers
- Lack of adoption of recommended technology
- Infestation of Orobanche weed in mustard & tomato.
- Poor breeds of cow and buffaloes
- Lack of concentrates and mineral mixture in feed
- Insufficient green fodder and poor animal health services

## CHAPTER IV

### DEVELOPMENT OF AGRICULTURE SECTOR

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#### 4.1 Introduction

Agriculture is the major source of district economy. The land is sandy and alkaline. After the introduction of sprinkler irrigation system, the irrigation for the uneven fields has become very easy and the district has done remarkable progress in agriculture production still the productivity of the crops is below the state average. Therefore the agricultural growth of the district can be increased further with adoption of proper water management and expansion of net sown area under dry land horticultural crops and vegetables along with drip irrigation system.

#### 4.2 Land Use

Out of the total geographical area of 465504 ha, the cultivable area is 418843 ha. The net area sown during 2006-07 was 397289 ha. It shows that the cultivable area of the district has not yet been fully exploited. Hence, there is further scope in the district to enhance area under cultivation by about 20000 ha. The area under different agricultural crops is given table – 2.

**Table – 2 Present scenario of different crops in district Bhiwani (2004-05 to 2006-07)**

<b>Sr. No.</b>	<b>Crop</b>	<b>Area (ha)</b>	<b>Production (Qtl)</b>	<b>Productivity (kg/ha)</b>
1.	Bajra	189230	1921420	1015
2.	Cotton	60000	631100	1050
3.	Paddy	12000	192000	1600
4.	Mustard	161318	1832120	1136
5.	Wheat	127500	4377900	3434
6.	Gram	73550	544050	740
7.	Barley	4836	131745	2724

Source : DDA

#### 4.3 Soil Health

The soils of the district has varied topography comprising valleys, undulating lands, sand dunes and alluvial plains. According to land capability classification, the soils

of the district varies from good (Class II) to fairly good land (Class IV) suited for occasional cultivation (Annexure III). The majority of soils are sandy and alkaline in nature. Accumulation of salts in the soil after ground water irrigation is very common. The soil health of the district is of poor fertility. As per soil health indices soils are low in organic carbon, low to medium in phosphorus (60% low and 40% medium) and medium in potash. The carbon content in cultivable soils is very low. With the adoption of intensive cultivation the soil productivity has decreased gradually.

#### **4.4 Water Resources & Management**

The surface and ground water resources are very poor in the district. The irrigation water is very scarce input and has become a major hurdle in the growth of agriculture. The major source of irrigation is canal with erratic and poor supply of water & tube wells thereby ground water has been overexploited during recent years. The normal rainfall in the district is also low and not able to recharge the lost ground water level. Therefore, focus should be on water saving techniques like drip irrigation system in horticultural crops & field crops like cotton & castor, irrigation at critical stages of crop growth, land leveling, green manuring and bed planting.

#### **4.5 Major Crops and Varieties in the District**

The major field crops cultivated in Kharif season are pearl millet, cluster bean and cotton.. Likewise, the major crops grown in Rabi season are mustard, wheat, chick pea and barley. The Citrus, Guava, Ber and Aonla are the best suited horticultural crops to the agro-climatic conditions of the district. The vegetable crops namely tomato, cucurbits, carrot, bhindi, cauliflower, chilli, radish, brinjal, pea, leafy vegetables, onion & garlic etc are also grown in the district. The varieties of various crops cultivated in the district are given in Table – 3.

**Table – 3 Major crops & their varieties cultivated in Bhiwani district.**

Crops	Varieties
Bajra	HHB -67, Proagro 9444, 86 M 32 , JK – 26 & Boss 456.
Guar	HG 365, HG 563, RG – 8, HG – 75 & locals
Cotton	RCH – 134, Shri Ram 6488, MRC 6304, HD-123 & H - 1226.
Mustard	RH – 30, T – 59 Laxmi, 45 J 51 & A.K.- 47.
Wheat	PBW – 343, WH – 711, WH – 147, Raj – 3765 and WH – 283.
Gram	HC-1, H-208, C-235, HC -5 & local .
Barley	BH-393 , BH-75 & locals

Source : DDA

## 4.6 Input Management

Besides improved seeds, the integrated nutrient, weed and pest management is essential to accelerate agricultural growth. At present, there exists a gap between the actual productivity and the attainable/achievable/potential productivity of the crops grown in the district. The proper and timely management of following inputs for crops is required to fill this gap.

### (a) Good quality seed

The most critical input is availability of good quality seed. The government agencies are trying their level best for assured supply of good quality seeds during the season but the farmers demand in the district always remain higher than it's supply. Therefore, the reputed private seed companies should be involved for making assured availability of good quality seed. The seed replacement rate varies from just 1.86 per cent in case of chick pea to 23.3, 38.8 and 43.05 percent in Wheat, mustard and bajra respectively.(Table 4).Recommendations are proposes for this sector

**Table 4. Seed replacement rate of important crops in Bhiwani district (2006-07)**

Sr. No.	Name of the crop	Area under crop (ha)	Present SRR ( %)
1.	Wheat	147000	23.3
2.	Bajra	178000	40.05
3.	Gram	67000	1.86
4.	Mustard	147000	38.8

Source: DDA

SRR = Seed Replacement Rate

### (b) Fertilizers

Fertilizer is second most important input for the cultivation of high yielding varieties. The farmers are well aware about the balanced fertilizer usage in different crops. However, they are concentrating mainly on application of nitrogen, phosphorus and zinc nutrients where as the deficiency of potash and micro-nutrients are badly affecting the productivity of crops in the district. Therefore, location specific integrated nutrient management, use of bio-fertilizers, FYM and vermi-composting are required to be popularized far wider adoption. The projected requirement of fertilizers during the plan period is given in Table 5.



Table 5. Projected Fertilizer Requirement (tonnes) in Bhiwani district during XIth plan

Sr. No.	Fertiliser Grade	Fertilizer used (tonnes) during 2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Total (tonnes)
1	Urea	58539	61000	64000	67200	70500	75000	337700
2	DAP	25342	29000	33000	37500	41000	45500	186000
3	MOP	262	310	370	440	520	610	2250
4	SSP	1900	2200	2500	2800	3100	3500	14100
5	NPK	513	600	700	800	1000	1500	4600
6	Zinc	40.65	100	170	200	250	350	1070

Source : DDA

### (c) Plant protection chemicals

The crop diseases, pests and weeds are other major problems in realizing optimum yield for all major crops in the district. The scrutiny of insect pests, diseases and weed control measures being adopted by the farmers reveal gross negligence on the part of farmers. The improper management of these control measures often results in to increased cost of cultivation without corresponding increase in yield. The farmers are depending mainly on chemical control with higher doses of chemicals. Hence, integrated measures for control of insect/pests, diseases and weeds control which are required to be adopted for sustainability and profitability of crops.

### 4.7 Farm Mechanization/Farm Equipments

The management of agriculture production system essentially involves effective management of timely completion of production operations. The use of mechanical power is thus becoming indispensable for making an optimal use of other resources and timely completion of various farm operations. Though the use of efficient farm implements mainly for soil tilling, sowing, threshing, zero-tilling, harvesting operations, etc is increasing but with increasing cropping intensity in the district, there is a great scope for

extensive use of the existing as well as other machinery like rotavator and laser leveler etc for higher production. The manufacturing units of farm machinery and implements are not adequate in the district. Therefore, it is required to encourage manufacturing agencies for the establishment of farm machinery manufacturing units in the district for making availability of low cost farm machinery to the farmers. The available farm machinery and implements in the district and projections for the plan period are given in Tables 7 and 8, respectively.

**Table 7. Availability of Improved Farm Equipments and Machineries**

Name of Improved Farm Implement/ Equipment/ Machinery	Farm Machinery available in the District	
	No. 20096	No. of Farmers 20087
Tractors	67	67
Harvester	9350	9350
Thresher	24	24
Reapar		

Source : DDA

**Table 8 . Farm Machinery Status and Projection during the plan period**

Sr. No.	Name of farm implements and farm machineries	Present Status (Nos.) (2006-07)	2007-08	2008-09	2009-10	2010-11	2011-12
1	Reaper binder	19	30	45	60	75	90
2	M. B. Plough	2	8	18	30	45	60
3	Rotavator	65	75	85	95	105	120
4	Seed-com-fertilizer drills	320	350	380	410	440	500
5	Tractor operated Spray Pumps	10	20	30	40	50	65
6	Zero till seed cum fertilizer drill	65	80	95	110	125	140
7	B.T. cotton seed drill	24	40	55	70	90	120
8.	Laser leveller	--	20	20	20	20	20
9.	Ridger seeder	--	40	80	120	160	200

#### **4.8 Special projects/Programmes on-going in the district**

##### **Agriculture**

<b>Sr. No.</b>	<b>Name of the scheme</b>	<b>Sector</b>
1.	Macro Management Mode (MMM)	Central
2.	Integrated scheme of oilseeds, pulses, oil palm & Maize (ISOPOM)	Central
3.	Mini Mission-II of Technology of Cotton (MM-II of TMC)	Central
4.	National Programme for Bio-Gas Development (NPBD)	Central
5.	ATMA	Central
6.	NFSM (Pulses & Wheat)	Central
7.	Generation of Additional employment for women farmer of SC categories	Central
8.	Strengthening of skills of Kisan clubs farmers	State
9.	Hariyali	Central
10.	National watershed Development project for rainfed area	Central
11.	Soil conservation works	State
12.	Land Levelling	State
13.	Land Reclamation	State

##### **Horticulture**

1.	National Horticulture Mission (NHM)	Central
2.	National Horticulture Board (NHB)	Central
3.	Micro Irrigation scheme (MIS)	Central & State

##### **Animal Husbandry**

1.	Integrated Murrah Preservation Programme	Central
2.	Foot & Mouth disease control Programme	Central
3.	Mini Dairy Scheme	State
4.	Calf rallies Programme	HLDB
5.	Women awareness Camps	HLDB
6.	Top quality buffalo calves purchase programme	HLDB

**Fisheries**

- |    |   |         |
|----|---|---------|
| 1. | Construction of New ponds & renovation of ponds | Central |
| 2. | Fisheries inputs                                | Central |
| 3. | Renovation of water logged area & prawn culture | Central |

**Krishi Vigyana Kendra**

- |    |   |         |
|----|---|---------|
| 1. | Farmers/ field staff trainings & other extension activities | Central |
| 2. | Vocational trainings for Rural unemployed youth             | Central |
| 3. | Conducting FLDS, OFTs & adaptive trails.                    | Central |
| 4. | Seed multiplication   | Central |

**(ii) Special beneficiary oriented schemes**

The following special beneficiary oriented schemes, Wage employment programmes and Area development programmes are being implemented in the district by DRDA, Bhiwani :

1. Swarnjayanti Gram Swarozgar Yojana (SGSY)
2. Jawahar Gram Samridhi Yojana (JGSY)
3. Rural Housing
  - i. New Construction and up gradation of unserviceable houses under IAY
  - ii. Credit-cum-subsidy Scheme for Rural Housing
4. Desert Development Programme (DDP)
5. Employment Assurance Scheme (EAS)
6. Pradhan Mantri Gramodaya Yojana (PMGY)
7. Members of Parliament Local Area Development Scheme (MPLADS)
8. Decentralized Planning (DCP)
9. Sampooran Gramin Rozgar Yojana (SGRY)

## **4.9 Constraint Analysis**

### **Yield gaps**

The reasons for the yield gaps and the interventions required are planned using participatory/consultative processes involving stakeholders. The natural factors of production including soil and water in Bhiwani district are slowing down in their responses to crops cultivation. The productivity of soils are deteriorating and ground water is lowering down in many areas of the district. Moreover, the quality of ground water is not good being brackish in nature. In recent years, the cropping intensity of the district has increased to 175 % thereby stress on soils increased for the supply of not only major nutrients but micro nutrients too. The poor availability of nutrients in soils is having a direct bearing on crop growth and finally on the quality of produce as grains, fruits, vegetables, fodder etc. It has recently been documented that nutrients deficiency in food and fodder has an adverse affect on the health of human beings and animal. The major reasons of gaps in yield of crops are poor carbon content in the soil, brackish ground water, increasing soil salinity and environmental stresses during the growth period of crops etc. The analysis of sustainability issues and reasons for gaps in the productivity of major crops grown the district are presented in Tables 9 and 10.

### **Constraints in Agricultural Progress**

The major obstacles affecting the progress and productivity of the district as identified by participatory approach are listed below.

- Risk of drought – crop losses or no sowing of crop due to drought in Siwani, Behal, Kairu, Loharu, Badhra and Tosham blocks
- Erratic canal water supply – Irrigation Intensity is below 125%
- Non availability of good quality irrigation water
- Poor soil water retention capacity
- Soil salinity and alkalinity problems
- Declining water table in all the blocks
- Depleting soil fertility particularly P, S, K, Zn.
- Inadequate availability of quality seeds
- Non-judicious use of fertilizers – Lack of basal application of fertilizers
- Low seed replacement rate

- Rising cost of agricultural inputs
- Rising problems of insect-pest and disease complex – Particularly Orobanche in raya
- Inadequate availability of quality fodder
- Problem in large and small ruminates
- Problems in agro-forestry – decreasing in no. of plants of Khejri and Sisham
- Farmers inability to invest.

**Table 9 Sustainability issues and gap analysis of productivity of different crops and resources**

S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<b>(A) CROPS</b>						
<b>1 Wheat</b>						
(i)	Timely seeding of wheat	Delayed harvesting of cotton, guar, basmati paddy availability of brackish ground water irrigation, low carbon content in soils	Zero tillage, Bt cotton, conjunctive use of irrigation water, direct seeding of basmati paddy, regulation on canal irrigation water supply and electricity	Extension and development agencies should jointly approach in a farmers' participatory approach for each of possible solution. Evaluating and refining the technology for critical stages of irrigation in sandy soils and efficient use of N fertilizer Testing of novel seeders in preparation for its commercialization e.g. Happy seeders.	Sowing at optimum time after bajra, cotton & guar & basmati paddy Selection of suitable and high yielding variety	Zero tillage will help : a) Improving soil health including soil biology b) Improved environment c) Less water use d) More productivity e) Less problem of <i>P. minor</i> & decreased use of herbicides f) Reduced cost of cultivation
(ii)	Seed treatment	Termites, fungal diseases like loose smut, flag smut and Karnal bunt	Seed treatment with insecticides, fungicides and bio-fertilizers. Seed priming if sowing is delayed	Awareness of farmers regarding importance of seed treatment by the University and the State Department of Agriculture	In all the blocks of the district	Productivity growth on sustainable basis
(iii)	Multiple nutrient deficiencies	Imbalance use of fertilizers. Poor residue retention on soil surface. No basal application of nitrogen,	Introduce more organic manures, more residue retention on surface, use of site specific micro-nutrient, use of N in three splits and use of first split before 1 <sup>st</sup> irrigation, integrate conjunctive use of organic and inorganic sources of nutrients generate fertilizer	Experimental research in different cropping systems, re-look at soil test values, change in the recommendation of practice	Use of more fertilizers in all the blocks.	The residue retention will help improving soil productivity, improved water retention in soil, less leaching of nitrogen

S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
			recommendations based on the principle of site specific nutrient management. The optimal use of existing (indigenous) nutrients coming from soil, organic amendments, crop residue and irrigation water. Apply fertilizer to fill the deficit between crop needs and indigenous supply. Management of pest diseases and weed problems through more appropriate nutrient management.			
(iv)	Varietal improvement	No variety to tolerate terminal heat, short duration variety produces less yield suitable variety for saline and sodic soils	Varieties with stay chlorophyll in top leaves near maturity, long duration varieties, varieties which can fit early sowing starting from 15 <sup>th</sup> Oct. to manage terminal heat at maturity	Pre-breeding, work on hybrid wheat. Improvement in the grain size of WH 542 & check lodging in WH-147	At least 40% area should be covered with varieties which can yield equal or more than WH 542 and PBW 343 Remaining 60% area should be covered with varieties WH-147, WH-416 and Raj-3765	More enhanced use of natural resources



S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
(v)	Management of salinity & alkalinity	Decreased yield in the drought year because of life saving irrigations with brackish water in <b>kharif</b> crops	Avoid irrigation with brackish water in drought years because it leads to secondary salinity, wherever available make conjunctive use of water. Tolerance of current and improved varieties to salinity and sodicity needs further investigations. Work is also needed to adapt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability, profitability and yield.	Bajra-wheat, guar-wheat, pulses-wheat cropping systems should be studied for long-term salinity and sodicity build-up due to water management in <b>kharif</b> season.	Whole district	Long-term productivity of wheat will sustain by proper water management in the system as a whole
(vi)	Weed management	Complex wheat flora seriously affects wheat yield in whole district.  Phalaris resistance will become a major problem and needs immediate attention for ecological solution.  Resistance buildup should be delayed or avoided.	Improve the efficiency of existing herbicides.  Introduce new herbicides.  Capacity building for spraying techniques.  Ecological approach including zero-tillage crop rotation.  Monitoring of resistance build up.  Germplasm management for competitive varieties	State level strategic plan for the management of <i>Phalaris minor</i> integrated. Capacity building of extension agencies and farmers for appropriate spraying techniques. On farm demonstrations of new herbicides	In all blocks of the district	Anticipated economic benefits are increased profitability, increased yield and increased food security.

