

**DRAFT PLAN**

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

**DISTRICT AMBALA  
HARYANA**

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

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## CONTENTS

CHAPTER -I		Introduction	1
CHAPTER-II		General Description of the District	6
	2.1	Introduction	6
	2.2	Location and Geographical Units	6
	2.3	District at a Glance	6
	2.3	The Vision	9
CHAPTER-III		SWOT Analysis	13
CHAPTER-IV		Development of Agriculture Sector	16
	4.1	Introduction	16
	4.2	Land use :	16
	4.3	Soil Health	18
	4.4	Water Resource and management.	18
	4.5	Farm Mechanization :	19
	4.6	Major crops and varieties in the district.	20
	4.7	Input management	20
	4.9	Constraint Analysis :	22
	4.11	Recommended interventions for the district with detailed action Plan with costs	41.
	4.12	Projected outcome and growth rate during the plan period:	42
	4.13	Research Issues	42
	4.14	Integrated pest management (IPM)	42
	4.15	Integrated nutrient management (INM)	43
CHAPTER-V		Allied agriculture Sectors	53
	5.1	Horticulture Development	53
	5.1.1	Constraints analysis in Horticulture	59
	5.2	Social Forestry	60
	5.3	Animal Husbandry	61
	6	Fisheries development	66
	6.1	Introduction and present status	66

	6.2	Development of Fisheries Water Resources:	66
	6.3	Strengthening of National Fish and Seed Programme	67
	6.4	Establishment of Fish seed farm/units by Fish Farmers :	67
	6.5	Financial Assistance to the Fish Farmers:	68
	6.7	Fisheries Education, Training & Extension:	68
CHAPTER-VI		District Plan	75
	6.1	Introduction	75
	6.2	Growth drivers	75
	6.3	Innovative Schemes:	77
	6.4	Vision of XI Plan	82
	6.5	Financial Proposals for XI plan in Agriculture and Allied Sectors	83

## LIST OF TABLES

Table 1	Area, Production and Yield of Major Crops in Irrigated/Rain fed Conditions during Kharif Season 2007-08.	17
Table 2	Depletion of Under ground water status in Ambala District.	18
Table 3	Spectrum of rice varieties and hybrids (H) grown by farmers in district Ambala	20
Table 4	Spectrum of wheat varieties grown by farmers in district Ambala	20
Table 5	Crop wise NPK Consumption	21
Table 6	Sustainability issues and gap analysis of Productivity of different crops and resources. in District Ambala	25
Table 7	Proposal for Seed Planning	43
Table 8	Proposal or Demons on R.C.T.	44
Table 9	Proposal for Water Management Demons	44
Table 10	Proposal for SSNM	45
Table 11	Proposal for IWM	45
Table 12	Proposal for Extension activities on timely spraying of Wheat	45
Table 13	Proposal for Demons on hybrid rice and transplanter	46
Table 14	Proposal for Demons on SugarCane	46
Table 15	Proposal for Demons on Sun flower	46
Table 16	Seed and Seed treatment chemical requirement	47
Table 17	Proposal for Seed Treatment (Rs. in Lacs)	47
Table 18	Proposal for Seed Replacement Strategy	47
Table 19	Proposal for Seed Replacement in wheat & paddy (Rs. in Lacs)	48
Table 20	Proposal for Land Levelling through laser leveler (Rs. in Lacs)	48
Table 21	Proposal for INM demons	49
Table 22	Proposal for IPM Demons	49
Table 23	Proposal for Green manuring through Dhaincha	50
Table 24	Proposal for Summer Moong	50
Table 25	Proposal for Zero Tillage Machine (Rs. in Lacs)	50
Table 26	Roposal for Bed Planter (Rs. in Lacs)	51

Table 27	Proposal for Capacity Building of Agriculture Staff (Rs. in Lacs)	51
Table 28	Proposal for Capacity building of Agriculture farmer (Rs. in Lacs)	51
Table 29	Projected Out Come and growth rate during the Plan Period (Horticulture & Veggies) (Area - ha, Production – Q/ ha, Productivity --- Q/Ha.)	52
Table: 30	Area, Production and Yield of Major Horticulture Crops.	54
Table: 31	Area Expansion Plan of Horticulture Crops(Including vegetable crops)	55
Table 32	Rejuvenation Plan of Horticulture Crops	55
Table 33	Mushroom information 2007-08, District Ambala	55
Table: 34	Proposed Physical and Financial Targets Mushroom for XI Plan	56
Table 37	Expenditure/layout plan proposed for next five year plan is as follows	66
Table 38	Projected Outlay for Fisheries Development during XI Plan	69
Table 39	Proposal for Demons on Hort & Veg Crops (Rs. in Lacs)	70
Table 40	Proposal for Capacity Building Horticultural staff (Rs. in Lacs)	70
Table 41	Proposal for Capacity Building of Hort. Farmer (Rs. in Lacs)	70
Table 42	Proposal for Bee Keeping Training (Rs. in Lacs)	71
Table 43	Proposal for Mushroom Training (Rs. in Lacs)	71
Table 44	Proposal for Vermi compost (Rs. in Lacs)	72
Table 45	Projected Out Come and growth rate during the Plan Period (Horticulture & Veggies) (Area - ha, Production – Q/ ha, Productivity --- Q/Ha.)	73
Table 46	Tools Utilized for improving Crop Production	79
Table 47	Financial outlays for different crops in XI Plan	83
Table 48	Financial outlays for Resource Conservation Technologies in XI Plan	84
Table 49	Financial outlays for different management activities(crops) in XI Plan	84
Table 50	Financial outlays for different other activities(crops) in XI Plan	84
Table 51	Financial outlays for different horticulture crops and subsidiary occupations in XI Plan	84