S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<b>2 Cotton</b>						
(i)	Integrated pest management	Problem of Helicoverpa	Increase area under Bt cotton, monitoring of Bt cotton for resistance development, recommend agronomy for Bt cotton	More research is needed on agronomic management and resistance development, strategies to delay or avoid resistance development	80% area with assured irrigation	Better use of external inputs, less use of pesticides
(ii).	Quality seed	Non-descript Bt hybrids, poor quality seed	Better integration between public and private sector, double gene or triple gene Bt hybrids, better cycle of Bt upgrades, address problems that consumers may demand	More research on bio-technology, better understanding of IPR	The whole Bt cotton area	Provide higher yield with less pesticides, short crop duration thus enabling early wheat sowing
(iii)	Mealy bug	Availability of niches for carry over of pest	Precautionary measures for uprooting and burning, management of host and proper management strategies after occurrence	Integrated approach of good agronomic practices and monitoring	Whole cotton based cropping system in the district	More productivity and long-term decline in pest population
(iv)	Plant population	Hot and desiccating winds at sowing	Bed planting, irrigation management, use of seed-cum-fertilizer drill	Research at experimental farm and at farmers field for crop establishment techniques	Whole district	Better use of inputs, high efficiency
<b>3. Bajra</b>						
	Major thrust to consolidate the development of bajra hybrids of short duration with high yield potential	New hybrids from private sector have been introduced with unknown consequences leading to disease incidence	Main streaming of private sector and developing MOUs with private sector	Pre-breeding research at experimental stations	Whole district	Will meet the requirement of feed and fodder at the cost of less resources

S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<b>4 Mustard</b>						
	Maximizing the economic benefits to farmers	Less use of sulphur nutrition, no management of Orobanchae, no green manuring	Research on integrated nutrient management specially when farmers are using more phosphorus than recommendation, research on management of Orobanchae	Basic research on seed bank recruitment of Orobanchae and INM	Whole district	The leading edge of Haryana can be maintained by proper nutrition and pest management in Indian mustard
<b>5. Gram</b>						
	High incidence of pod borer	Management of Pod borer	Adopt spray schedule to control pod borer	Training, result & method demonstration	20% growth in area under control of pod borer every year	Increase in yield
	Less use of phosphatic fertilizers and bio fertilizers	Grown on marginal land, farmers do not use fertilizer due to uncertainty of the crop	Awareness regarding role of phosphatic and bio fertilizers in yield increase	Training, demonstration and field day	20% growth area under phosphatic and bio fertilizers every year	Increase in productivity
<b>6. Castor</b>						
	Quality seeds of castor hybrid	Linkages and synergies with private sector will be developed for availability of hybrid seed of castor	DDA will ensure the availability of quality seed of castor hybrid seeds	-	-	-
<b>B. Diversification</b>						
(i).	Reduced bio-diversity due to large area under non legume cropping systems	High risk associated with legume crops, more insect-pest problems in pulses, availability of high yielding varieties of crops other than pulses	Develop alternate strategy to introduce pulses in the multiple land use system	Growing of bajra and guar/cowpea as fodder during summer	Whole district	Improvement in soil health and availability of fodder for animal

S.N.	Gaps	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
(ii)	Intercropping of guar, moth, moong with castor	Risk of frost injury to castor.	Use of castor hybrids & keeps 4 – 5ft distance between lines.	Farmers' participatory approach	Twenty five per cent guar area can be sown with castor as an intercrop	More conservation of resources, multiple land use, getting more with less
<b>(C) Water management</b>						
	Reduced water use efficiency	Poor rain and irrigation water management, brackish ground water, undulating land, high rate of evaporation	Introduction of micro-irrigation, water harvesting, introduction of watersheds,	Demonstrations, development and research	Whole district	Savings in water, improved water use efficiency, better water-nutrient interactions
<b>(D) Integrated pest management</b>						
(i)	Weed management in wheat	Development of resistance in <i>P. minor</i> , cross resistance	Accelerated adoption of zero tillage, mechanized weeding using bed planting system, more competitive varieties, bringing 10% area at each farm level under alternate crops, rotation of herbicides of different chemistries,	Basic research on the mode and genetics of resistance, release of competitive varieties, monitoring of resistance development	Whole district	Sustained productivity of wheat, reduction in herbicide use, better use of natural resources
(ii)	Orobanchae in mustard	The monoculture of Indian mustard	Introduction of castor and barley	Research on castor hybrids and two-row barley, research on longevity of Orobanchae	Whole district	Oilseed sustainability can be ensured through long-term approach leading to reduction in seed bank of Orobanchae
(iii)	Emergence of new pests	Availability of monoculture systems and intensive cropping	Intensive research on crop ecology and biological control, research on bio-technology	Basic research on ecology, biological control	Whole district	Avoid emergence of new pest problems and reduction in pesticide use

**Table 10. Activity Output Matrix (Log Frame Summary)**

Sr . No.	Thrust Areas (where gaps exist)	Weaknesses	Solutions	Concerned Agencies	Approach
1	Seed Production	1. Seed planning	Participatory selection of improved varieties of crops at farmers' field.	DDA	Table-11,12,42 & 43
			Motivating farmers to produce the seed of best varieties.	DDA	
			Surveying the yield performance of varieties/hybrids in each crop. Presenting data of best performed variety.	KVK	
		2. Best quality seed	Deleting varieties/ hybrids with low yields in any current season.	DDA	Table-13
			Mandatory testing of new variety hybrids through KVK's.	KVK	
		3. Seed treatment	Chemical and non-chemical treatment	DDA	Table-11 ,12 & 17
			Capacity building resource person/extension agencies/seed	DDA (Data for all the	

			companies/farmers	above activities will be presented in the AOs workshop)	
2	Wheat seed replacement	Low productivity/ production of wheat due to sowing of low yielding varieties in larger areas	To motivate farmers to purchase seed of high yielding varieties	DDA	Proposed seed production project in the plan
			HSDC should make the availability of seed of high yielding wheat varieties.	HSDC	
			DDA will develop strong linkages with private seed companies for the assured supply of good quality seed of high yielding varieties.		
			DDA will ensure for the replacement of wheat seed in about 15 thousand hectare area during the plan period		
3	Reclamation of saline/sodic soils	About 10,000 hectare area is affected by salinity/ sodicity. Low productivity of crops in saline/ sodic	Reclamation will be done by farmers in about 10 thousand hectare area by gypsum to be purchased on 75% subsidy through co-	DDA	Table-36

		soils	operatives. DDA will make necessary arrangements/ linkages with gypsum supplying agencies for timely availability of gypsum in co-operatives etc.		
			KVK will provide technical guidance to farmers by organizing trainings and field demonstrations	KVK	
4	Laser leveling (canal irrigated areas)	Poor use of Laser land leveling for water saving, land saving and improved yields of bajra, wheat and barley crops	DDAs will lay out demonstrations on bajra, raya and wheat in each block. DDAs will also record data on water saving and yield penalty if any will also be recorded while recording data on yield.	DDA	Table-15 &41
			DDAs will organize and monitor the distribution of laser leveler specially on custom hire services.	DDA	
			(The data will be discussed in joint meeting of KVK		

and DDAs. The presentation of final data will be made by DDA).

DDA will also ensure the exposure visit of farmers on sites already demonstrated by KVKs. DDA

(Two way subsidy to farmers who are using custom hire services, may be given subsidy on the charges on hour basis. The service provider can be given subsidy if it is passed on to the user farmers).

5	Green manuring	To improve crops productivity and soil health.	DDA will ensure the timely availability of dhaincha seed at 75% subsidy. About 60per cent of net sown area will be covered during the plan period of five years.	HSDC/DDA/ HAFED/HLRDC	Table 40
6	Water management	(i) Poor adoption of in-situ rain water harvesting techniques		DDA	Table-35



7	Site specific nutrient management	(ii) Poor availability/ management of community ponds	Popularization of in-situ rain water harvesting through broad beds and furrows method etc	DDA/ Concerned departments in consultation with KVK	Table-14
		(iii) Non judicious utilization of brackish water for irrigation	Developing of community ponds for drip irrigation system	DDA	
			Basal application of fertilizers and top dressing of N with reference to irrigation	Popularization of judicious use of brackish water through demonstrations on alternate use of brackish water	
8	Integrated Pest	Bio-fertilizers	Fertilizer application will be based on the principles of SSNM which includes yield gap analysis, guidelines for regional protocol etc.	DDA/KVK	Table-16 &33
		Poor management of insect-pests and	Efficient use of inoculant bio-fertilizers. Higher nutrient use efficiency through inoculation with biofertilizers of bajra, guar,	DDA/KVK	

9	Management (IPM)	diseases in cotton, (Mealy bug) bajra, gram and vegetables.	wheat and gram seeds.		
		Management of molya disease in wheat	Monitoring of resistance development.	KVK	
		Quantification, characterization and management of resistance of key pests against insecticides in vegetables.	Strengthening of chemical control and agronomic management. Resistant varieties	KVK	
		Monitoring of insecticides pattern in Bt. Cotton	Plant clinic labs for KVK		
	Integrated Weed Management (IWM)	Management of wheat aphid	DDA/concerned departments in consultation with KVK		Table-16 &58
		Poor spraying techniques and low efficiency of herbicides	Diagnostic Kit for purity of Bt. Cotton.		
		Monitoring of herbicide resistance	Improving spraying techniques for increasing efficiency of herbicides through survey & demonstrations	KVK	

10	Timely seeding of crops	Non availability of assured good quality irrigation water and untimely rains and irregular supply of electricity supply for tube wells	Demonstrations  Survey & Demonstrations	DDA/KVK/ HSEB  DDA/KVK	Table-13 & 18
11	Farming system through dairy	Lack of farming systems units. Need to establish commercial dairy farming units along with suitable cropping	Research, extension, development agencies and HSEB should jointly work in a farmers' participatory approach for each of possible solution.  (The technology need to be further developed for bajra- raya, bajra-wheat, guar- raya and bajra-barley cropping systems)  DDAHs , lead bank and	DDAH/KVK	Table 58

systems Improving the infrastructure facilities for procurement of milk.	KVKs will initiate action for establishment of dairies by selecting appropriate sites depending on market strategies. To extend existing facilities of milk procurement and chilling plants in all the villages.	DDAH  DDAH	
Strengthening of facilities for creation of milk processing units. Facilities for creation of silage and hay making	Milk processing units may be created/ strengthened at block level.	DDAH/KVK	
Creation of facilities for drinking water for animals. A.I. and natural service through community bulls (Private Public Interface)	Water harvesting and desilting of village ponds  Private Public linkages and synergies be created. Retail outlets may also be associated with productivity improvement through A.I. and natural services.	DDA/KVK  DDAH/KVK	Table-51  Table-45 ,47 & 48
Reduction of calving		DDAH/KVK	

		<p>period – by adopting mineral mixture feeding and balanced feed, de-worming, summer management, unestrus management, free hormone therapy for repeat breeder of resource poor.</p> <p>Diagnostic kits for diseases, vaccination as regular feature, survey and surveillance of diseases and creation of drug banks for common ailment.</p>	<p>Creation of facilities for cattle feed and mineral mixture through co-operatives. DDAH and disease diagnostic labs to formulate common strategies for disease forecasting and management.</p> <p>Procurement of special kits like cryoscopes, mastitis diagnostic kit, foot and mouth diagnostic kit etc.</p>	DDAH	Table -34
12	Intercropping of castor + guar, castor + moong castor + moth			DDA/KVK	Table -38
13	Zero-tillage in bajra, guar and cotton based cropping system	To increase cropping intensity, use efficiency of water and nutrients and higher production per unit area.	Popularization of agro-technology of castor + guar intercropping for adoption by the farmers	DDA/KVK	Table -15

14	Fodder Production (Napier grass) with drip irrigation	Increasing cost of cultivation of crops, falling water table and deterioration in soil productivity.	DDA/KVK will motivate farmers for the adoption of zero tillage technology through participatory research/demonstrations on bajra, guar and cotton based cropping systems for the saving of tillage, irrigation water, fertilizers, pesticides.	DDA	Table-39
15	Sulphur nutrition in mustard	Non availability of green fodder for animals. Scarcity of irrigation water for fodder production.	DDA will monitor the subsidy (50%) on drip irrigation system and also arrange the source and supply of napier grass root cuttings for planting in about 1000 ha area during the plan period. Popularization of technology of napier grass cultivation for adoption by the farmers	DDA/KVK	Table -37 Table-14 & 58
16	Orobanchae in mustard	Application of sulphur through gypsum in 1.0 lac hectare area of mustard during the plan period.	To create awareness among the farmers for timely application of gypsum for the supply of sulphur for higher oil and seed yields of mustard.	DDA KVK	

Mono cultivation of  
mustard

DDA will ensure for the  
introduction of castor and  
barley in rotation

KVK and research  
scientists will study the  
effects of castor hybrids  
and two-row barley on  
longevity of Orobanche

**4.10 Recommended interventions in the district with detailed action plan with cost.**

**Table 11 Training Proposed for Capacity Building of Agriculture Staff**

Name of the Department	Year wise no. of staff to be trained (Phy- No. , Fin. – Rs in lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
<b>Agriculture</b>	500	3.0	500	3.0	500	3.0	500	3.0	500	3.0	2500	15.0
<b>Cooperative &amp; NGOs</b>	200	1.2	200	1.2	200	1.2	200	1.2	200	1.2	1000	6.0
<b>PRI Staff &amp; Others</b>	100	0.6	100	0.6	100	0.6	100	0.6	100	0.6	500	3.0
<b>Total</b>	800	4.8	800	4.8	800	4.8	800	4.8	800	4.8	4000	24.0

**Cost norms – Rs 600/ trainee/day**



**Table 12 Training Proposed for Capacity Building of Farmers on different technologies** (Phy- No. , Fin. – Rs in lacs)

Technology / Aspect	Year wise no. of farmers to be trained											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
INM	1500	6.0	1500	6.0	1500	6.0	1500	6.0	1500	6.0	7500	30.0
NRM	500	2.00	500	2.00	500	2.00	500	2.00	500	2.00	2500	10.0
IPM	1200	4.8	1200	4.8	1200	4.8	1200	4.8	1200	4.8	6000	24.0
RCTs	1200	4.8	1200	4.8	1200	4.8	1200	4.8	1200	4.8	6000	24.0
Water management	1500	6.0	1500	6.0	1500	6.0	1500	6.0	1500	6.0	7500	30.0
Post Harvest Management	250	1.0	250	1.0	250	1.0	250	1.0	250	1.0	1250	5.00
Credit marketing &	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
Seed Production	1500	6.0	1500	6.0	1500	6.0	1500	6.0	1500	6.0	7500	30.0
2500Farm waste and crop residue management	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
Vermi-composting	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
Farm Mechanization	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
Renewable energy	100	0.40	100	0.4	100	0.40	100	0.40	100	0.40	100	0.40
Exposer visits	500	25	500	25	500	25	500	25	500	25	2500	125
<b>Total</b>	<b>9950</b>	<b>62.8</b>	<b>9950</b>	<b>62.8</b>	<b>9950</b>	<b>62.8</b>	<b>9950</b>	<b>62.8</b>	<b>9950</b>	<b>62.8</b>	<b>49750</b>	<b>314.0</b>

Cost norms= Rs. 400/ trainee /day

**Table 13 Varietals Demonstration in Next Five Year**

Crop	Area under each demon.	Varietals Demonstration Projection (Phy- Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
<b>Bajra</b>	<b>0.4</b>	1500	75.0	1500	75.0	1500	75.0	1500	75.0	1500	75.0	7500	375.0
<b>Cotton</b>	<b>0.4</b>	200	10.0	200	10.0	200	10.0	200	10.0	200	10.0	1000	50.0
<b>Jowar</b>	<b>0.4</b>	500	25.0	500	25.0	500	25.0	500	25.0	500	25.0	2500	125.0
<b>Guar</b>	<b>0.4</b>	700	35.0	700	35.0	700	35.0	700	35.0	700	35.0	3500	175.0
<b>Paddy</b>	<b>0.4</b>	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
<b>Castor</b>	<b>0.4</b>	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
<b>Wheat</b>	<b>0.4</b>	1500	75.0	1500	75.0	1500	75.0	1500	75.0	1500	75.0	7500	375.0
<b>Raya</b>	<b>0.4</b>	1000	50	1000	50	1000	50	1000	50	1000	50	5000	250.0
<b>Gram</b>	<b>0.4</b>	400	20.0	400	20.0	400	20.0	400	20.0	400	20.0	2000	100.0
<b>Barley</b>	<b>0.4</b>	500	25.0	500	25.0	500	25.0	500	25.0	500	25.0	2500	125.0
<b>Oat &amp; Barseem</b>	<b>0.4</b>	800	40.0	800	40.0	800	40.0	800	40.0	800	40.0	4000	2.00
<b>Total</b>		<b>7200</b>	<b>360.0</b>	<b>7200</b>	<b>360.0</b>	<b>7200</b>	<b>360.0</b>	<b>7200</b>	<b>360.0</b>	<b>7200</b>	<b>360.0</b>	<b>36000</b>	<b>1800.0</b>

Cost norms= Rs. 5000/ ha.

**Table 14 INM Demonstration in Next Five Years**

Crop	Area under each demon.	INM Demonstration Projection (Phy- Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
<b>Bajra</b>	<b>0.4</b>	1500	75.0	1500	75.0	1500	75.0	1500	75.0	1500	75.0	7500	375.0
<b>Cotton</b>	<b>0.4</b>	200	10.0	200	10.0	200	10.0	200	10.0	200	10.0	1000	50.0
<b>Jowar</b>	<b>0.4</b>	400	20.0	400	20.0	400	20.0	400	20.0	400	20.0	2500	125.0
<b>Guar &amp; Mung</b>	<b>0.4</b>	1000	50.0	1000	50.0	1000	50.0	1000	50.0	1000	50.0	5000	250.0
<b>Paddy</b>	<b>0.4</b>	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
<b>Castor</b>	<b>0.4</b>	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
<b>Wheat</b>	<b>0.4</b>	2000	100.0	2000	100.0	2000	100.0	2000	100.0	2000	100.0	10000	500.0
<b>Raya</b>	<b>0.4</b>	1500	75.0	1500	75.0	1500	75.0	1500	75.0	1500	75.0	7500	375.0
<b>Gram</b>	<b>0.4</b>	1000	50.0	1000	50.0	1000	50.0	1000	50.0	1000	50.0	5000	250.0
<b>Barley</b>	<b>0.4</b>	500	25.0	500	25.0	500	25.0	500	25.0	500	25.0	2500	125.0
<b>Oat &amp; Barseem</b>	<b>0.4</b>	600	30.0	600	30.0	600	30.0	600	30.0	600	30.0	3000	150.0
<b>Total</b>		<b>8800</b>	<b>440.0</b>	<b>8800</b>	<b>440.0</b>	<b>8800</b>	<b>440.0</b>	<b>8800</b>	<b>440.0</b>	<b>8800</b>	<b>440.0</b>	<b>44000</b>	<b>2200.0</b>

Cost norms= Rs. 5000/ ha.

**Table 15 Démonstrations on Resource Conservation Technologies**

Technologies	Area under each demon.	RCTs Demonstrations Projection											
		(Phy- Area covered in ha, Fin – Rs. In lakh)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy	Fin.	Phy	Fin.	Phy.	Fin.
Laser leveling	<b>0.4</b>	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	<b>500</b>	<b>25.0</b>
Bed planting	<b>0.4</b>	100	5.0	100	0.5	100	0.5	100	0.5	100	0.5	<b>500</b>	<b>25.0</b>
Green manuring	<b>0.4</b>	1500	75.0	1500	75.0	1500	75.0	1500	75.0	1500	75.0	<b>7500</b>	<b>375.0</b>
Direct seeding of paddy	<b>0.4</b>	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	<b>250</b>	<b>12.5</b>
Zero tillage	<b>0.4</b>	100	5.0	100	0.5	100	0.5	100	0.5	100	0.5	<b>500</b>	<b>25.0</b>
<b>Total</b>		<b>1850</b>	<b>92.5</b>	<b>1850</b>	<b>92.5</b>	<b>1850</b>	<b>92.5</b>	<b>1850</b>	<b>92.5</b>	<b>1850</b>	<b>92.5</b>	<b>9250</b>	<b>462.5</b>

**Cost norms= Rs. 5000/ ha.**

**Table 16 IPM Demonstrations in Next Five Years**

Crop	Area under each demon.	IPM Demonstrations Projection (Phy- Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin	Phy	Fin.	Phy	Fin	Phy.	Fin.
Cotton	<b>0.4</b>	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	<b>500</b>	<b>25.0</b>
Guar & Mung	<b>0.4</b>	120	6.0	120	10.0	300	15.0	350	17.5	400	20.0	<b>600</b>	<b>30.0</b>
Paddy	<b>0.4</b>	30	1.5	30	1.5	30	1.5	30	1.5	30	1.5	<b>150</b>	<b>7.5</b>
Wheat	<b>0.4</b>	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	<b>500</b>	<b>25.0</b>
Gram	<b>0.4</b>	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	<b>500</b>	<b>25.0</b>
Raya	<b>0.4</b>	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	<b>500</b>	<b>25.0</b>
<b>Total</b>		<b>550</b>	<b>27.5</b>	<b>550</b>	<b>27.5</b>	<b>550</b>	<b>27.5</b>	<b>550</b>	<b>27.5</b>	<b>550</b>	<b>27.5</b>	<b>2750</b>	<b>137.5</b>

Cost norms= Rs. 5000/ ha.

**Table 17 Seed Treatment Demonstrations in Next Five Years**

Crop	Area under each demo.	Demonstrations Projection (Phy- Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin	Phy.	Fi n.	Phy.	Fin.	Phy.	Fin.
Wheat	<b>0.4</b>	20000	50.0	20000	50.0	20000	50.0	20000	50.0	20000	50.0	<b>100000</b>	<b>250.0</b>
Gram	<b>0.4</b>	10000	25.0	10000	25.0	10000	25.0	10000	25.0	10000	25.0	<b>50000</b>	<b>125.0</b>
Cotton	<b>0.4</b>	2000	10.0	2000	10.0	2000	10.0	2000	10.0	2000	10.0	<b>10000</b>	<b>50.0</b>
<b>Total</b>		<b>32000</b>	<b>85.0</b>	<b>32000</b>	<b>85.0</b>	<b>32000</b>	<b>85.0</b>	<b>32000</b>	<b>85.0</b>	<b>32000</b>	<b>85.0</b>	<b>160000</b>	<b>425.0</b>

Cost norms= Rs. 250/ ha for wheat & gram & Rs. 500/ ha for cotton

**Table 18 Farmer Field Schools covering identified critical technologies in Next Five Years**

Crop	Farmer Field Schools Projection (Phy – No. of field school, Fin – Rs. In lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin.	Phy.	Fin.	Phy.	Fin	Phy	Fin.	Phy	Fin	Phy.	Fin.
Wheat	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	<b>100</b>	<b>20.0</b>
Paddy	3	0.6	3	0.06	3	0.06	3	0.06	3	0.06	<b>15</b>	<b>3.0</b>
Guar & Mung	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Cotton	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Bajra	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Gram	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Raya	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Barley	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Castor	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	<b>10</b>	<b>2.0</b>
<b>Total</b>	<b>85</b>	<b>17</b>	<b>85</b>	<b>17</b>	<b>85</b>	<b>17</b>	<b>85</b>	<b>17</b>	<b>85</b>	<b>17</b>	<b>425</b>	<b>85.0</b>

**Cost norms= Rs. 0.2/lacs /FFS.**

**Table 19 Group formation /Commodity interest groups formation for specific activities**

Interest Group(s)	Group Formation Projection Plan											
	Phy – No. of groups to be formed, Fin – Rs. In lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Ph y.	Fin.	Phy.	Fin.	Phy.	Fin	Phy	Fin.	Phy	Fin	Phy.	Fin.
Seed production	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Water user	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Organic Farming	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Value addition	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Specific Crop group	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Total	40	8	40	8	40	8	40	8	40	8	<b>200.0</b>	<b>40.0</b>

Cost norms- Rs.0.20 lacs/group (for capacity building, input assistance, marketing and for group specific activities)

## 4.11 Projected outcome and growth rate during the plan period

**Table 20 Area, production and Productivity Trend of Main Crops in District in next Five years (Area – ha, Production – 000 q, productivity – q/ha)**

Sl. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08 (Projected)			2008-09 (Projected)			2009-10 (Projected)			2010-11 (Projected)			2011-12 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Wheat	127500	437.8	34.34	127000	450.8	35.5	126500	468.0	37.0	126000	478.8	38.0	125500	489.5	39.0	125000	500	40.0
2	Raya	161318	183.2	11.36	158000	186.4	11.8	156000	190.0	12.2	154000	196.0	12.75	152000	201.4	13.25	150000	210	14.0
3	Paddy	12000	19.2	16.0	12000	19.92	16.6	12000	20.76	17.3	12000	21.6	18.0	12000	22.44	18.7	12000	23.40	19.5
4	Bajra	189230	192.0	10.15	186000	195.0	10.5	182000	200.0	11.0	178000	205.0	11.5	174000	209.0	12.0	170000	213.0	12.5
5	Guar	70000	49.0	7.0	72000	52.5	7.3	74000	56.2	7.6	76000	60.8	8.0	78000	66.3	8.0	80000	72.0	9.0
6	Cotton	32000	11.23	3.51	32600	12.0	3.7	33200	12.8	3.85	33800	13.5	4.0	34400	14.5	4.20	35000	15.5	4.40
8	Jowar (foddar)	2865	57.3	200	3500	73.5	210	4100	92.2	220	4700	108.0	230	5300	127.2	240	6000	150	250
9	Gram	73550	54.4	7.40	73800	55.3	7.5	74100	57.8	7.8	74400	61.0	8.2	74700	63.5	8.5	75000	66.0	8.8
10.	Barley	4836	13.1	27.24	8000	22.4	28.0	11000	31.9	29.0	14000	42.0	30.0	17000	52.7	31.0	20000	64.0	32.0



## CHAPTER V

# ALLIED AGRICULTURAL SECTORS

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### 5.1 Introduction

Allied agriculture sectors continue to occupy a significant role in the district. The allied sectors of agriculture which is a combination of different activities like horticulture, animal husbandry, fisheries, watershed development, social forestry, food processing, agro based industries, agricultural marketing, agricultural credit, etc contributes significantly in the economy of the district. The allied sectors indicate good potential to continue to contribute in the development of over all economy of the district.

### 5.2 Horticulture

The agro climatic conditions of the district are favorable for fruits and vegetable crops. The major fruit crops grown in the district are citrus, belgiri, guava, ber and aonla covering only 125 ha area. The major vegetable crops grown in an area of 5344 ha were tomato, carrot, cauliflower, radish, chillies, brinjal, cucurbits and leafy vegetables etc with total production of 64767 MT during 2006-07. It is proposed to increase the area under fruit and vegetables to 8000 ha during the plan period (Table 22). The existing orchards are also proposed to be rejuvenated (Table 23) for obtaining higher production. In order to increase the production of fruits and vegetables in the district and for additional income, the farmers are required to adopt naturally ventilated poly house/poly tunnels for nursery raising, drip Irrigation in fruits and vegetables, to cover more area under hybrids of vegetables and less water requiring onion. The proposals on the following activities of horticulture are projected for achieving targeted growth rate during the XIth plan.

1. Naturally ventilated poly house/poly tunnels for nursery raising
2. Area under less water requiring onion
3. Drip Irrigation
  - Fruit plants
  - Vegetable Crops

### **5.3 Vermi-composting**

It is established fact that use of vermicompost in crops promotes faster growth of plants. It increases water-holding capacity of soil, reduces salinization and soil erosion, induces resistance in plants against pest and diseases and increases soil productivity thereby higher crop yields. Hence, it is required to promote the use of vermicompost for sustainable crop production.

### **5.4 Beekeeping**

Decreasing size of land holdings and increasing cost of production is a great concern for farmers. In order to increase the income of farmers, beekeeping has become quite popular as side business with agriculture. Mustard crop has proved to be good resource for the bee keepers of this district. Therefore, this profession can increase both income and production of mustard crop to 20-30% by cross pollination.

### **5.5 Mushroom cultivation**

Presently only 7 units of mushroom are functioning with an area of 1400 trays. However, farmers of the district are interested to adopt mushroom farming as a subsidiary occupation for additional income generation.

### **5.6 Animal Husbandry**

Animal Husbandry has been the main allied sector occupation of the farmers alongwith agriculture since ages and has significantly contributed to the economic stability of the peasants of Haryana.

Rearing of livestock e.g. buffalo, cow and goat are an integral part of the farming system of the district and form basis for ensuring improved livelihood and economic sustainability of the farming families of the area.

Increased demand for food grains, weather conditions with extreme high and low temperatures and low average rainfall (about 350 mm), Limited irrigation facilities and large area under rainfed conditions limits the fodder production and availability in the district & hampers. The milk productivity and its economic viability. Further imbalanced feeding using few ingredients (costly) in the ration of dairy animals decreases the profitability of the dairy farmers.

On the other hand the easy access to the expanding market and rise in demand for diverse animal products show an opportunity for further strengthening of this allied sector in the district with wide network of infrastructural and support services. This sector's vast

potential can be harvested for growth in employment and income and further adding organic matter to soil to improve its health too.

### **Dairy Development**

Dairy is an essential component of rural areas of the district. There is a long tradition of rearing dairy animals by the farmers in the district. Large number of landless families are also engaged in animal rearing. There are 93510 numbers of cattle and 441647 numbers of buffaloes in the district as per cattle census (2003). The numbers of cross bred cows are 10840 which are almost half of the number of indigenous cows. The choice of the farmers is however buffalo. As per latest cattle census the numbers of dairy animals are showing a declining trend but there is visible improvement in the stock of these animals. Enhanced farmers interest and thrust of animal husbandry department and other government departments and other agencies has been helpful in increasing milk yield in the district and average per capita milk availability in the State has gone upto 660 gram per day. There exists wide gap between the average milk yield and attainable yield and/or potential yield which offers scope for improvement in productivity. The existing gaps in the quality of germplasm, low reproductive efficiency, shortage of quality feed and fodder, imbalanced feeding practises inadequate disease, and other manage mental practises, can be addressed through by adopting improved animal husbandry practises. The stock/germplasm gap can be tackled through efficient A.I. services and supply of known pedigree bulls. The low success rate of A.I. can be improved by giving proper training to the parastaff (VLDA's) of the Animal Husbandry department. Creation of A.I. training facilities/infrastructure at district/resgional level or at CCS HAU Hissar can be looked into. This A.I. training to atleast 1 person of each village can be a tool for employment generation as well as fast improving the germplasm through A.I. The advanced kit is crysto scope for detecting proper time of conceiving can be great help in

A.I. services. The gap of milk yield can be bridged through availability of green fodder and balance feeding along with mineral mixture supplementation. The macro and micro-nutrient deficiency in soil is also affecting the productivity of these animals which is to be rectified through quality fodder production with complete fertilizer nutrient application based on soil testing/detailed mapping of soil for mineral status. The high calf mortality and other disease menace would effectively be checked by starting extensive campaigns e.g timely (early) feeding of colostrums and deworming of calves. Proper feeding with special emphasise on protein availability needs to be addressed in case of heifers for achieving early sexual maturity and calving. Malnutrition of animals especially of resource poor farmers can be tackled by providing complete feed blocks which can be prepared by using both locally available and unconventional feed stuffs. For effective disease control the veterinary services are to be strengthened by providing different improved diagnostic kits for mastitis, F& M etc. and providing mobile hospital vans for door step services to the farmers.

The existing schemes and programmes for improvement of health of animals and enhancing milk productions are planned to be supplemented under RKVY through organising different extension activities for farmers and technical staff and formulation of special projects mentioned in the chapter VI.

### **Poultry Development**

Poultry farming through considered to be a subsidiary occupation to agriculture yet it has established itself as one of the important independent commercial activity in the district. Harsh climate, less infrastructural facilities, fluctuating & distant market are a deterrent to the rapid growth of poultry in the district. As per 2003 animal census there were 275895 poultry birds in the district and out of which 229616 and 46279 were broilers and layers,

respectively. Though the facility of disease investigation lab in the KVK is of much help in the disease management & control, the farmers are unable to seek benefits from this unit on account of lack of awareness and lack of permanent scientific & technical staff in position in the lab. The demand for day old chick is generally being met by the private hatcheries. The rising feed cost is another major issue facing poultry farmers. In spite of all round developments, there is a segment of poultry sector which is unorganised and spread over in the form of small farms in villages which require efforts for exploiting the potential.