Table 52	Financial outlays for Animal Husbandry in XI Plan	85
Table 53	Financial outlays for Fisheries in XI Plan	85
Table 54	Financial outlays for Forestry in XI Plan	86
Table 55	Financial outlays for Agriculture and allied sectors in XI Plan	86
Table 56	Consolidated Plan of Distt. Ambala (Rs. in Lacs)	87

## CHAPTER -I

### Introduction

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 percent 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 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. The Tenth five year plan target of growth of 4 percent per annum in agriculture and allied sectors, set to reverse the sharp deceleration of 1996-1997 to 2001-2002 has not been achieved. A sustained and wide spread agricultural growth is a pre-condition of development in India as more than 50 percent of country's work fare still depends upon agri. for its livelihood. This slow growth in agriculture (including allied sectors) can be of great strain for the economy. Concerned over this pace of growth in agriculture and allied sectors, the National Development Council (NDC), in its meeting held on 29<sup>th</sup> May, 2007 resolved that a special Additional Central Assistance Scheme i.e. National Agriculture Development Programme/ Rastriya Krishi Vikas Yojana (RKVY) be launched with following main objectives .

#### **The main objectives of the scheme are:**

- ▶ To incentivise 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 incentivise 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 XI th 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 agriculture growth being essential element of the strategy of making growth more inclusive, the NDC advised the State Governments on 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 over come food shortage) based on specific endowments and needs of each area mooted in 1<sup>st</sup> Five year plan in 1951, 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 Ambala is prepared far 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 national, physical and financial resources.

The Agriculture in the district (as in the state too) can't possibly achieve same growth as in the past without recognizing the role of farmers' participatory approach for formulating strategies and finding solution to new and emerging problems. Similarly due to globalization, trade in agriculture will expand and the farmers of the district can hugely benefit when the trade expands and our farmers start making best use of such changes by becoming as secondary producer rather than a primary producer of agriculture commodities. The district is facing host of new problems related to decrease in total factor productivity and problems of unemployment. Hence reforms based on globalization can now pave the way for subsidiary occupations along with farming. Issues related to soil health, decline in water table and emergences of new weed flora and herbicides resistance in rice-wheat cropping system. Although there are number of reasons for the falling aggregates yield growth rates are many but the integrated crop management has come out as the key variable to improve farm productivity considering the climatic resources there is a possibility of closing the exploitable gap in favor of technologies like intercropping water management, soil surface residues, direct seeded Paddy etc. along with suitable and profitable diversifications system for sustainable soil health and productivity.

### **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, Hissar, Haryana was identified as Technical Support Institute (TSI). The TSI, under the guidance of Director, Extension 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 meeting and did hand holding where ever needed for plan preparation.

The responsibility of preparing C-DAP of Ambala district was given to Krsihi Vigyan Kendra, Amabala City .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 27-03-2008 and 28-03-2008 Ambala City. The following specific aspects were covered in the programme.

- Issue and challenges in Agriculture sector.
- Planning concepts and district Planning.
- Basic features and planning process of RKVY.
- Vision, methodology and process of preparing C-DAP.
- Participatory 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/Institutional arrangements under ATMA scheme). Formal and informal meeting with Agriculture and line department staff, Panchayati Raj institution's members and farmers 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 into two distinctively Agro-eco-situations (AESs) as was done for SREP preparation under ATMA scheme. From each AES one representative village sakraon from AES-I and Rachedde from AES –II) was selected for collecting required information on modified semi-structured 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/reports

available with different government departments and PRA based exercises (earlier conducted by KVK and other agencies.) The district plan (draft), SREP and PLP of Ambala district and other related documents/reports of different departments were consulted for preparing the C-DAP.

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

- Adoption of resources conservation technologies at large scale.
- Farm productions system for land owing families.
- Soil health sustainslity through the applications of fertilizers & other mgt practices.
- Effective pest management strategies including weed & nematodes based on economic threshold value.
- Decline in water table calls for augmentation of the existing water applications through rain water conservation and demand management.
- Farmer and scientist came to general agreement on what to do to fill the gap on crops and allied activities.

**System approach keeping in view the following:**

1. Profitability and sustainability of cropping system and return.
2. Market infrastructure and marketing opportunities, custom hiring services and some of the policy issue related to subsidy.
3. Farmer inability to invest in the productivity enhancement as majority of farmers belongs to resources poor category.
4. Livelihood support system for landless families.
5. Collected and discussed the feed back regarding on-Farm and Off-Farm activates.