### **Promotion of back yard poultry**

A small number of farmers especially the landless and other disadvantageous farmers are having a few birds as back yard poultry. This form of poultry farming needs institutional support for its success as the productivity is quite low in these cases. The improved strains for this type of farming (e.g. vanaraja and gramapriya) together with their production packages are required to be delivered to the farmer doorstep for healthy growth of this type of poultry which is having an assured nutritional supply and a sizeable return with no or little extra cost to the farm family. The extension services, training and marketing needs of both types of poultry farming are to be effectively addressed in the plan.

The growing urbanisation , increasing demand for poultry , meat and eggs and expanding poultry units would get a boost if a marketing / poultry hub can be developed in the region/this side of state near Delhi as of now there is no marketing center of these products in the area as of now resulting in vast fluctuation in the price.

## **Sheep, Goat and Piggery Development**

Sheep, goat and pig have an important role in the sustenance and livelihood security of a section of farmers and land less rural. The rearing of these animals is having potential for poverty alleviation with low risk. With the availability of few open pastures in the district, sheep and goat rearing is not feasible in a big way. However, promoting small units as subsidiary to the agriculture by land less labourers and those traditionally engaged in such activities is quite feasible. The improved strains of goat & sheep with semi-intensive feeding system, parasitic control measures and promotion of good management practices can ensure healthy economic return to the farmer. Under the plan a small percentage of willing land less farmers would be persuaded to go for rearing of 2 to 4 goats (especially Barbari and/ or another suitable breed). This will be low cost , no risk moderately income generating activity with nutritional security for the family. Just like back yard poultry , this activity can be under taken on a limited scale which have un exploited market potential in and around the village itself. Recently piggery has generated interest as an important economic activity in the district and individuals have been approaching for training to staff this occupation. With increasing urbanization, the supply of pig feed can be assured from hotels and restaurants wastes. The improvement in transportation facilities and ready assured markets in national capital of Delhi brightens the scope for its growth in the district.

The extension activities proposed for modern pig farming especially on improved strains, general health and disease management practices can boost the pig farming in the district.

### **5.10 Fisheries**

The fish cultivation in Bhiwani district is done mainly in Gram Panchayat Tanks spread over an area of 719.98 ha. The total fish production in the district during 2006-07 was 2483 tonnes.

### **5.11 Social Forestry**

The area under state forests in the district is 3442 hectares. There is less than one percent of total geographical area of district under forest cover. The xerophytic type of flora dominates in the district. The district is inadequately wooded and some parts are practically bare of trees. Tree species found are khairi, jand, pahari kikar, kikar, dhok, babool, rohera, janti or reru, jai or van, beri, barh, pipal, lasura, imli, barna, shisham, siris, neem, farash, henna, papri, gular, indokh, tut, gulmohar etc are found all over the district. Jand and jai are the dominant species of the sandy areas. Shrubs found in the district are pala, hins, Puthkanda, bansa, panwar, karia, khip, Aak, phog and Nagphani. Amarbel is a common parasite climber. The palatable grasses like anjan, dhaman and dub have dwindled due to excessive grazing in village common land. Jand, neem bakain, khairi, mesquite or pahari kikkar, henna and eucalyptus have been planted to increase the forest wealth.

### **5.12 Development of rural industries**

Bhiwani is an industrially backward district and there is no big industrial unit in the district. However, there are 2569 SSI units in the district which provided employment to about 7857 people.

### **5.13 Agricultural marketing**

The details of basic marketing infrastructure for post harvest management of agriculture produce are given in Table 1.

### **5.14 Agricultural credit**

The total number of credit institutions spread over the district are 151. The total loan distributed by these credit institutions to farmers and others during 2006-07 was Rs. 22806 lacs

### **5.15 Farmers organizations**

At present about 1143 self help groups are functioning in 444 villages involving about 12500 members. However, no Farmers Clubs, Krishi Vigyan Mandals and Community Groups are functioning in the district.

### **5.16 Service Centers**

The Public, Private and Cooperative sector centers presently providing service to the farmers in the field of Agriculture and its' allied fields are given in Table

### **5.17: Special projects/Programmes on-going in the district**

#### **Agriculture**

<b>Sr. No.</b>	<b>Name of the scheme</b>	<b>Sector</b>
1.	Macro Management Mode (MMM)	Central
2.	Integrated scheme of oilseeds, pulses, oil palm & Maize (ISOPOM)	Central
3.	Mini Mission-II of Technology of Cotton (MM-II of TMC)	Central
4.	National Programme for Bio-Gas Development (NPBD)	Central
5.	ATMA	Central
6.	NFSM (Pulses & Wheat)	Central
7.	Generation of Additional employment for women farmer of SC categories	Central
8.	Strengthening of skills of Kisan clubs farmers	State
9.	Hariyali	Central
10.	National watershed Development project for rainfed area	Central
11.	Soil conservation works	State
12.	Land Levelling	State
13.	Land Reclamation	State

#### **Horticulture**

1.	National Horticulture Mission (NHM)	Central
2.	National Horticulture Board (NHB)	Central
3.	Micro Irrigation scheme (MIS)	Central & State



### **Animal Husbandry**

1.	Integrated Murrah Preservation Programme	Central
2.	Foot & Mouth disease control Programme	Central
3.	Mini Dairy Scheme	State
4.	Calf rallies Programme	HLDB
5.	Women awareness Camps	HLDB
6.	Top quality buffalo calves purchase programme	HLDB

### **Fisheries**

1.	Construction of New ponds & renovation of ponds	Central
2.	Fisheries inputs	Central
3.	Renovation of water logged area & prawn culture	Central

### **Krishi Vigyana Kendra**

1.	Farmers/ field staff trainings & other extension activities	Central
2.	Vocational trainings for Rural unemployed youth	Central
3.	Conducting FLDS, OFTs & adaptive trails.	Central
4.	Seed multiplication	Central

### **(ii) Special beneficiary oriented schemes**

The following special beneficiary oriented schemes, Wage employment programmes and Area development programmes are being implemented in the district by DRDA, Bhiwani :

1. Swarnjayanti Gram Swarozgar Yojana (SGSY)
2. Jawahar Gram Samridhi Yojana (JGSY)
3. Rural Housing
  - i. New Construction and up gradation of unserviceable houses under IAY
  - ii. Credit-cum-subsidy Scheme for Rural Housing
4. Desert Development Programme (DDP)
5. Employment Assurance Scheme (EAS)
6. Pradhan Mantri Gramodaya Yojana (PMGY)
7. Members of Parliament Local Area Development Scheme (MPLADS)
8. Decentralized Planning (DCP)
9. Sampooran Gramin Rozgar Yojana (SGRY)

## **5.18 Constraint Analysis**

The reasons for the yield and production gaps and the interventions required are planned using participatory/consultative processes involving stakeholders. The natural factors of production including soil and water in Bhiwani district are slowing down in their responses to crops cultivation. The productivity of soils are deteriorating and ground water is lowering down in many areas of the district. Moreover, the quality of ground water is not good being brackish in nature. In recent years, the cropping intensity of the district has increased to 175 % thereby stress on soils increased for the supply of not only major nutrients but micro nutrients too. The poor availability of nutrients in soils is having a direct bearing on crop growth and finally on the quality of produce as grains, fruits, vegetables, fodder etc. It has recently been documented that nutrients deficiency in food and fodder has an adverse affect on the health of human beings and animal. The major reasons of gaps in yield of crops are poor carbon content in the soil, brackish ground water, increasing soil salinity and environmental stresses during the growth period of crops etc. The analysis of sustainability issues and reasons for gaps in the productivity of major fruit and vegetable crops grown the district and subsidiary occupations are presented in Table 21.

**Table – 21 Sustainability issues and gap analysis of productivity of different allied sectors**

Sr.No	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<b>1</b>	<b>Horticulture</b>					
<b>i</b>	<b>Fruit crop</b>	Imbalance use of fertilizers, untimely irrigation, poor management, lack of pollinators	Educate farmers on proper management of fruit crops, balanced and timely application of fertilizers and organic manures and irrigation	Trainings demonstrations, and farmers field school through farmers participatory approach	15% growth in area to reduce fruit drop every year	Increase yield and profitability
<b>ii</b>	<b>Increased incidence of insect-pest and discases</b>	Poor management, on lack of awarness, improper training pruning, contract farming	To aware farmers about preventing measures and control measures of insect-pest and diseases infestation	Training, demonstration, on proper management, training, pruning, insect-pest disease management	20% growth in area every year	Improvement in quality and yield

**2 Vegetables**

New management strategies among small land holding vegetable farmers	Availability of hybrid seeds, cost of hybrid seeds, availability of low water requiring vegetable varieties,	Supply and quality of hybrid seed, marketing enhancement of vegetables, improved germplasm for garlic and onion	Improved germplasm research, farmers' participatory research on technical and market information from different sources to farmers, relaying of production information from farmers to researchers, physical infrastructure for grading, processing and storage, electricity charges on the basis of agriculture for small unorganized food processors and mushroom growers	Special emphasis of vegetable based infrastructure in the district	Will help diversifying agriculture for transforming the system into income generating activities through improved productivity and marketing
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<b>I</b>	<b>Seed treatment</b>	Unawareness, unavailability of small packing of fungicides	Educate farmers regarding benefit of seed treatment	Trainings, demonstrations, seminars, field days to make aware farmers	10% growth in area under seed treatment every year	Increased yield on sustainable basis
<b>ii</b>	<b>Poor nursery management</b>	Unawareness, poor germination	Line sowing, drenching irrigation with showers, proper application of compost in nursery	Mass campaign of nursery management through trainings & demonstrations popularise nursery raising in poly house	10% growth in area under good managed nursery every year	Quality seed lings, Increased income and saving in resources
<b>iii</b>	<b>Lack of adoption in IPM</b>	Lack of awareness, excessive and indiscriminate use of chemical	Variation in dose and low frequency of application based on economic threshold use of less persistant insecticides, crop rotation, synergists, use of insect pheramones and hormones. Protection and use of natural enemies. Re-introduction of susceptible pests	Farmers participatory approach, field schools, supply of pheramones, hormones to farmers	20% growth in area under IPM every year	Improved quality and yield
<b>Iv</b>	<b>Imbalance use of fertilizers</b>	Excessive use of nitrogenous fertilizers, less use of organic manures and micronutrients	Educate farmers in balanced use of fertilizer importance of k, and other micronutrients and organic manure on quality of vegetables	Trainings, demonstrations, farmers field school and awareness campaigns	15% growth in area under balanced use of fertilizers every year	Improvement quality and quantity of the produce

	<b>Mushroom</b>					
<b>I</b>	<b>Poor quality of compost</b>	Long method of compost preparation	Posturised composting on dry weight basis (subsidy)	Demonstration	5% growth in area every year	Increase in productivity
<b>ii</b>	<b>Low quality spawn</b>	No certification and testing facility	Quality spawn with proper certification from any agency	Ensure distribution of good quality spawn of farmers from reliable agency	-	Increase in productivity
<b>iii</b>	<b>IPM</b>	Lack of awareness, poor management	Disinfect of reused materials used in shed, disinfect shed with fumigants, proper spray scheduling, avoid insect entry in the shed	Demonstration, trainings, Mushroom diwas and exposure and exposure visit of the farmers	25% growth in shed with IPM every year	Increase in productivity on sustainable basis
<b>H</b>	<b>Dairy/Animal Husbandry</b>					
<b>i</b>	<b>Poor stock of dairy animals</b>	Un-controlled breeding	Maintenance of herds of pure breed at Govt./ regd. Societies level, supply of quality bulls for natural insemination, Improvement in A.I. facilities/success rates at village level. Association/ group formation of breeders at village level. Ensure supply of kits for detecting the proper time for A.I.	Trainings to Popularize benefit of the A.I. and steps/ precautions to increase success rate of A.I. Provide quality bulls to the panchayat with its responsibility of maintenance	10% village panchayats should be provided quality bulls. Training of VLDA's to increase efficiency of A.I. should be looked into. Individuals (atleast one) from village can be trained in A.I. for employment generations and increasing efficiency & fast multiplications	Improvement in breed and milk yield

					of quality germplasm .	
<b>ii</b>	<b>Imbalanced feeding</b>	Non availability of quality green fodder around the year. Lack of awareness regarding use of proper/right proportion of feed ingredients and mineral mixture supplementation.	Educate farmers regarding benefit of mineral mixture supplementation and balanced & economic feed formulation. Cultivation of leguminous + grassy fodder should be encouraged	Ensure 4-5% of the total area under quality fodder crops. Demonstrate the impact of mineral mixture supplementation on milk yield & infertility management also demonstrate the formulations of economic and balanced ration of dairy animals.	Entire district	Improvement in health of the animals, decrease craving period increase in milk yield.
<b>iii</b>	<b>Repeat breeding, Anestrous problem</b>	Imbalanced feeding, poor managerial practices, parasitic problems and problem of heat detection/silent heat.	Ensure balanced feeding, improved management practices and control of endo and ecto parasites. Kit for detection of heat in animals would be supplied to veterinary hospitals. Deworming of adult animals	Farmers would be advised/ educated to adopt the use of mineral mixture in ration trainings on , extreme summer & winter management of dairy animals, proper heat detection & A.I.	Entire district	Improvement in animals health & productivity.
<b>iv</b>	<b>Calf mortality</b>	Endo & ecto parasites, delayed colostrums (after release of placenta)	Providing deworming facility at the doorstep with latest quality dewormer	Mass awareness adoption campaign for deworming for control of endo parasites & timely/	Whole of the district the calf mortality be reduced to 5% from about 25% within 5 years	Increase in animals resource

				early colostrums feeding.		
	<b>Fishery</b>					
	<b>Forestry</b>					
	<b>Shishem &amp; Kikar mortality</b>	Fungal infection	Survey and identification			

**Table 22. Activity Output Matrix (Log Frame Summary)**

Sr . No.	Thrust Areas (where gaps exist)	Weaknesses	Solutions	Concerned Agencies	Approach
1	Nursery raising in poly houses/poly tunnels	Insufficient number of nurseries and less area under mother plants to meet the demand of grafts/seedlings of fruit and vegetables in the district.	<p>Naturally ventilated poly house/poly tunnel nurseries : DHO will motivate farmers for raising nurseries in naturally ventilated poly houses/poly tunnels of crops/vegetables. DHO also will regulate and monitor 50% subsidies on poly houses/poly tunnels.</p> <p>DHO will provide guidance to farmers for seeking loans from credit institutions for poly houses/poly tunnel nurseries</p> <p>KVK will organize farmers trainings for providing technical guidance and maintenance of nurseries in poly houses/poly tunnels.</p>	<p>DHO</p> <p>DHO</p> <p>DHO/KVK</p>	Table -23 & 24
2	Onion (low water requiring varieties)	The water requirement of existing onion varieties is high.	DHO/KVK will demonstrate low water requiring varieties of onion with drip irrigation to	DHO	Table -24



		Poor availability of irrigation water for onion.	<p>replace existing varieties with low water requiring varieties of onion.</p> <p>The DHO will work to cover about 750 hectare area under low water requiring onion with drip irrigation system during the plan period. The subsidies of 50% on drip system in onion will be monitored by DHO.</p> <p>(DHO will also make necessary linkages with public/ private seed agencies for arranging seed of onion with low water requiring varieties).</p>	DHO	
3	Fruit plants (Citrus, Ber, Aonla & Bel under drip irrigation)	Low production and less area under fruits plants due to poor availability of irrigation water and non adoption of micro irrigation system.	<p>DHO/KVK will demonstrate and impart trainings for the cultivation of fruit plants with drip irrigation for sustainable production and higher income.</p> <p>The DHO will make efforts</p>	DHO/KVK  DHO	Table 24,25,26 & 28

4	Vegetables (under drip irrigation system)	The production and area under vegetables is very less due to poor availability of irrigation water and non adoption of micro irrigation system.	<p>for covering about 500 hectare area under Citrus, Ber, Aonla &amp; Bel fruits under drip irrigation system during the plan period. The subsidies of 50% on drip system in fruits will be regulated/monitored by DHO.</p> <p>(DHO will make necessary linkages with credit agencies and public/private agencies for arranging saplings of high yielding citrus, ber, aonla and bel plants).</p> <p>DHO/KVK will demonstrate and impart trainings for the cultivation of vegetables with drip irrigation for sustainable production and higher income.</p> <p>The DHO will make efforts to cover about 1000 hectare area under vegetables with</p>	<p>DHO/KVK</p> <p>DHO</p>	Table -24
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5 (a)	Vegetable hybrids (Kharif season)	The production and area under hybrid vegetables in kharif season is very low due to non availability of suitable hybrids.	<p>drip irrigation system during the plan period. The subsidies of 50% on drip system in vegetables will be regulated/monitored by DHO.</p> <p>(DHO will also make necessary linkages with credit agencies and public/private seed agencies for arranging high yielding varieties/ hybrids of important vegetables).</p> <p>Participatory selection of kharif season vegetable hybrids at farmers' field.</p> <p>Surveying and monitoring of yield performance of hybrids in important kharif vegetables namely bhindi and bottlegourd.</p> <p>Presenting data of best performed hybrids.</p>	<p>DHO</p> <p>DHO</p> <p>KVK</p>	Table 25 ,26, 28 & 29
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5 (b)	Vegetable hybrids (Rabi season)	The production and area under hybrid vegetables in rabi season is very low due to non availability of suitable hybrids	Deleting hybrids with low yields in any current season.	KVK	
			Mandatory testing of new hybrids through KVK's	KVK	
			Participatory selection of rabi season vegetable hybrids at farmers' field.	DHO	
			Surveying the yield performance of hybrids in important rabi season vegetables namely tomato, brinjal and chilli.	DHO	
			Presenting data of best performed hybrids.	KVK	
			Deleting hybrids with low yields in any current season.	KVK	
			Mandatory testing of new hybrids through KVK's	KVK	

6	Agro & Social Forestry	Deficiency in natural forest area i.e. only 0.74% of the total geographical area of Bhiwani district.	<p>Forest Department Bhiwani district will make survey to put community, panchayat and other wastelands under tree plantations in order to increase the forest area about 5000 ha during the plan period.</p> <p>Forest Department of the district will ensure to supply seedlings of khejri, Ailanthus, Neem, Siris, Bakain, Shisham, Jatropha etc to farmers on subsidized rate.</p>	<p>District Forest Officer</p> <p>District Forest Officer</p>	Table 26& 58
7	Mushroom farming	Mushroom farming is not adopted as a subsidiary activity due to poor knowledge .of farmers about management of spawn laboratory, Culture media preparation,	DDA/KVK will provide trainings on layout of a spawn laboratory, equipments required for spawn laboratory, culture preparation and its' storage, preparation of mother and planting spawn, qualities of	DDA/KVK	Table 23, 24 , 27, 28 & 29

		spawn planting, quality control etc.	a good spawn etc.		
8	Vermicomposting	Demand for vermicompost is increasing but availability of vermicompost is very poor.	DDA will explore the possibilities of credit facilities for mushroom units, marketing opportunities through private agencies and exposure visits of the farmers.  DDA/KVK will provide trainings on the efficient methods of vermicompost preparation.  DDA will explore the possibilities of credit facilities for commercial mushroom units, marketing opportunities through private agencies and exposure visits of the farmers.	DDA  DDA/KVK  DDA	Table-54
9	Beekeeping	Farmers are having poor knowledge about the role of honey bees in obtaining higher	DDA/KVK will provide trainings for starting successful units of honey bees.	DDA/KVK	Table -55

		yields of mustard and other crops.		DDA	
10	Bio-gas/gobar gas plants	Poor knowledge of farmers for the management of bio-gas plants.	<p>DDA will explore the possibilities of credit facilities for starting honey units, marketing opportunities through private agencies and exposure visits of the farmers.</p> <p>DDA/KVK will provide trainings for starting successful units of bio-gas/gobar gas plants. DDA will make efforts to get established about 1500 units of bio-gas/gobar gas units with 50% subsidy. The subsidies will be regulated/monitored by DDA.</p> <p>DDA will arrange exposure visits of farmers to see those bio-gas plants which are running successfully.</p>	<p>DDA/KVK</p> <p>DDA</p> <p>DDA</p>	Table 24

11	Sheep & goats	Low production due to poor management, slow weight gain, non availability of natural service, lack of ration/feed, less area under pastures, high incident of diseases and poor preventive vaccination programmes.	DDAH and KVK will organize trainings for better management and higher production.  DDAH will make linkages with private agencies for starting facilities of marketing and availability of feed through co-operatives.	DDAH/KVK  DDAH	Table 24
12	Piggeries	Low production due to poor management, slow weight gain, lack of good quality ration/feed, less area under pastures and high incident of diseases.	DDAH and KVK will organize trainings for better management and higher production.	DDAH/KVK	Table 24
13	Poultry	Low production due to poor knowledge about housing and rearing, high incident of diseases, poor quality of drinking	DDAH and KVK will organize trainings for better management and higher production.	DDAH/KVK	Table 24



14	Fisheries	<p>water, non availability of quality feed and healthy chicks and unorganized marketing.</p> <p>Less production of fish due to poor technical knowledge of fish farming, poor management of fish farms, poor quality of ground water and unorganized marketing.</p>	<p>DFO/KVK will organize trainings/demonstrations for fisheries development during the plan period</p> <p>DFO will work to develop advance stock of 10 lacs fingerlings 50 mm size during the plan period</p> <p>DFO will get one hatchery established during the plan period for rearing fingerlings. DFO will also contact concerned departments for arranging tube well and canal water for the hatchery.</p>	<p>DFO/KVK</p> <p>DFO</p> <p>DFO</p>	Table-24
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15	Agro-based small scale industries	Industrially backward and no big industry in the district. Majority of small scale industries are sick.	GMDIC will work to establish about 750 SSI units under self employment scheme with 50% subsidy during the plan period and also impart trainings to beneficiaries.	GMDIC	Table-24
16	Group Organizations of farmers	Lack of interest and poor knowledge of farmers for the formation of farmers clubs, krishi vigyan mandals and community groups. The objectives of these groups are also not clear to the farmers.	CEO, DRDA will motivate farmers through trainings for the formation of farmers clubs, krishi vigyan mandals and community groups.	CEODRDA	Table-29

**Recommended intervention in the district with detailed action plan with cost**

**Table 23 Training Proposed for Capacity Building of Allied sectors Staff on different aspect covered under Plan**

Name of the Department	Year wise no. of staff to be trained (Phy- Nos. , Fin. – Rs in lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
<b>Horticulture</b>	50	0.30	50	0.30	50	0.30	50	0.30	50	0.30	<b>250</b>	<b>1.5</b>
<b>Animal husbandry</b>	500	3.0	500	3.0	500	3.0	500	3.0	500	3.0	<b>5000</b>	<b>15.0</b>
<b>Fishery</b>	50	0.30	50	0.30	50	0.30	50	0.30	50	0.30	<b>250</b>	<b>1.5</b>
<b>Credit institutions</b>	100	0.60	100	0.60	100	0.60	100	0.60	100	0.60	<b>500</b>	<b>3.0</b>
<b>Total</b>	<b>700</b>	<b>4.2</b>	<b>700</b>	<b>4.2</b>	<b>700</b>	<b>4.2</b>	<b>700</b>	<b>4.2</b>	<b>700</b>	<b>4.2</b>	<b>3500</b>	<b>21.0</b>

**Cost norms – Rs 600/ trainee/day**

**Table 24 : Planning for Farmers Training for Capacity Building and Skill Up gradation Related to Allied fields**

Sr. No.	Technology /Aspect	No of farmers to be trained and fund requirement (Phy- No. of trainees, Fin- Rs.in lacs)										Total	
		2007-08		2008-09		2009-10		2010-11		2011-12		Phy	Fin
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin		
1	Seed Production	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
2	Post Harvest management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
3	Green House	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
4	Micro Irrigation	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
5	IPM	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
6	Rejuvenation of old orchard	40	0.16	40	0.16	40	0.16	40	0.16	40	0.16	200	0.8
7	Flower cultivation	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
8	Fish Farming	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
9	Agro Forestry	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
10	Credit and marketing management	150	0.60	150	0.60	150	0.60	150	0.60	150	0.6	750	3.0
11	Renewable energy sources	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
12	INM	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
13	RCTs	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
14	Weed management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
15	Mushroom	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
16	Bee Keeping	350	1.40	350	1.40	350	1.40	350	1.40	350	1.40	1750	7.00
17	Modern dairy management aspects	1000	4.0	1000	4.0	1000	4.0	1000	4.0	1000	4.0	5000	20.0
18	Poultry management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
19	Sheep, goat and pig rearing	400	1.6	400	1.6	400	1.6	400	1.6	400	1.6	2000	8.0
	Exposure visit	500	25.0	500	25.0	500	25.0	500	25.0	500	25.0	2500	125.0
	<b>Total</b>	<b>4290</b>	<b>40.16</b>	<b>4290</b>	<b>40.16</b>	<b>4290</b>	<b>40.16</b>	<b>4290</b>	<b>40.16</b>	<b>4290</b>	<b>40.16</b>	<b>21450</b>	<b>200.8</b>

Cost norms – Rs. 400/trainee/day

**Table 25 IPM Demonstrations in Horticultural crops Next Five Years**

Crop	Area under each demon.(ha)	IPM Demonstrations Projection											
		(Phy Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy	Fin.	Phy	Fin	Phy.	Fin.		
Vegetable crops	<b>0.4</b>	125	0.875	150	1.05	175	1.225	200	1.4	225	1.575	875	6.125
Horticulture	<b>0.4</b>	50	0.75	50	0.75	50	0.75	50	0.75	50	0.75	250	3.75
<b>Total</b>		<b>175</b>	<b>1.625</b>	<b>200</b>	<b>1.8</b>	<b>225</b>	<b>1.975</b>	<b>250</b>	<b>2.15</b>	<b>275</b>	<b>2.325</b>	<b>1125</b>	<b>9.875</b>

**Table 26 : INM Demonstrations in vegetable crops in Next Five Years**

Crop	Area under each demon.(ha)	INM Demonstrations Projection (Phy - Area covered in ha, Fin – Rs. In lacs)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy	Fin.	Phy	Fin.	Phy.	Fin.
Carrot	<b>0.4</b>	20	1.0	25	1.25	30	1.5	35	1.75	40	2.0	<b>120</b>	<b>6.0</b>
Tomato	<b>0.4</b>	30	1.50	40	2.0	45	2.25	50	2.5	60	3.0	<b>225</b>	<b>11.25</b>
Cucurbits	<b>0.4</b>	30	1.50	40	2.0	45	2.25	50	2.5	60	3.0	<b>225</b>	<b>11.25</b>
Onion	<b>0.4</b>	30	1.5	35	1.75	40	2.0	45	2.25	50	2.5	<b>200</b>	<b>10.0</b>
Garlic	<b>0.4</b>	30	1.5	35	1.75	40	2.0	45	2.25	50	2.5	<b>200</b>	<b>10.0</b>
Total	<b>0.4</b>	<b>140</b>	<b>7.0</b>	<b>175</b>	<b>8.75</b>	<b>200</b>	<b>10</b>	<b>225</b>	<b>11.25</b>	<b>260</b>	<b>13</b>	<b>970</b>	<b>48.5</b>

**Table 27 Demonstrations on important aspects identified in the Plan in allied sectors/ enterprises**

Allied Sectors/ enterprise	Demonstrations Projection (Phy – No. of demons., Fin – Rs. In lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
<b>Dairy</b>	500	1.0	500	1.0	500	1.0	500	1.0	500	1.0	<b>2500</b>	<b>5.0</b>
<b>Poultry</b> (including backyard)	500	1.0	500	1.0	500	1.0	500	1.0	500	1.0	<b>2500</b>	<b>5.0</b>
<b>Sheep, goat and Piggery</b>	250	0.5	250	0.5	250	0.5	250	0.5	250	0.5	<b>1250</b>	<b>2.5</b>
<b>Mushroom</b>	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	<b>50</b>	<b>2.5</b>
<b>Fishery</b>	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	<b>50</b>	<b>2.5</b>
<b>Agro Forestry</b>	20	1.0	20	1.0	20	1.0	20	1.0	20	1.0	<b>100</b>	<b>5.0</b>
<b>Vermicompost</b>	100	2.0	100	2.0	100	2.0	100	2.0	100	2.0	<b>500</b>	<b>10.0</b>
<b>Total</b>	<b>1390</b>	<b>6.5</b>	<b>1390</b>	<b>6.5</b>	<b>1390</b>	<b>6.5</b>	<b>1390</b>	<b>6.5</b>	<b>1390</b>	<b>6.5</b>	<b>6950</b>	<b>32.5</b>

**Table 28 Farmer Field Schools covering identified critical technologies in Next Five Years**

Fields	Farmer Field Schools Projection (Phy – No. of field school, Fin – Rs. In lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Dairy	50	10.0	50	10.0	50	10.0	50	10.0	50	10.0	<b>250</b>	<b>50.0</b>
Poultry (including back yard)	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Goatry and Piggery	30	6.0	30	6.0	30	6.0	30	6.0	30	6.0	<b>150</b>	<b>30.0</b>
Fish Farming	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Bee Keeping	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Agro Forestry	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Mushroom	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Vegetable crops	50	10.0	50	10.0	50	10.0	50	10.0	50	10.0	<b>250</b>	<b>50.0</b>
<b>Total</b>	<b>160</b>	<b>32</b>	<b>160</b>	<b>32</b>	<b>160</b>	<b>32</b>	<b>160</b>	<b>32</b>	<b>160</b>	<b>32</b>	<b>800</b>	<b>160</b>

**Cost norms- Rs. 0.20 lac/ FFS**



**Table 29 Group formation /Commodity interest groups formation for specific activities**

Interest Group(s)	Group Formation Projection Plan (Phy – No. of groups, Fin – Rs. In lacs)											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Dairy	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	<b>100</b>	<b>20.0</b>
Poultry (including back yard)	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Goatry and Piggery	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	<b>50</b>	<b>10.0</b>
Fish Farming	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	<b>25</b>	<b>5.0</b>
Bee Keeping	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	<b>10</b>	<b>2.0</b>
Agro Forestry	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	<b>10</b>	<b>2.0</b>
Mushroom	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	<b>10</b>	<b>2.0</b>
Vegetable crops	50	10.0	50	10.0	50	10.0	50	10.0	50	10.0	<b>250</b>	<b>50.0</b>
<b>Total</b>	<b>96</b>	<b>19.2</b>	<b>96</b>	<b>19.2</b>	<b>96</b>	<b>19.2</b>	<b>96</b>	<b>19.2</b>	<b>96</b>	<b>19.2</b>	<b>480</b>	<b>96</b>

Cost norms- Rs.0.20 lacs/group (for capacity building, input assistance, marketing and for group specific activities )

### Projected outcome and growth rate during XI Five Year Plan (hort./veg. crops)

Table 30 Area, Production and Productivity Trend of Main Crops in the District for next five year (Area – ha, Production – 000 q, productivity – q/ha)

S. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08 (Projected)			2008-09 (Projected)			2009-10 (Projected)			2010-11 (Projected)			2011-12 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Guava	-	-	-	-	-	-	100	0.72	72	120	.90	75	140	1.1	78	160	1.28	80
2	Ber	-	-	-	-	-	-	50	3.51	117	60	4.27	122	80	4.75	125	100	5.08	127
3	Citrus		-	-	100	-	-	200	-	-	220	-	-	240	-	-	260	-	-
4	Aonla	-	-	-	50	--	-	50	-	-	60	--	-	80	-	-	100	-	-
5	Tomato	-	-	-	200	3.0	150	250	4.5	160	250	4.12	165	250	4.20	168	250	4.25	170
6	Garlic	-	-	-	100	0.25	25	110	0.28	26	120	0.32	27	130	0.36	28	140	0.42	30
7	Carrot	-	-	-	200	4.4	220	225	5.17	230	250	5.95	2.38	270	6.56	2.43	290	7.10	245
8	Onion	-	-	-	100	1.2	120	110	1.37	125	120	1.56	130	130	1.75	135	140	1.96	140
		23770	3099		24265	3212		24655	3288		25045	3432		25410	3554		25745	366	

## Chapter VI

### District Plan

#### 6.1 Introduction

The proposed district plan includes agriculture, horticulture, forestry, animal husbandry, fisheries and innovative as well as miscellaneous schemes as the major activities to be undertaken in the district Bhiwani. The existing status of these sectors has been issued in detail in the preceding chapters with the proposed outlays for XI plan.

#### 6.2 Growth drivers

The targets will be achieved using different growth drivers in agriculture and allied sectors as follows:

##### 6.2.1 Agriculture

- a) Mechanization for increasing water use efficiency.
- b) Increasing area under crop/improved varieties which can be water stress & salt tolerant.
- c) Safe use of brackish water for irrigation.
- d) Soil health improvement.
- e) Resource conservation technologies for sustaining and improving the productivity levels.
- f) Seed treatment and enhancing seed replacement rate.
- g) IPM, INM and IWM.
- h) Demonstration and capacity building of field functionary and farmers
- i) Human resource development.