## CHAPTER-II

### GENERAL DESCRIPTION OF THE DISTRICT

#### 2.1 Introduction

#### 2.2 Location and Geographical Units

Ambala enjoys the unique privilege to serve as gateway to the states of HP, Punjab and UT of Chandigarh. With the passage of time its geography has changed no. of times but its name, basic characteristic and H.Q. continue to be same. Ambala Comprises two Sub-Divisions Ambala and Nariangarh. There are 495 villages and 430 Panchyats. These have been grouped into Six development Blocks i.e. Ambala -1, Ambala-2, Saha, Brara, Nariangarh and Sahajadpur. The District is completely electrified. The literacy rates is also quite high in comparison to State literacy rate and is among forwarded District. Ambala City is known for mixing manufacturing, Ambala Cantt for Scientific Instruments. Ambala City has big cloth marketing which cater to the needs of cloth vendors , retail traders and individuals. The city known for old Ahatas (complex) like Patiala house, Manali House, Jind House, Sarihand House which signifies the Princely status of the city in the past.

#### 2.3 District at a Glance

Agricultural description of District -

Geographical area	-	153731 ha
Area under forest	-	1174 ha
Barren land	-	2470ha
Cultivable waste land	-	196ha
Area under pasture	-	843h
Area under Tress and Grooves	-	196ha.

Present Fallow land	-	393ha
Cultivable area	-	135052ha
Cultivated Area	-	133817 ha.
Net Area Sown	-	133424 ha.
Area sown more than once	-	79000ha
Gross Cropped Area	-	299781ha.
Cropping Intensity	-	154.2%
Total Irrigated Area	-	127350ha.
By Tube well	-	111000ha.
By Canal	-	14000ha.
Type of Soil	-	Sandy loam & clay
Soil ph.	-	8.59
Annual Rainfall	-	1100mm

### 2.2.2 Demographic profile

#### A) Population , Density , Male, Female, Ratio, Literacy, Birth rate

i)	Population –total persons (2001)	1013660
i)	Male	542366
ii)	Female	471294
2	<b>Rural Person</b>	656997
i)	Male	349765

ii)	Female	307232
3.	Urban Person	356663
i)	Male	192601
ii)	Female	164062
4	Density of Population (per Sq. K.m)	644
5	Sex Ratio	869
6	Literacy Source	444314
i)	Male	263925
ii)	Female	180389
7	Persons Per Household	6

### **2.2.3 Topography and agro-climatic characteristics**

The soil of the district and fertile is useful for all kind of crop. The main crops are Wheat in Rabi Seasons and rice , maize and Sugarcane in Kharif Seasons . Natural resources like rainfall , climate , texture and fertility of the soil are good and useful. The district is suitable for growing fruits like Mango, Spota, Guava , Papaya and all sorts of vegetables . Potato and Onions are also extensively grown in the District.

The Climate of the District is categorized by humid tropical and dry winter, extreme seasonal temperature , long dry –short wet seasons and potential evapo-transpirations exceeding precipitation. The annual rainfall of the district is 1100mm. The rain fall in the reason is mostly in the monsoon season extending from Middle of June to Middle of October. The rainfall data for last 60 years at Ambala indicated that nearly 79.4% of the annual precipitation is received in these four months. The day temperature ranges from 20.8 degree in January to 40.8 degree in may where as the night temperature ranges from 6.8degree in January to 27.3 degree in June. The RH various from 21% in may to 82 % in August.

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

The area under irrigation (127350 ha.) to net sown (133000)ha. is 83.5% against the state average of 84.1%. Out of Total areas 111 thousand ha. through tube wells while only

14000ha. by canal. So the pressure on tubewells water increasing day by day and it is going to create a disastrous like situation for the farm sector of this district in near future. During the year 2006-2007 the availability of ground water reached upto depth of 220feet and up-liftment of water from this depth is a herculean task and also a very costly affair at the farmers level due to predominance of rice –wheat cropping system and dependence on under ground water for irrigation. The Brara and Sehjadpur block has been categorized as dark zone for ground water resource while rest of the block false under grey zone . There are 22160 tubewells and pumping sets in the districts to irrigate the land under agriculture . As per the observation of District hydroliogist the water table has gone down to 3 -5 feet in case of Shallow Tubewell while 10-15feet in case of deep tubewells every year.

### **2.2.5 Land Utilization Pattern**

Out of total geographical area of 153731 hectares, the cultivable area is 135052 ha. and net sown area is 133424 ha. The percentage of net sown area to total cultivable area is 92.3% which is very much close to State average of 93.1 %.

### **2.2.6 Farm mechanization:**

There are 7753tractors, 12800 harrows, 2500 zero till seed cum fertilizer drills, 5025 power threshers, 36combine harvesters, 12500 sprayers, 100 dusters, 238 straw reapers, 1 laser leveler, 2 bed planters in the district (2007).