##### 6.2.2. Horticulture

- a) Increasing area under fruits and vegetable crops.
- b) Providing improved planting material of fruit crops.
- c) IPM and INM
- f) Encouraging income and employment generating vocations through agro based vocations.

- g) Demonstrations and trainings including farmers and field official

### **6.2.3 Forestry:**

- a) Increasing area under forests through plantation in community lands.
- b) Increasing area under agro-forestry particularly of Khezri.
- c) Demonstrations and trainings including farmers and field officials

### **6.2.4. Animal Husbandry:**

- a) Mineral mixture feeding
- b) Deworming
- c) Breed improvement through community bulls and A.I
- d) Balanced feeding
- e) Improvement of village ponds
- f) Demonstration and capacity building of field functionary and farmers

### **6.2.5 Fisheries:**

- a) Improvement of village ponds.
- b) Making availability of good quality fish seed
- d) Balanced feeding in ponds
- e) Capacity building of farmers and field functionary.

## **6.3 Innovative Schemes/ Projects**

### **A) Projects for Agriculture Sector Development**

#### **1. Strengthening of training infrastructure facilities at Krishi Vigyan Kendra (district level) and Farm Information and Advisory Centers (FIACs -at Block Level) .**

Trainings are one of the most important extension activities conducted by extension and development institutions/ departments to educate farmers on different aspects of agricultural and allied activities. The changing agri economic scenario , fast technology generation and its applications in complex world of today's agriculture necessitated constant trainings for capacity building and skill up gradation of farmers as well as technical staff. The KVKs and FIACs are established training institutions at district and block level, respectively, to cater to the training needs of different clientele. Infrastructural facilities are needed to be created at both levels for conducting training effectively to raise farm productivity.

<b>Narrative Summary</b>	<b>Objectively verifiable indicators</b>
<p><b>Project goal-</b> Development of human resource for raising farm productivity</p> <p><b>Purpose-</b> To strengthen facilities at district and block level for conducting effective training programmes for farmers and field staff.</p> <p><b>Output-</b> Well informed, skilled and upgraded farmers and field staff for rationale decision making in agriculture and allied fields.</p>	<p>Upgradation in knowledge and skills of the farmer and staff.</p> <p>Increase in production, productivity and profitability of crops and allied enterprises.</p>

**Table-31 Cost For Strengthening Infrastructure at KVK (at district level)**

<b>Sr. No.</b>	<b>Infrastructure</b>	<b>No.</b>	<b>Cost (in lacs)</b>
1	Well Equipped Training Hall	1	50.0
2	Information Technology Lab	1	25.0
3	Automatic Weather Station	1	8.0
	<b>Total</b>		<b>83.0</b>

**Table-32 Cost For Strengthening Infrastructure at FIAC (block level)\***

<b>Sr. No.</b>	<b>Infrastructure</b>	<b>No.</b>	<b>Cost (in lacs)/ unit</b>	<b>Total cost (Rs. lacs)</b>
1	Well Equipped Training Hall	10	30.0	300.0
2	E- connected computer lab	10	10.0	100.0
	<b>Total</b>		<b>40.0</b>	<b>400.0</b>

\* There are ten blocks in the district and each block has one FIAC.

**Table-33 Cost for strengthening of labs at district level**

<b>Sr. No.</b>	<b>Laboratory</b>	<b>No.</b>	<b>Cost (in lacs)</b>
1	Soil testing lab	2	40.0
2	Plant clinic	1	20.0
	<b>Total</b>		<b>60.0</b>

**Table-34 Strengthening / opening veterinary hospitals/ facilities**

<b>Sr. No.</b>	<b>Vety. Hospital/ facilities</b>	<b>No.</b>	<b>Cost (in lacs)</b>
1	Veterinary Hospitals	50	500.0
2	Crystoscopic kits	50	50.0
3	A.I.Kits	50	50.0
	<b>Total</b>		<b>600.0</b>

**Total cost of the project= 83.0+400.0+40.0+600=1123.0**

## **2. Project for Rain water Harvesting**

Water harvesting refers to collection and storage of rain water and also other activities aimed at harvesting surface and ground water, prevention of losses through evaporation and seepage and all other hydrological studies and engineering interventions, aimed at conservation and efficient utilization of the limited water endowment of a physiologic unit such as a watershed. Rain is the primary source of water for us. Rivers, lakes, and groundwater all are secondary sources of water. In present times, we depend entirely on such secondary sources of water. In the process, it is forgotten that rain is the ultimate source that feeds all these secondary sources and remain ignorant of its value. Water harvesting means to understand the value of rain and to make optimum use of rain water at the places where it falls.

The annual rain fall of the district is nearly 350 mm. However, this rainfall occurs during short spell of high intensity. Because of such intensities and short duration of heavy rain, most of the rain falling on surface tends to flow away rapidly, leaving very little for the recharge of ground water. This highlights the need to implement measure to ensure that the rain falling over a region is tapped as fully as possible through water harvesting, either by recharging it into the groundwater aquifers or storing it for direct use.

It becomes imperative for the farmers not only to adopt techniques for efficient water use but also pay attention towards rain water harvesting and recharging. Water recharging has to be taken up on community level. Out of several methods of water harvesting open

well method is more appropriate under the circumstances. This proposed recharge scheme will not only check decline in water level but will result into rise of water level upto 0.50 meter. It will also bring additional land under irrigation.

**Project Cost:**

- Area identified for artificial recharge :1390 sq km
- Sub surface storage potential :2445 MCM
- Surface water requirement :3252 MCM
- Proportionate non committed wate resource Available  
(as surplus & kept for future planning) :62.46MCM
- Surface water considered for artificial recharge toground water :62.46MCM
- Proposed Recharging structures to be made :1450
- Cost of one structure :Rs. 100000
- Total cost :Rs.1450.0 lacs

**Table-35 Year wise budget required to make recharging structures**

<b>Component</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>TOTAL</b>
<b>Structures to be made</b>	<b>250</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>1450</b>
<b>Budget required (in lakhs)</b>	<b>250</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>1450.0</b>

**3. Project on Reclamation of Alkali soils & waters**

The soils which have Exchangeable sodium percentage (ESP) more than 15 and Electrical conductivity less than 4.0 m m hos/cm at 26° c are called alkali soils. These types of soils generally occur in semi arid and arid regions in small irregular areas. The exchangeable sodium present in alkali soils may have marked effect on physical and chemical properties. As the ESP increases, the soils tend to become more dispersed. The PH reading may increase, sometimes becoming as high as 10. This alkalinity deteriorates the soil fertility. In such soil seed germination is severely affected, plants remain stunted and ultimately land to low yield thus causes heavy loss of national wealth. In such soil due to dispersion of the day

water does not percolate down easily. To reclaim such soils first we should take samples and get them analyzed for their gypsum requirement. Application of gypsum based on gypsum requirement is the only way for their reclamation.

### Logical framework matrix- Reclamation of Alkali Soils in District Bhiwani

Narrative Summary	Objectively verifiable indicators
<p><b>Project goal-</b> To reclaim Alkali soils through application of gypsum.</p> <p><b>Purpose-</b> To improve the fertility and productivity of the soil. Leaching the extra salts of sodium. Improve the physico-chemical properties of the soils.</p> <p><b>Output-</b> Increase in the production of the crops and thereby increase in income of the farmers. The soil will be made suitable for crop production. The ESP will be reduced.</p>	<p>To reclaim such soils first we should take samples and get them analyzed for their gypsum requirement. Application of gypsum based on gypsum requirement is the only way for their reclamation. After that soils are tested for pH, EC, SAR or ESP to see whether soils are reclaimed or not.</p> <p>At present the total alkali soil in district Bhiwani is about 10000 ha.</p>

At present the total alkali soil in district Bhiwani is about 10000 ha

### Cost of Project to reclaim 10000 ha of Alkaline soils

**Table-36 Year wise budget required to reclaim Alkaline soils**

Component	2007-08	2008-09	2009-10	2010-11	2011-12	TOTAL
<b>Area to be reclaimed (ha)</b>	<b>2000</b>	<b>2000</b>	<b>2000</b>	<b>2000</b>	<b>2000</b>	<b>10000</b>
<b>Gypsum requirement (ton)</b>	<b>12500</b>	<b>12500</b>	<b>12500</b>	<b>12500</b>	<b>12500</b>	<b>62500</b>
<b>Total cost of the project(in lacs) (including other expenses)</b>	<b>55</b>	<b>55</b>	<b>55</b>	<b>55</b>	<b>55</b>	<b>275.0</b>

### 4. Sulphur Application in Mustard Through Gypsum

Sulphur plays an indispensable role in mustard for protein formation and important for a high protein content in rapeseeds. Under conditions of sulphur shortage plants produce



lesser amounts of S-containing amino acids and thus the composition of protein is also influenced. Thus, under conditions of sulphur deficiency, protein synthesis is inhibited. Low sulphur supply impairs the quality of rapeseeds because the oil content decreases. Since the soils of Bhiwani district are deficient in sulphur, therefore, it is not possible to obtain high yields of mustard without sulphur application. The easily available source for the supply of sulphur in mustard is gypsum. Therefore, it is proposed to make about 20 thousand tonnes gypsum available for covering about 40 thousand hectare area during the plan period.

**Table-37 Projections for the application of sulphur through gypsum in mustard during XIth plan**

Year	Area (000ha)	Gypsum requirement (Tonnes)	Cost of gypsum (Lacs)
2007-08	20.0	8000	144.0
2008-09	20.0	8000	144.0
2009-10	20.0	8000	144.0
2010-11	20.0	8000	144.0
2011-12	20.0	8000	144.0
Total	100.0	40000	720.0

### **5. Popularization of castor + guar, castor + moong & castor + moth intercropping system**

In order to utilize available land and water resources efficiently and for obtaining desired growth rate, it is required to introduce and popularise intercropping of guar in castor in the district. Besides this, it will produce higher yields per unit area, offer great stability in production under adverse weather conditions and with disease and insect infestation. This will also meet the domestic needs of the farmers and provide employment opportunities to the farmers. Therefore, it is proposed to introduce and popularise the castor + guar intercropping system in the district during the plan period.

**Table-38 Proposed demonstrations and extension activities for the popularization of castor + guar intercropping during XIth plan**

Year	Castor + Guar/Moong/moth			Total Cost (Lacs)	Projected Gross Income (Lacs)
	Area to be covered (ha)	Demonstrations cost (Lacs)	Extension activities cost (Lacs)		
2007-08	50	3.5	1.2	4.7	5.17
2008-09	50	3.5	1.2	4.7	5.17
2009-10	60	4.2	1.4	5.6	6.16
2010-11	70	4.9	1.6	6.5	7.15
2011-12	80	5.6	1.8	7.4	8.14
Total	310	21.7	7.2	28.9	31.79

**6. Popularization of napier grass as green fodder crop in the district**

Napier grass or elephant grass due to its vigorous vegetative growth under light soils with high pH conditions can be exploited with micro irrigation system for fodder production in Bhiwani district. It's cultivation will increase the availability of green fodder round the year for animal. Therefore, it is proposed to cover about 1050 ha area with drip irrigation system during the plan period.

**Table-39 Proposal for cultivation of Napier grass for fodder under drip irrigation during XI plan.**

Year	Area (ha)	Drip Installation cost/ha (Lac)	Total Cost (Lac)	No. of trainings	Cost of trainings (Lac)	Cost of root cuttings (Lac)	Total Cost (Lac)
2007-08	150	0.80	120.00	3	0.66	6	126.66
2008-09	200	0.80	160.00	4	0.88	8	168.88
2009-10	200	0.80	160.00	4	0.88	8	168.88
2010-11	250	0.80	200.00	5	1.10	10	211.10
2011-12	250	0.80	200.00	5	1.10	10	211.10
Grand Total							886.62

\*No. of farmers in each training = 5

Cost of 28000/ha root cuttings for planting = 400/ha

## 7. To improve Soil health through Green Manuring in District Bhiwani

Narrative Summary	Objectively verifiable indicators
<p><b>Project goal-</b> To improve soil health through green manuring.</p> <p><b>Purpose-</b> To improve the fertility and productivity of the soil. Improve the physic chemical properties of the soils. To increase in the organic matter of the soils.</p> <p><b>Output-</b> Increase in the production of the crops and thereby increase in income of the farmers. Improvement in the soil organic matter.</p>	<p>The effect of green manuring on soil health and its impact on succeeding crop will be studied in 10 % of the fields covered under the project by involving PRIs, Deptt. Of Agri. and KVK every year.</p>

**Table-40 Cost of the Project**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area under paddy –wheat & bajra - raya cropping system(ha)	100000	100000	100000	100000	100000	
Area to be covered under green manuring(ha)	20000	20000	20000	20000	20000	100000
Dhaincha seed* to be required@ 30 kg/ha (q)	6000	6000	6000	6000	6000	30000
Cost of the seed @ Rs. 1500/q (in lacs.)	90	90	90	90	90	450.0
Subsidy @ 75%	67.5	67.5	67.5	67.5	67.5	337.5
Monitoring and evaluation	1.0	1.0	1.0	1.0	1.0	5.0
<b>Total cost</b>						<b>342.5</b>

\* The extension activities will be covered under INM training programme.

**Total cost of the project on green manuring =342.5 lacs**

## 8. Project:- Increasing agricultural Productivity of Land and Water Resources through Laser Levellers (RCTs.)

### Objective:-

- ▶ To increase productivity of crops by increasing efficiency of land and water resources.
- ▶ To Enhance cultivated area
- ▶ To Reduce production costs by enhancing cultivation efficiency.
- ▶ Alleviate poverty in rural areas through better farm returns and employment generation.

Background:- It is an established fact that 20 to 25% water is lost during irrigation due to uneven fields and poor farm designing. This leads to excessive application to low-lying areas and under irrigation of higher spots. Over irrigation leaches soluble nutrients from the crop root zone, makes the soil less productive and degrades ground water quality. On the other hand, under irrigation of elevated parts of the fields results in accumulation of salts in such patches besides causing water stress and injurious effects of applied fertilizers. The fields being not properly levelled, cause wastage of land, result in low irrigation efficiencies and ultimately much lesser yields are obtained than the potential. In the present scenario of decreasing irrigation water availability, it has become imperative to develop strategies for efficient utilization of this scarce and valuable resource.

Solution:- Solution to all above mentioned impediments to higher yield is modern land levelling technology i.e. the precision Land Leveling Technology (PLL).

What is PLL:- PLL is a process of grading and smoothing the land to a precise and inform plane surface at grade or no grad (zero slope) with variation of less than one inch i.e. + 20 mm (2 cm)

### **Benefits of PLL over traditional method**

Traditional method of PLL involves earth movement with bucket type soil scrapers and tractor mounted rear blades which in very laborious and expensive to finish the land surface to exact grade. Use of laser technology in precision lane levelling is a very useful development. It minimize the cost of operation, ensures better degree of accuracy in much lesser time, save irrigation water, ascertain uniform seed germination, increase fertilizer use efficiency and resultantly enhances crop yields.

- ▶ Increase in crop yield as much as 25 per cent.
- ▶ Reduction in time of Irrigation and amount of water by upto 50 per cent
- ▶ Enhancement of the crop area by about 2 per cent
- ▶ Control of water- logging and salinity

- ▶ Facilitation in efficient use of farm machinery
- ▶ More productive utilization of seeds, fertilizers and other non-water inputs.

**Table-41 Project cost and Area Levelling (Rs. In Lacs)**

Year	Units (No. of L. Levellers)	Total Cost Rs. 3.6 Lac/unit	Area Levelling (in ha.)	Project cost @75% subsidy 2.7 Lac/unit from RKVY	Total Cost of Project
2007-08	20	72-00	2400	54-00	<b>54-0</b>
2008-09	20	72-00	2400	54-00	<b>54-0</b>
2009-10	20	72-00	2400	54-00	<b>54-0</b>
2010-11	20	72-00	2400	54-00	<b>54-0</b>
2011-12	20	72-00	2400	54-00	<b>54-0</b>
Total	100	360-00	12000	270-00	<b>270.0 lacs</b>

Total cost of Project Subsidy component @ 75% of cost

Farmers are to be given 75% subsidy from RKVY)

Over a period of five years about 12000 ha. Area can be levelled under the project which will result into.