### **2.2.7 Industries**

Ambala City is known for mixi manufacturing and Ambala Cantt. For scientific Instruments. This city also famous for manufacturing of seed processing units and its accessories. There are 63 rice shellors , 10 units of handmade papers , 16 units of cattle feed , 10 solvent extraction plant ,5 unit of Jams and sauces , 2 units of pickle and 20 units of straw board.

## **2.3 The VISION**

The Green revolution technology has prompted agricultural scientists to develop high yielding vars. of wheat and some of good hybrids in paddy . Subsequently the farmers of the



Ambala District has also shifted to these varieties and hybrids resulting in covering about 90% areas under them. The adoption of both vars. and hybrids coupled with improved technology and effecting price support and stocking policies by the Govt. have brought about significant increase in productivity of wheat and paddy. These developments put the region's agriculture on high growth path resulting into fast increase in the area under rice and wheat crops not only by substituting other crops but also through horizontal and vertical expansion in the cultivated area. 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, rising problems of insect-pest 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 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, pig, vermiculture, beekeeping, vegetables and mushroom 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. Sporadic success was achieved by relatively small number of farmers as the approach of crop enterprise concentration moved towards integration of some other enterprises. Notables are instances of integration of vegetable and mushroom cultivation and up to an extent poultry and fish farming where farmers have achieved commendable success otherwise majority of the farmer are experiencing low productivity and profitability because of low knowledge, inefficient integration without farming system technologies which include modern farm management skills that enable farmers to improve the efficiency, increase cropping intensity and to integrated 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 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 coupled 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 in crop enterprises (multiple) with judicious combination of allied enterprises complimenting with other through effective recycling of residues, wastes, bi products or the products itself. The allied enterprises are important part of the farming systems. The pace of development can be further accelerated through promotion of agro processing and establishment of manufacturing unit and promoting service sector . Both price and income elasticity's of demand for most of these enterprise's products are high. There is huge unfulfilled demand for 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, sorting , grading , packing and storing facilities in and around the district are added advantage for the farmers of this district.

## **VISION STATEMENT**

**Improving livelihood of rural households by rebalancing agriculture through conserving agriculture and an integrated diversified farming system.**

### **Priority setting for the district**

- Conservation, development and sustainable management of water resources.
- Soil health improvement
- Popularizing resource conserving technologies.

- Encourages multiple land use by increasing cropping intensity and intercropping.
- Integration of crop husbandry with vegetable and horticultural crops, animal husbandry, mushroom cultivation and other non crop based farming.
- Bridging yield gaps of crops, animals and other enterprises.
- Human resources development of rural youths, farm women, other disadvantaged groups and field staff.
- Paradigm shift from production oriented farming to market oriented agriculture with the promotion of Agro processing industries.

During 1970s and 1980s the green revolution technologies provided strong motivation to diversity crop sector in favour of high yielding cultivars of wheat and paddy in ambala district. Now the problem resulting from the same technology and near exhaustion of its growth potential coupled with other factors are pressing for another diversification in the district. Practically, little scope exists for a major shift to towards diversification but its steady pace since 1980s needed to be maintained more specifically in the light of new opportunities.

**By adopting a system approach the predominant paddy – wheat cropping system which now occupies more than 86 percent of the total sown area in the district has been extending to areas even with marginal quality ground matters continues use of marginal quality ground waters are of sodic nature, has implications for soil productivity in the long run.**

The district enjoy the advantages of amiability of green fodder, efficient system of rural transport and road network to more regiorsuly promoting commercial dairy. Mushroom, poultry, fish farming, sheep-goat and pig farming. The district also enjoys the locations wise advantage of being near the capital chandigarh which offers vast consumer market for the agri-produces. This kind of expansion will also be beneficial for improving soil health through increased availability of organic manure. Here, it is also to be understood that the increased adoption of less land using enterprises mentioned above are not the only solution, cutting cost and increasing the productivity is the best way to sustain the growth in agriculture and allied sectors.

## **CHAPTER-III**

### **SWOT Analysis**

SWOT as an acronym stands for strength, weakness, opportunity and threats of a technology or an organisation. These particulars basically serve as management tools for strategic decision making. SWOT analysis also serves as a diagnostic technique which helps in solving and strengthening the future projections and applications. Before, 1980's, this technique had been used in industrial management, but thereafter, it became an important exercise in all the fields of life. In the present scenario of agriculture, this technique can be an effective tool in understanding the emerging challenges of farming and different eco-systems and integrating them with requirements of agriculture in right perspective.

### **Major strengths**

- Suitable agro climatic conditions for food crops, sugarcane, sunflower, fruits & vegetables.
- District is strategically located & well connected to major cities.
- Efficient road & Railway Network.
- Dairy & Poultry are integral component of farming system
- Assured Price for rice and wheat
- Well developed infrastructure for marketing.
- Easy access to farm input.
- Liberal Scheme & easy availability of crop loan from NB & financial Institutions.
- Increasing adoption of mechanization
- A good network of extension services
- Farmers are very receptive
- Milk coop. societies at village level.
- Good communication facilities in villages
- Cooperative Sugar mill at Shahajadpur for cane growers.
- Active Participation of women in different enterprises.
- Milk processing plants provide ready market to milk producers.

- A hub for manufacturing of mixi, scientific instruments & seed processing accessories.

### **Major Weaknesses.**

- Over dependence on under ground water in the absence of canal water has put to dark zone.
- Small land holdings
- Rice-wheat cropping system leading to depletion of soil fertility & organic carbon.
- Intensive cultivation increases incidence of pests and diseases
- Poor management of cattle waste and farm residues.
- Discriminating Govt. policies towards oil seed & pulses.
- Non-adoption of IPM, INM, over dependence on pesticides
- Uneconomic holding size, Lack of diversification & inability of capital investment especially on horticultural crops.
- Poor breeding, feeding and management of livestock
- Soils are becoming deficient in micro nutrients
- Lack of water harvesting and management practices
- Lack of infrastructure facilities to avoid post harvest losses in fruits, vegetables and flowers.
- Rural under employment and due to lack of subsidiary enterprises.
- Diversion of cultivated lands towards urbanization.
- Poor literacy in farming community.
- Farm operations mainly dependent on migrant labourers .
- Poor drainage leads to silting of reservoirs & depletion of sand in agriculture land.

### **Major Opportunities :**

- Suitable agro climatic conditions congenial for horticultural crops.
- Agriculture wastes available in abundance which can be recycled to improve soil health and mushroom cultivation.

- Network of cooperatives.
- Good marketing infrastructure
- Better farming practices in capital & adjoining state.
- Integrating Horticulture & integrating live stock.
- Promotion of organic manure & compost.
- Good information and communication system
- Rail and road connectivity is good.
- Demand for milk and milk products and vegetables.
- Cooperative Sugar mill at Shajadpur
- Multiple land use

**Threats to the Farming System:**

- Herbicide resistance in wheat
- Maximum area under rice-wheat cropping system
- Very less area under horticulture, pulses and oilseed crops
- Indiscriminate use and over exploitation of underground water for irrigation
- Lack of recharging of underground water.
- Continuous and exhaustive rice-wheat cropping system led to loss of soil fertility.
- High residues of pesticides due to indiscriminate use
- Problem of blue bull & wild animals discourages farmers towards pulse cultivation.
- Live stock promotion was limited mostly to breed upgradation.

## **CHAPTER-IV**

### **DEVELOPMENT OF AGRICULTURE SECTOR**

#### **4.1 Introduction**

District Ambala has 4.8 %of the total State population which is around 1.014 million with compound annual growth rate of 2.3% per annum nearly 65% of the population resides in rural areas. Of the rural worker population main worker constitute 80% of the total rural workers population of which approximately 43% are agricultural labrores and cultivators and agriculture is the mainly back bone of the district. In Ambala District rice , wheat and Sugarcane are the dominating crops which account for 40% , 46% and 8% respectively of the total sown area. About 2% of the total sown area comes under fruit and vegetables. The productivity of the most of the crops in the district is slightly higher than the state average except in case of wheat and oilseeds. Pulses and oil seeds occupies a very small areas in the District. Live stock rearing has been and important component of farming system in the district . The main source of dairy products in the district is buffaloes.

#### **4.2 Land use :**

There is 133817 ha area under cultivation of different crops. The percentage of net area sown to total cultivable area is 96.2. Rice, wheat, sugarcane and sunflower are the major crops grown in the district. The area under different agricultural crops is given in Table. 1

**Table: 1 Area, Production and Yield of Major Crops in Irrigated/Rain fed Conditions during Kharif Season 2007-08.**

Crops	Block	Area (ha)					Production(q)					Yield(q/ha)		
		Irrigated	%	Rainfed	%	Total	Irrigated	%	Rainfed	%	Total	Irrigated	Rainfed	Average
Paddy	Ambala-I	25000	100	-	-	25000	88750	100	-	50	88750	3550	-	3550
Maize		200	54	200	50	400	453	50	453	50	906	-	2268	2268
S.Cane		1700	100	-	-	1700	11051	100	-	-	11051	6501	-	6501
Paddy	Ambala-II	16500	100	-	-	6500	23075	100	-	-	23075	3550	-	3550
Maize		-	-	100	100	100	-	-	226	-	-	-	2268	2268
S.Cane		1300	100	-	-	1300	8451	100	-	-	8451	6501	-	6501
Paddy	Saha	11200	100	-	-	11200	39760	39760	100	-	39760	3550	-	3550
Maize		-	-	300	100	300	-	-	680	100	680	-	2268	2268
S.Cane		2200	100	-	-	2200	14302	100	-	-	14302	6501	--	6501
Paddy	Barara	4200	100	-	-	14200	50410	100	-	-	50410	3550	-	3550
Maize		-	-	100	100	100	-	-	226	100	226	-	2268	2268
S.Cane		4000	100	-	-	4000	26004	100	-	-	26004	6501	-	6501
Paddy	Shahzadpur	8900	100	-	-	8900	31595	100	-	-	31595	3550	-	3550
Maize		-	-	700	100	700	-	-	1587	100	1587	-	2268	2268
S.Cane		2800	100	-	-	2800	18203	100	-	-	18202	6501	-	6501
Paddy	Naraingarh	9300	99	100	1	9400	33015	100	-	-	3315	-	2268	2268
Maize		-	-	1000	100	1000	-	-	1000	100	2668	3550	-	3550
S.Cane		3200	100	-	-	3200	20803	100	-	-	20803	-	2268	2268



### 4.3 Soil Health

The soil health of the district is of medium fertility. As per the soil health indices majority of the soil are low in available Nitrogen , Phosphorus , Organic Carbon and medium in available potash. Due to intensive cultivation micronutrient status of the soils are also depleting and reports of deficiency of iron, manganese and zinc have been reported.