- ▶ Saving of irrigation water about 20%.
- ▶ Increase in crop yield by about 20 per cent
- ▶ Increased efficiency of seed, fertilizer and other inputs thus reducing cost of cultivation and increasing factor productivity

## **9. Seed Production for achieving desired Seed Replacement Ratio**

### **i) Wheat**

Current seed replacement ratio	=23 %
Desired seed replacement ratio	=33to40%
Certified seed availability	=29210 qtls.
Additional certified seed required	=15240 qtls

(as per desired seed replacement rate)

Project to produce desired certified seed

No. of villages selected from each block for seed production =5  
 Total villages selected from the district =50  
 Area to be brought under wheat seed programme from each selected village =10 ha  
 Total area covered under each block =10x5=50 ha  
 Total area covered in the district =50x10=500 ha

**Cost:**

Foundation seed to seed to be supplied to the farmers for seed production =500 qtls  
 Cost of each demonstration = Rs. 5000

**Total cost =5000x500x5=12500000  
 (125 lacs)**

**ii) Carrot/onion**

No. of villages selected in each block for seed production =2  
 Total villages selected from the district (3 blocks) =6  
 Area to be brought under veg. seed programme from each selected village under each crop =2 ha  
 Total area covered under each block =12 ha  
 Total area covered in the district =12x3=36ha  
 Total cost (Rs. 7500/ha) =36x7500=270000  
 (2.70 lacs)

**Table-42 Carrot**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area (ha)	12	12	12	12	12	60
Financial Requirement* @ Rs.7500/ ha (lacs)	0.90	0.90	0.90	0.90	0.90	4.50
Estimated Seed Produced @2.5 q/ ha (q)	30.0	30.0	30.0	30.0	30.0	150.0
<b>Total Cost of the Project(lacs)</b>						<b>4.50</b>

\* includes cost of seed, fertilizers, IPM & extension activities

**Table-43Onion**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area (ha)	12	12	12	12	12	60
Financial Requirement* @ Rs.7500/ ha (lacs)	0.90	0.90	0.90	0.90	0.90	4.50
Estimated Seed Produced @1.5 q/ ha (q)	18.0	18.0	18.0	18.0	18.0	90.0
<b>Total Cost of the Project (lacs)</b>						<b>4.50</b>

\* includes cost of seed, fertilizers, IPM & extension activities

## PROJECTS FOR ALLIED SECTOR DEVELOPMENT

### 10. Project on Farm and Animal Disposal Pits

For any agricultural production system the soil health is the key factor. Due to the over exploitation of land in Bhiwani particularly in paddy- wheat crop rotation, the soil has become low in organic carbon and deficient in other major and minor plant nutrients which resulted in stagnation of crop productivity. This problem has aroused mainly due to the breakage of cycle between soil, plants and animals. In the district there are 93510 cows, 441647 buffaloes, 88108 sheep, 74397 goats and 275895 poultry birds. Total livestock produces plant nutrients worth crores of rupees. More than 50% of these nutrients are wasted due to improper disposal and storage of farm yard wastes. The farm yard waste is generally stored on the sides of roads and water ponds. It not only creates sanitation problem in villages but plant nutrients worth million of rupees are wasted also. The water stored in the village ponds is destroyed and becomes unsuitable for animal use. The animals using this water face health threats. The improper disposal of farm wastes becomes breeding centre for mosquitoes and other disease causing organisms. Thus causing a serious threat to the human and livestock health .Establishment of 20-25 manure pits is proposed in each village of the district during the 11<sup>th</sup> five year plan to overcome the problems stated above. For digging pits for suitable conversion of farm waste into good quality manure to improve soil health and crop productivity Rs. **50.0 lac** will be required for **10000** pits.

**Table-44 Proposal for farm and animal disposal pits**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
No. of Pits to be prepared	2000	2000	2000	2000	2000	10000
<b>Funds required @ Rs.500/pit (lacs)</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>50.0</b>
<b>Total Cost of the Project</b>						<b>50.0 lacs</b>

**11. Mineral mixture feeding**

Due to over exploitation of land with extensive cultivation and poor recycling of farm wastes the soils have become deficient in plant nutrients. Deficiency of macro nutrient particularly Ca and P. etc. have severely affected the health and breeding efficiency of dairy animals. Reproductive problems vi.z age at first heat, age at first calving, calving interval, conception rate and vaginal prolepses and other deficiency syndrome have severely affected the productive ability of dairy animals, slow calf growth , poor animal health and low digestibility are other severe threats associated with mineral deficiency in feeding straw, fodder and other feed stuffs. A survey conducted by animal nutrition department of CCS HAU,Hisar as shown deficiency of calcium, copper, zinc and manganese in the milch buffaloes of the Bhiwani district. Encouraging results have been obtained by supplementing 50-60 grams of quality mineral mixture per day in the ration of the lactating animals. Since, milk is the main constituent of human diet in Bhiwani district, the deficiency of minerals in milk obtained by feeding mineral deficient fodder has become a great cause of concern to human health as well. To overcome the deficiency problem in dairy animals it is proposed to conduct demonstrations on mineral mixture supplementation in the rations of milch buffaloes of the district during the 11<sup>th</sup> plan period.



### Supplementing mineral mixture to dairy animals in District Bhiwani

Narrative Summary	Objectively verifiable indicators
<p><b>Project goal-</b> To increase milk yield and to reduce infertility and inter calving period in animals.</p> <p><b>Purpose-</b> To over come the deficiency of the essential minerals in order to increase milk yield and to improve the general health of the dairy animals to overcome infertility , repeat breeding and delayed calving.</p> <p><b>Output-</b>Increase in the production of the milk and thereby increase in income of the farmers. Reduction in inter calving period.</p>	<p>Out of 15000 animals covered under the project each year (by involving Gram Sabha members and field level Vety. Personnels for general health improvement and increase in milk yield.</p>

**Cost of the Project: 562.5 lacs**

**Table-45 Proposal for mineral mixture feeding**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
No. of lactating animals	150000	150000	150000	150000	150000	750000
No. animals covered under mineral mixture	15000	15000	15000	15000	15000	75000
Mineral mixture required @ 50g/day/animals for 300 days(kg)*	225000	225000	225000	225000	225000	1125000
Cost @ Rs. 50/kg (lacs)	112.5	112.5	112.5	112.5	112.5	562.5

\* Mineral mixture will be supplied to farmers free of cost.

### DEWORMING

In Bhiwani district about 150000 calves are born every year. The calf mortality ranges from 20-30 % up to one year of age. Such a high rate of calf mortality is cause of concern. Untimely, over and low quantity of colostrum feeding, worm infestation at young age, extreme climatic conditions coupled with poor general care of calf at young age are some of the main reasons responsible for this high rate of calf mortality. Continuous deworming of calves up to at least 6 months of age with first dose at 10-15 days of age can reduce 60% of the calf mortality. The internal parasites cause high economic losses to the

dairy owners due to death of calf, whereas, poor or retarded growth of calves is the biggest matter of concern. The sexual maturity of female calf is determined by its body weight and not by age. Reducing the average age at first calving by obtaining the desired body weight is very important to increase the profitability of livestock keepers. Use of dewormers enhances the gain in body weight with normal diets, the calves are fed thereby reducing the age at first calving. Therefore, it is of utter importance to include the deworming campaigns, trainings and demonstrations in the programme of 11<sup>th</sup> five year plan.

### Deworming of dairy animals in District Bhiwani

<b>Narrative Summary</b>	<b>Objectively verifiable indicators</b>
<p><b>Project goal-</b> To reduce the calf mortality and improve their general health.</p> <p><b>Purpose-</b>To increase the number of animals for enhanced milk production. To improve the general health of the dairy animals.</p> <p><b>Output-</b>Increase in the production of the milk and thereby increase in income of the farmers. Reduction in calf mortality</p>	<p>The impact of deworming project on calf mortality rate and general health of the animals will be studied through field survey by involving PRIs, Vety. Staff and KVK.</p>

**Cost of the Project: 112.5 lacs**

**Table-46 Proposal for deworming in calves**

<b>Description</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-2012</b>	<b>Total</b>
No. of Calves born (Lac)	1.50	1.50	1.50	1.50	1.50	7.50
No.(%) of calves Covered under deworming	15000	15000	15000	15000	15000	75000 (10%)
<b>Cost of DW req. @ Rs.150/calf/ yr (Lacs)</b>	<b>22.5</b>	<b>22.5</b>	<b>22.5</b>	<b>22.5</b>	<b>22.5</b>	<b>112.5</b>

### Fodder production programme and balanced feeding of dairy animals

Feed and fodder accounts for 70-75 % of the total cost of milk production. Profitability and viability of any dairy production system depends on feed and fodder

availability and feeding management of dairy animals. Feed and fodder availability is continuously decreasing to livestock due to increasing demands of land for grain production. The environmental conditions and topography of district further hinders th fodder availability for livestock, thereby increasing the dependency on concentrate feeding. In the recent years lucrative minimum support price of rice and wheat has led the farmers to further decrease area under fodder crops leading to poor availability of green fodder for dairy animals.. Adequate availability of green fodder round the year, not only improves the health of animals but also reduces the cost of production considerably.

Keeping in view the constraints explained above the only viable alternate to overcome the problem is to give big insentive to farmers for growing green fodder in larger areas. Other problems associated with feeding are, underfeeding , over feeding, imbalanced feeding and mineral deficiency. There is a common practice in the villages to take care of milch animals only whereas, young ones, heifers and non lactating animals are generally ignored. This practice is not desirable. The calf and heifers ignored at young age delays the age at sexual maturity and lack of proper feeding and care during dry period of non lactating animals adversely affects the health and milk productivity of the animals in subsequent lactations. Balanced feedings improves the body weight gain, reduces the age at first calving, overcomes the problem of mineral deficiency and helps in increased milk production by dairy animals. For educating the farmers for this important aspect of animal husbandry, it is proposed to conduct 2000 hectares demonstrations on fodder productions and 100 demonstrations on balanced feeding every year during the 11<sup>th</sup> five year plan period.

**Table-47 Proposal for demonstrations on fodder productions (ha)**

Description	2007-08	2008-09	2009-10	2010-11	2011-2012	Total
Rabi	1000	1000	1000	1000	1000	5000
Cost @ Rs.5000/ha	50.0	50.0	50.0	50.0	50.0	<b>250.0</b>
Kharif	1000	1000	1000	1000	1000	5000
Cost @ Rs.5000/ha	50.0	50.0	50.0	50.0	50.0	<b>250.0</b>
<b>Grand Total (lac)</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>500.0</b>

**Table-48 Proposal for demonstrations on balanced feeding of dairy animals**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	100	100	100	100	100	500
<b>Cost/ demo @ Rs. 5000</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>25.0</b>

**Facility for Community Bulls for 285 villages**

In Bhiwani district, there are about 285 villages without any veterinary institution and lack A.I facilities. In the absence of A.I. facilities, the farmers are using nondescript animals for breeding their animals. This has resulted in decline in productivity of dairy animals. For increasing the milk production and income from milch animals, an efficient and practical animal breeding system is of immense importance. The success rate of A.I. in the buffaloes is very low and the reason for this are manifolds. Therefore, it is proposed that bulls of proven breeding ability may be provided in each village with maintenance allowance. The duty of maintaining bulls can be assigned to a person of good repute in the village itself. .

**Conservation of murrah buffalo breed through Community Bulls**

<b>Narrative Summary</b>	<b>Objectively verifiable indicators</b>
<p><b>Project goal-</b> To improve the breed of murrah buffalo and to increase the productivity</p> <p><b>Purpose-</b>To increase the milk production and conserve the murrah buffalo breed.</p> <p><b>Output-</b> Decrease the problem of repeat breeding in buffalo. Reduction in calving interval. Increased milk productivity.</p>	<p>Supply of 70 bulls to gram panchayats every year.</p> <p>Milk productivity be increased from 4.5 lit/animal/day to 6.5lit/animal/day within the plan period.</p>

**Table-49 Project on provision of Community Bulls**

<b>Description</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>Total</b>
Number	70	70	70	70	70	350
Bull Cost @1.0 lac	70.0	70.0	70.0	70.0	70.0	350.0
Bull maint. Cost 0.25/bull/yr	17.5	17.5	17.5	17.5	17.5	87.5
<b>Total(in lacs)</b>	<b>87.5</b>	<b>87.5</b>	<b>87.5</b>	<b>87.5</b>	<b>87.5</b>	<b>437.5</b>

**Income and employment generation of landless farmers through piglets, sheep, goats and backyard poultry.**

Before the formation of Haryana state, each household in the villages owned one or the other livestock enterprise. The farmers were rearing cows and buffaloes for farm power and milk production, whereas, landless farmers used to rear sheep, goats, pigs and backyard poultry for meat and milk production. These small animals were maintained by grazing on common lands, by the sides of rail, roads and fellow lands which were found in abundant at that time. Improvement in irrigation facilities and demand for more food grains left no scope/ place for maintaining these animals. As a result these small enterprises vanished away from the system resulting in unemployment among the poor sections of the society. To generate income and employment for this section of the society, efforts are required to again start these enterprises. These enterprises will fulfill the increasing demand of milk and meat, therefore introduction of these small enterprises is proposed with in the XI th Five Year Plan.

**Table-50 Proposal for piggery, sheep, goat and poultry**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
3+1 piglets/ beneficiary to 20 households of SC/ST	80	80	80	80	80	400
Cost @ Rs. 600/piglet	0.48	0.48	0.48	0.48	0.48	2.4
6+2 Young one of sheep & goat/ beneficiary to 20 households of SC/ST	160	160	160	160	160	800
Cost @ Rs. 800/ young ones	1.44	1.44	1.44	1.44	1.44	7.2
Back yard Poultry 10+1 Chicks to 100 SC/ST Households	1100	1100	1100	1100	1100	5500
Cost @ Rs. 30/chick	0.33	0.33	0.33	0.33	0.33	<b>1.65</b>
<b>G. Total</b>	<b>2.25</b>	<b>2.25</b>	<b>2.25</b>	<b>2.25</b>	<b>2.25</b>	<b>11.25</b>

**Conservation of Village ponds**

In rural Haryana, the villages were established on higher topographies by using scientific minds by the ancestors. One or more pond was constructed in each village with the objective of harvesting rain water, protection of village from the floods and using the harvested water for drinking of animals throughout the year. With the passing of time and increase in population, the condition of village ponds deteriorated beyond repair. The village ponds are important resources for the reasons stated above. Up to now no serious efforts have been made to conserve these ponds on scientific lines for the purpose they were constructed. Extensive use of soaps and detergents, throwing of animal waste in or near the ponds has made these ponds purposeless. With the slight rainfall, flood like situations are created near the ponds and the pollution caused by these ponds have posed a serious threat to human population in these villages due to decreasing water holding capacity of these ponds. There is no valid reason why the matter should not be addressed suitably at the earliest. Therefore, it is proposed to conserve 90 ponds in Bhiwani district during the 11<sup>th</sup> five year plan period.

**Table-51 Proposal for conservation of village ponds**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	10	20	20	20	20	90
<b>Funds Req.@ Rs.5 lac</b>	<b>50.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>450.0</b>

**Commercial Dairy Farming**

In Bhiwani district, there are 207000 farm families of various land holding sizes\.. More and more number of farmers are coming into the category of marginal and small farmers due to division of land holdings. Buffalo is the main milch animal in the district. The cost of the good animal has increased to more than Rs. 30,000 per animal. Due to the small land holdings, high cost of animal, it has become very difficult to maintain dairy animals. The demand for milk is continuously increasing from urban areas. The milk price in the area reaches up to Rs. 25/- per liter particularly during the lean periods. Milk being an important component of diet, is becoming a scarce commodity for the low and middle class families in the urban and rural areas of Bhiwani district.

The reasons stated above demand the introduction of large commercial dairy farms, which can be run on economy of scale. The automation of this enterprise can bring down the cost of milk production, thereby making a good scope for commercially viable large sized dairy farms. Therefore, the proposal is submitted for introduction of 100 commercial dairy farms in the district during the proposed plan period.

**Table-52 Proposal for commercial dairy trainings**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number of Trainings for seven days	10	10	10	10	10	50
No. of Trainees 25/ trg.	250	250	250	250	250	1250
<b>Cost/ training @ Rs. 1200/Trainee for 6 days</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>15.0</b>

**Table-53 Proposal for Commercial Dairy Units to be established**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	10	15	20	25	30	100
Cost @ 20 l/unit	200	300	400	500	600	2000
<b>Subsidy @ 25%</b>	<b>50.0</b>	<b>75.0</b>	<b>100.0</b>	<b>125.0</b>	<b>150.0</b>	<b>500.0</b>

**Income and employment generation through agro based vocations****a) Vermi-composting**

Animal and plant wastes are rich source of all plant nutrients which are required for improvement of soil health and sustainability of crop and animal production. Unfortunately recycling of these nutrients is not done in a proper way. Most of plant residues and cow dung are either burnt or put at undesired places leading to soil and water pollution on one hand and loss of plant nutrients on other hand in terms of worth billion of rupees. Vermis composting is an excellent method for recycling the farm wastes and cow dung into valuable organic manure.