### 4.4 Water Resource and management.

The area under irrigation (127350 ha.) to net sown (133000)ha. is 83.5% against the state average of 84.1%. Out of Total areas 111 thousand ha. through tube wells while only 14000ha. by canal. So the pressure on tubewells water increasing day by day and it is going to create a disastrous like situation for the firm sector of this district in near future. During the year 2006-2007 the availability of ground water reached upto depth of 220feet and up-liftment of water from this depth is a herculean task and also a very costly affair at the farmers level due to predominance of rice –wheat cropping system and dependence on under ground water for irrigation. The Brara and Sehjadpur block has been categorized as dark zone for ground water resource while rest of the block false under grey zone . There are 22160 tubewells and pumping sets in the districts to irrigate the land under agriculture . As per the observation of District hydroliogist the water table has gone down to 3 -5 feet in case of Shallow Tubewell while 10-15feet in case of deep tubewells every year (Table2)

**Table 2 Depletion of Under ground water status in Ambala District.**

Block	June 2006 (mt.)	Oct. 2006 (mt)	Fluctuation (Meter)
Ambala 1	4.94	3.63	1.31
Ambala -2	6.53	6.19	0.34
Brara	12.25	12.08	0.17
Saha	9.75	9.08	0.66
Nariangarh	11.35	10.73	0.62
Sahajapur	7.82	7.16	0.66
<b>Total</b>	<b>8.77</b>	<b>8.16</b>	<b>0.62</b>

#### **4.4.2 Scope for improvement in respect of irrigation**

There is need of awareness among the farmers for adopting water saving techniques as proposed in resource conservation earlier. The micro irrigation systems like drip and sprinkler irrigation should be popularized. Although a centrally sponsored scheme namely “National Micro Irrigation Project” has been implemented w.e.f. 1.4.2006 to promote micro-irrigation in the district. In order to recharge the ground water, rain water harvesting is necessary as there is about 1000 mm annual rainfall in the district. The focus should be on water saving techniques like irrigation at critical stages of crop growth, land leveling, green manuring and bed planting. These are ways to decreased conveyance losses by introducing folding plastic pipes, pucca channels and sub-surface pipe lines.

#### **4.5 Farm Mechanization :**

Farm mechanization has been helpful in improving productivity of different crops, time saving, reducing drudgery, timely farm operations, resource conservation and protection from natural calamities. The timely sowing of wheat due to zero tillage seed cum fertilizer drills has improved the productivity of wheat during the years 2006 to 2008 which is remarkable achievement in wheat production. Placement of fertilizers under drill sowing results in higher nutrient use efficiency and likewise higher irrigation efficiency under bed planting and laser leveling. Use of crop harvesting machines ensures early completion of harvesting and threshing works which escapes the untimely rainfall and storms hazards particularly in wheat, rice and potato crops. State department agriculture through govt. of India Macro Management Mode of Agriculture during the year 2004-07, the subsidy was provided for 317 zero drills, 208 rotavators, 52 potato planters, 19 potato diggers, 33 straw reapers, 1 reaper binders , 4 post hole diggers, 1 bed planter and 1 power tiller in district Ambala.

Apart from above there is need to create more awareness among farmers in respect of proper use of farm machinery for higher efficiency saving human and energy resources.

#### 4.6 Major crops and varieties in the district.

Rice, wheat, sugarcane, sunflower and forage crops (berseem and sorghum) are the major crops of the district. There is 100% area of wheat and 80% area of rice falls under high yielding hybrids (Table 3 & 4). Similarly, the area of sunflower is also 100% under high yielding private sector hybrids. The main hybrids of sunflower under cultivation are Mahyco-8, Mahyco-51, Jawala Mukhi, Divyamukhi, Pioneer 6460, Prosen-9 and NSFH-36. The varieties of sorghum also belongs to private sector and the lone variety of berseem grown in the distt. mascavi belong to public sector. The major varieties of sugarcane are COS 8436, COH-119, COS-767, COJ-64, CO-7717, COH 110, COH 92 and, COH-99.

**Table 3 : Spectrum of rice varieties and hybrids (H) grown by farmers in district Ambala**

Year	Dwarf varieties / hybrids
2007	HBC -19, CSR-30, PR 11-21, PUSA -44, PB-1, RH-10, HKR -47, H-71, H-6111, H-6129, H-6444, Sarbati and Shabnam.

**Table 4 : Spectrum of wheat varieties grown by farmers in district Ambala**

Years	Varieties
2005-06	PBW-343, WH-711, WH-542, HD-2329, HD-2687, HD-2733, WH-147
2006-07	PBW-343, PBW-502, PBW-373, WH-711, PBW -550, UP-2338 C -306, HD-2687, HD-2733, Raj-3765

#### 4.7 Input management

The major input used in different crops are seed, fertilizers and pesticides.

##### 4.7.1 Seed

The area under rice and wheat constitutes about 86 percent of total cultivable area. At present the seed replacement rate (SRR) of wheat and rice is 20 and 75 %, respectively. Thus, there is ample scope of SRR with regards to boost the productivity of major crops.

#### 4.7.2 Fertilizers

The adoption pattern of different nutrients (year 2007) in rice and wheat based on the survey conducted is given below in table 5 and 6

**Table 5: Crop wise NPK Consumption (Year 2006-07)**

S. No.	Block	Major crops	Fertilizer Consumption (kg/ha)			
			N	P	K	Total
1	2	3	4	5	6	7
1	Ambala-I	Paddy	450	150	150	750
		Wheat	522	150	157	829
		S. Cane	300	124	140	564
2	Ambala-II	Paddy	144	40	40	224
		Wheat	145	45	60	250
		S. Cane	93	32	34	159
3	Saha	Paddy	200	40	80	320
		Wheat	238	60	87	385
		S. Cane	159	53	56	268
4	Barara	Paddy	200	60	87	347
		Wheat	238	40	80	358
		S. Cane	159	53	56	268
5	Shahzadpur	Paddy	200	60	87	347
		Wheat	238	40	56	358
		S. Cane	159	53	57	268
6	Naraingarh	Paddy	200	60	80	347
		Wheat	238	40	87	358
		S. Cane	159	53	56	268

### **4.7.3 Pesticides**

The quantity of different pesticides (insecticides, fungicides and herbicides) used by farmers in different crops were 569 tonnes in the year 85-86 to 232 tones in the year 2003-2004

The insect pests and weeds are other major problems is achieving optimum yield for all major crops in the district. The strategy and methods employed by the farming community in the district revealed that the farmers are making groups negligence resulting increased cost of cultivation without corresponding increase in yield and quality. The farmers are blindly dependence on chemical control ignoring other management practices and strategies. Hence, urgent steps are required for the control of insect/Pest, Disease and weeds. The proposed plan for minimizing the pesticides has been proposed in the plan.

### **Special projects/programmes on going in the district**

The following special projects are on going in the district.

- a) Agriculture Technology Management Agency (ATMA) programme is being implemented since 2007-08 to strengthen the present extension system.
- b) Since 2004-05 the integrated scheme of oilseeds, pulses, & maize (ISOPOM) is being implemented in the district.
- c) Since 2006-07 the Macro management Mode of Agriculture is also being implemented to strengthen the mechanization in agriculture in the district.

## **4.9 Constraint Analysis :**

### **4.9.1 Yield gap analysis of major crops with reasons.**

The yield gap analysis of major field crops and enterprises was compiled by KVK resource team by identifying different farming situations with respect to ten progressive farmers under each AES in the district.

The data pertaining to yield gapes in majors crops of the district has shown in the

table 6. The main reasons of yield gape are resistance to herbicides, less , SRR (20)% , delayed sowing , application of poor quality water , low fertility and improper water management, Similarly in case of rice the yield gapes were due to low plant population per unit area, decreased water and nutrient use efficiency, less awareness about IPM , INM and IWM, Non adoption of eco-friendly mechanization , non availability of public sector hybrids leading to confusion among farmers regarding proliferation of private sector hybrids.

The major yield gaps in sugarcane were observed due to poor germination, non-availability of early varieties, poor seed replacement, poor management of ratoon and less adoption of IPM practices. Comparatively poor performance of sunflower was due to lack of quality seed of high yielding hybrids all belonging to private sector. Similar to rice, the farmers were at a loss to select sunflower hybrids due to non-occurrence of public sector hybrids. Non-application of sulphur fertilizers, wrong method of sowing (broadcast) and late sowing of sunflower coinciding the maturity of crop with onset of pre monsoon rains affecting the harvesting of sunflower.

The major constraint in spreading of pulses in the district is lack of competitiveness with rice and wheat in terms of net returns. Summer moong is gaining impetus in rice-wheat cropping system, there is need of high yielding short duration variety to fit in the rice-wheat system. Blue bull and wild animals problems though seriously hampering the percolation of pulses in the district .

#### **4.10.2 Research/Extension/Adoption gaps**

Varietal fatigue is the major research gap in all the crops. There is need of high yielding pests resistant varieties for replacement as a particular variety with the passage of time tends to loose its production potential and disease resistance. Hybrids of rice and sunflower need attention as the area under hybrids is tremendously increasing which is desirable even to improve productivity.

Due to limited human resource engaged in extension activities, the transfer of technology is not adequate as required there by there remains a gap in adoption of any new technology. The farmers are more in contact with commission agents and pesticide dealers

for credit, borrowing of inputs and technological know-how. There exists a parallel private extension system guiding the farmers about private sector input delivery system.