<b>Narrative Summary</b>	<b>Objectively verifiable indicators</b>
<p><b>Project goal-</b> To improve soil health and sustainability of crops through integrated nutrient management.</p> <p><b>Purpose-</b> Farm/animal waste management through vermi-composting.</p> <p><b>Output-</b> To increase the productivity of crops by improving soil health, recycling of farm wastes and animal dung into quality manure.</p>	<p>The impact of vermin-compost application on soil health will be studied in terms of organic content. Reduction in nitrogenous fertilizer application. 50% of animal dung will be converted into vermin-compost during the plan period.</p>

**Table-54 Proposal for Vermi-compost Units to be established**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	20	20	20	20	20	100
<b>Financial help @Rs. 0.30 lacs/unit</b>	<b>6.0</b>	<b>6.0</b>	<b>6.0</b>	<b>6.0</b>	<b>6.0</b>	<b>30.0</b>
<b>Total Cost of the Project(lacs)</b>						<b>30.0</b>



## b) Bee Keeping

The land holding in the district is small. So to increase income of the farmer and to get employment through out the year other allied vocations like Bee- keeping should be adopted by farmers. This occupation can be done by women and old man also. With 10 boxes one can get extra income of Rs. 10000 per annum. This vocation do not require any additional land. The other additional benefit of bee keeping is that it increased the yield of cross pollinated crops.

**Table-55 Proposal for bee keeping units to be established**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	10	10	10	10	10	50
<b>Financial help @ 0.2 lacs/unit</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>2.0</b>	<b>10.00</b>
<b>Total Cost of the Project(lacs)</b>						<b>10.00</b>

## Agro- Forestry

Demographically Bhiwani is the largest district but it has only 3442 ha under forest, which comprises only 0.74% of total area. But according to National Forest Policy 1989 about 25 % area of plain should be under tree covers for pollution control and sustainable production in any area. In spite of all efforts by forest department and other agencies involved for planting of trees, the forest area is not increasing in the district. The only scope for increasing the forest covers in the district is on the farmer's fields. Khejri, Rohera, Neem, Alanthus & Shisham can be planted successfully under agro-climatic conditions of Bhiwani. The plantation of trees on the farmer's field not only increase the forest area in the district but also enhance the productivity of the farmer fields which ultimately increase the net income of the farmers on sustainable basis. For this extension activities like trainings, demonstrations of different trees especially Khejri, Rohera, Neem, Alanthus & Shisham are to be intensified in the coming years. The details regarding demonstrations of poplar during the 11<sup>th</sup> five year plan has been given as under:

**Table-56 Proposal for demonstrations on Khejri, Rohera, Neem, Alanthus & Shisham**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number of demonstration	50	50	50	50	50	250
<b>Cost/ demo @ Rs. 0.1lac</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>25.0</b>
<b>Total Cost of the Project(lacs)</b>						<b>25.0</b>

**Table 57 Project proposal for nutritional gardens near or around tube wells**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number of demonstration	11000	11000	11000	11000	11000	55000
Cost (Rs. In lacs)	110.0	110.0	110.0	110.0	110.0	550.0
<b>Total Cost of the Project (lacs)</b>						<b>550.0</b>

Cost/ demonst. @ Rs. 100

### **Survey, Monitoring and Evaluation**

The constant monitoring and evaluation is the key for setting need based area specific priorities. The agenda for future extension and research action should compulsorily be based on seasonal assessment of different agricultural phenomena in the district.

The season based performance assessment will result into cost savings, eliminating uneconomical and low performing technologies, practices affecting the productivity.

**Table-58**

S. No.	Survey, assessment, monitoring and evaluation of	Financial requirement (in lacs)					
		2007-08	2008-09	2009-10	2010-11	2011-12	Total
1	Technologies and practices affecting the productivity	5.0	5.0	5.0	5.0	5.0	25.0
2	Yield performances of crops and varieties	5.0	5.0	5.0	5.0	5.0	25.0
3	Adoption pattern of crucial technologies across the regions and catagories of farmers	5.0	5.0	5.0	5.0	5.0	25.0
4	Incidence and occurrence of insect, pest and weeds	5.0	5.0	5.0	5.0	5.0	25.0
5	Resistance development and sustainability issues	5.0	5.0	5.0	5.0	5.0	25.0
6	Ground water quality in relation to nitrate and heavy metal contamination	5.0	5.0	5.0	5.0	5.0	25.0
7	Economics of crops , crop rotations and farming systems	5.0	5.0	5.0	5.0	5.0	25.0
8	Economic and social progression	5.0	5.0	5.0	5.0	5.0	25.0
	<b>TOTAL</b>	<b>40.0</b>	<b>40.0</b>	<b>40.0</b>	<b>40.0</b>	<b>40.0</b>	<b>200.0</b>

**Project proposal training for training of para technical staff at regional/ state level**

The proposals are meant for stimulating the extension and developmental activities by providing necessary technical back up, specialized services and analytic support with respective fields. The proposals are as under-

- i) Training facilities for para technical staff dealing in
  - Soil and water analysis
  - A.I. Services
  - Nursery management
- ii) Establishment of organic certification lab
- iii) Establishment of poultry hub

### **Installation of Solar photovoltaic (SPV) pumps for popularising non-conventional energy usage in farming.**

The pumping out cost of irrigation water is becoming costlier day by day. The rising cost of diesel and rationalizing of power tariffs will further aggravate this situation for the farmers. Besides adopting water use efficiency measures, the only viable of sun left to the farmers to switch towards non conventional energy usage for pumping out the irrigation water. This could be done by harnessing the solar energy through SPV pumps. The technology is available for converting the abundant sunshine into electricity for farm and home usage. With slight addition/ modification the system can produce and output even during non sunshine hours.

#### Advantages of SPV water pump

- Save expenditure on diesel and electricity as it operates on freely available in solar energy.
- Negligible operation and maintenance cost.
- Reliable and pollution free long life.
- No fear of power cuts.
- Scarcity of diesel.

**Table 59 Project Proposal for SPV installation in blocks of higher water table**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
No. of SPV units to be installed	35	35	35	35	35	175
Financial Requirement @ Rs.3.5lacs/SPV set	122.5	122.5	122.5	122.5	122.5	612.5

**Table 60 Project Proposal for SPV installation in blocks of lower water table**

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
No. of SPV units to be installed	35	35	35	35	35	175
Financial Requirement @ Rs.5.5lacs/SPV set	195.25	195.25	195.25	195.25	195.25	976.25

**Total cost of the Project= 612.5+976.25=1588.75**

**Physical and Financial Programme Proposed for development of Agriculture Sector under CDAP during XI plan.**

**(Phy. Nos/ha, Rs. In Lac)**

Sr. No.	Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	A.Activity												
1	Trainings												
	In Service	800	4.8	800	4.8	800	4.8	800	4.8	800	4.8	4000	24.0
	Farmers	9950	62.8	9950	62.8	9950	62.8	9950	62.8	9950	62.8	49750	314.0
2.	Demonstrations												
	Varietal	7200	360	7200	360	7200	360	7200	360	7200	360	36000	1800.0
	INM	8800	440	8800	440	8800	440	8800	440	8800	440	44000	2200.0
	IPM	550	27.5	550	27.5	550	27.5	550	27.5	550	27.5	2750	137.5
	RCTs	1850	92.5	1850	92.5	1850	92.5	1850	92.5	1850	92.5	9250	462.5
	Seed treatment	32000	85.0	32000	85.0	32000	85.0	32000	85.0	32000	85.0	160000	425.0
3.	Other activities												
	FFSs	85	17.0	85	17.0	85	17.0	85	17.0	85	17.0	425	85.0
	Group formation	40	8.0	40	8.0	40	8.0	40	8.0	40	8.0	200	40.0
	Total A	61275	1097.6	61275	1097.6	61275	1097.6	61275	1097.6	61275	1097.6	306375	5488.0
4.	B. Special Project												
	Strengthening of Training Centre												
	a) District level (KVK)	1	83.0									1	83.0
	b) Block level (FIAC)	10	400.0									10	400.0
	Strengthening of lab.	3	60.0									3	60.0
	Rain water harvesting	250	250	300	300	300	300	300	300	300	300	1450	1450
	Reclamation of Alkali soils	2000	55.0	2000	55.0	2000	55.0	2000	55.0	2000	55.0	10000	275.0

Improving soil health through Green Manuring	20000	68.5	20000	68.5	20000	68.5	20000	68.5	20000	68.5	100000	342.5
Sulphur Application	20000	144	20000	144	20000	144	20000	144	20000	144	100000	720.0
Laser levelling	2400	54.0	2400	54.0	2400	54.0	2400	54.0	2400	54.0	12000	270.0
Napier grass + drip	150	126.66	200	168.88	200	168.88	250	211	250	211	1050	886.6
Intercropping	50	4.7	50	4.7	60	5.6	70	6.5	80	7.4	310	28.9
Wheat Seed production-	500	25	500	25	500	25	500	25	500	25	2500	125.0
Total B		1270.86		820.08		820.98		864.0		864.9		4640.82
G.Total (A+B)		2368.46		1917.68		1918.58		1961.60		1962.50		10128.82

**Physical and Financial Programme Proposed for development of Allied Agricultural Sectors under CDAP during XI plan.**

**Phy. In Nos/ha (Rs. In Lach)**

Sr. No.	Sector/Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	All Allied Sectors												
1.	Trainings												
	In Service	700	4.2	700	4.2	700	4.2	700	4.2	700	4.2	3500	21.0
	Farmers	4290	40.16	4290	40.16	4290	40.16	4290	40.16	4290	40.16	21450	200.8
2.	Demonstrations												
	A) Horticulture												
	Varietal	150	5.6	175	6.6	200	7.5	225	8.4	250	9.4	1000	37.5
	INM	140	7.0	175	8.75	200	10.0	225	11.25	260	13.0	970	48.5
	IPM	175	1.62	200	1.8	225	1.97	250	2.15	275	2.32	1125	9.87
3.	Demonstration on Allied Sector Activities	1390	6.5	1390	6.5	1390	6.5	1390	6.5	1390	6.5	6950	32.5
	FFSs (All Allied Sectors)	160	32	160	32	160	32	160	32	160	32	800	160.0
	Group formation	96	19.2	96	19.2	96	19.2	96	19.2	96	19.2	480	96.0
	Total A		116.28		119.21		121.53		123.46		126.78		607.26
4.	B. Special Project												
	Horticulture Seed production of	12	0.9	12	0.9	12	0.9	12	0.9	12	0.9	60	4.5
	Carrot	12	0.9	12	0.9	12	0.9	12	0.9	12	0.9	60	4.5
	Onion												
	Animal Husbandry												
	Strengthening of Vet. Hospitals		600										600.0
	Supplementing Mineral Mixture	15000	112.5	15000	112.5	15000	112.5	15000	112.5	15000	112.5	75000	562.5
	Deworming	15000	22.5	15000	22.5	15000	22.5	15000	22.5	15000	22.5	75000	112.5



Sr. No.	Sector/Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Fodder Production	2000	100	2000	100	2000	100	2000	100	2000	100	10000	500.0
	Balanced Feeding	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	500	25.0
	Commercial Dairy Training	10	3.0	10	3.0	10	3.0	10	3.0	10	3.0	50	15.0
	Commercial Dairy Units	10	50.0	15	75.0	20	100.0	25	125.0	30	150.0	100	500.0
	Village Ponds	10	50.0	20	100.0	20	100.0	20	100.0	20	100.0	90	450.0
	Community Bulls	70	87.5	70	87.5	70	87.5	70	87.5	70	87.5	350	437.5
	Piggery	80	0.48	80	0.48	80	0.48	80	0.48	80	0.48	400	2.4
	Goat	160	1.44	160	1.44	160	1.44	160	1.44	160	1.44	800	7.2
	Backyard poultry	1100	0.33	1100	0.33	1100	0.33	1100	0.33	1100	0.33	5500	1.65
	Farm & Animal disposal Pits	2000	10.0	2000	10.0	2000	10.0	2000	10.0	2000	10.0	10000	50.0
	Vermicomposting	20	6.0	20	6.0	20	6.0	20	6.0	20	6.0	100	30.0
	Bee Keeping	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
	Agro Forestry	50	5.0	50	5.0	50	5.0	50	5.0	50	5.0	250	50.0
	Total B		1057.55		532.55		557.55		582.55		607.55		3337.75
	G. Total (A+B)		1173.83		651.76		679.08		706.01		734.33		3945.01

**Table : Physical and Financial Programme Proposed under CDAP during XI Plan****(Rs. In lakh)**

Name of Work	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Agriculture		<b>2368.46</b>		<b>1917.68</b>		<b>1918.58</b>		<b>1961.6</b>		<b>1962.5</b>		<b>10128.82</b>
Allied sectors		<b>1173.83</b>		<b>651.76</b>		<b>679.08</b>		<b>706.07</b>		<b>734.33</b>		<b>3945.01</b>
Total		<b>3542.29</b>		<b>2569.44</b>		<b>2597.66</b>		<b>2667.67</b>		<b>2696.83</b>		<b>14073.83</b>

## **Concluding remarks**

The district falls in semi arid and sub tropical agro climatic zone and it lies along with the Rajasthan state, therefore it is the hottest and driest district of the state. The mean annual rain fall is about 350 mm with unevenly distributed throughout the year. Therefore, we systematically need to focus our activities throughout the value chain on the challenges of sustainable agriculture development starting from production to processing and from crop based enterprise to all other enterprises that help farmers to raise their income and remain engaged at the same time. Goal is to increase productivity at 4% per year, reduce water consumption by 10% in each cropping system, energy consumption by 10%. Savings in energy consumption is expected to reduce the associated carbon dioxide emissions. The price of already subsidized diesel will rise further. Technologies like zero-tillage for conservation agriculture are available that can reduce the energy consumption and increase profits. In future the reducing size of operational land holding will demand use of these technologies to increase resource use efficiency.

Demand for labour from states like Bihar & UP, which is the biggest source of migrant labour is increasing. The most obvious source of GDP growth is now coming from service and industry sector. It has started engaging more labour. The availability of migrant labour for cotton picking, harvesting, and other agriculture operations including grading and processing of grains, vegetables and fruits will decrease. This will demand still more mechanization for sowing, harvesting, storage and processing. On the contrary, family labour especially the unskilled labour can not derive their income solely from crop based agriculture. Agriculture now must diversify across commodities and enterprises that promise a secure future to the young boys and girls of farm families. Unless off-farm and on-farm opportunities are not found, it may create social problem. Therefore, there is need to identify farm enterprises like dairying, bee-keeping, vermi- composting etc.

The increased targets of eleventh five year plan could be met only by the greater adoption of efficient higher technology levels in all cropping systems especially in blocks where input use is less. This would require large scale availability of machinery for land leveling (laser land leveller), tillage (especially zero tillage machines, bed planter, cotton picker and precise placement of seeds and fertilizers at the appropriate depths especially in

South West Haryana. It is expected that the custom hire services will be encouraged. It is also expected that more land will be available on lease and therefore, farmers would need more machinery for saving labour and increasing the efficiency of inputs. Yield level of top 10 per cent farmers may be assumed as an attainable yield in any coming season. The exercise of monitoring yield levels in each districts must be done for planning for the next season. This exercise may be made mandatory for each KVK and should form the part of planning process for any current year. Time has now come to again review the recommendation of fertilizer and to meet the target of attainable yield of top 10 per cent farmers, the recommendations of fertilizers may have to increase from current level.

As the computing has become easy and affordable, extension services and or technologies can be out sourced from any where. As it happened in case of Bt cotton and hybrid vegetables, more and more linkages and synergies need to be developed by outsourcing technologies. More and more infrastructure, facilities need to be put to use with DDA's, DHO, Animal husbandry officers, Fishery officers which then can be linked to KVK's for a perfect integration of agriculture. Data centers need to be created to increase the computing capacity of extension workers. Data centers for the district may be located at the KVK as part of knowledge centers. The data centers for the state may be located at main campus of CCS HAU, Hisar. A lot of wasterful expenditure owing to wrong priority setting and misleading feedback can be altogether avoided on the basis data based scientific analysis. The constant monitoring will help in priority settings as per the required needs of the farmers. The KVK and technical staff of respective departments and personnel from private or non government organisations can collaborate in conducting of such surveys.