#### **4.10.3 Processing/Storage/Marketing gaps**

There is a good marketing network for disposal for farm outputs. The farmers are unable to keep the produce for storage due to their poor financial status and over dependent upon commission agents. Processing facilities of rice and sugarcane are available in the district and there seems to be no constraint in this case.

#### **4.10.4 Existing Institutional Mechanism in the Government sector**

As per above mentioned facts about the role of private sector in input supply, the supply of the input through institutional arrangement is not sufficient. The farmers are not sure about the quality of inputs supplied by private sector. The cooperatives role needs to be enhanced at village level to meet the input requirement .

#### **4.10.5 Income analysis of various categories of farmers**

The average annual income from agriculture per hectare of sown areas in Haryana is Rs. 41323 where as this figures comes to Rs. 43903 in case of Ambala District. As far as the state per capita income from agriculture in Rural areas at current prices is Rs. 9700 per annum. Where as it is Rs. 9000 from Ambala. Hence there lies significant scope for improvement in Ambala which still lies behind the state average. Though a systematic study on income of various categories of farmers is not available due to poor response of farmers in providing financial information for the fear of tax imposition, withdrawal of subsidies and credit facilities. Nevertheless, the majority of farmers are small and marginal having income for their subsistence. The farmers have low risk bearing capacity and investment.

Table 6 Sustainability issues and gap analysis of Productivity of different crops and resources. in District Ambala

Sr. no.	Gap	Existing problems	Possible solutions	Approach	Approximate area to be covered	Sustainability outputs
<b>A. Wheat</b>						
1.	Timely seeding of wheat	Delayed harvesting of basmati rice. Availability of irrigation, excess/untimely rains.	Zero tillage, short duration varieties of rice, reduced duration of basmati rice, direct seeding of basmati.	Research Extension and dev. Agencies should jointly approach in a farmer's participatory approach for each of possible solution. Testing of novel seeders in preparation for its commercialization e.g. happy seeders.	Out of 850000 ha. Area under wheat, 60 per cent area to be covered under timely sown conditions upto 10 <sup>th</sup> November.  Remaining areas under basmati rice and vegetable will be sown upto 1st week of December.	Zero-tillage will help: <ul style="list-style-type: none"> <li>a) Improving soil health including soil biology.</li> <li>b) Improved environment.</li> <li>c) Less water use</li> <li>d) More productivity</li> <li>e) Less problem of <i>P. minor</i> &amp; decreased use of herbicides</li> <li>f) Reduced cost of cultivation</li> <li>g) Facilitates sowing under high soil moisture conditions.</li> </ul>
2.	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 Univ. & the State Deptt. of Agril.	Efforts will be made to cover the entire area of wheat under seed treatment through special Campaigns with allied depts.	Productivity growth on sustainable basis
3.	Nutrient management through balance dose of fertilizer and bio-fertilizers	To encourage farmers for application need based fertilizers and micronutrients	Introduce more organic manures, more residue retention on surface, use of site specific micro nutrients. Management of pest disease and weed problems through more appropriate nutrient management.	Experimental research in different cropping systems, relook at soil test values, change in the recommendation of practice	-	The residue retention will help improving soil productivity, decreased losses of nutrients.



Sr. no.	Gap	Existing problems	Possible solutions	Approach	Approximate area to be covered	Sustainability outputs
4	Varietal improvement	No variety to tolerate terminal heat and frost injury. Short duration variety produces less yield	Varieties with stray green characters 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	At least 75 % area should be covered with varieties which can yield equal or more than WH-542 & PBW-343	More enhanced use of natural resources.
5.	Management of salinity and alkalinity	Decreased yield in the drought year because of life saving irrigations with brackish water in Kharif crops.	Avoid irrigation with brackish water because it leads to secondary salinity. Work is needed to adapt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability profitability and yield.	Long term expts. on salinity and sodicity build up will be undertaken in problematic areas.	Ambala-I, II, Sahzadpur & Barara block	Long term productivity of wheat will sustain by proper water management in the system as a whole
6.	Weed management	Phalaris minor seriously affects wheat yield in rice wheat cropping system	Improve the efficiency of existing herbicides Introduce new herbicide	Distt. level strategic plan for the mgt. of weed will be integrated	Entire District	Anticipated economic benefits are increased, profitability, increased yield and increased food security
7.	Production of value added wheat	Most of the available wheat varieties are poor chapatti making quality	To identify better quality wheat cultivars, to improve the quality through breeding programmes	Research will be under taken on these aspects	Experiment basis only in seed villages and on the fields of progressive farmers	-

Sr. no.	Gap	Existing problems	Possible solutions	Approach	Approximate area to be covered	Sustainability outputs
<b>B.</b>	<b>Rice</b>					
1.	Low plant density	Drudgery of transplanting operation, hired labour, non availability of labour	Introduction of paddy transplanter under zero tillage and direct seeding in unpuddled situations	Farmers participated approach or availability of paddy trans planter, custom hire services for raising nursery	Work will be undertaken in phases	Improvement in soil health conditions less water use and more economic
2.	Green manuring	Storage of summer moong and sesbania seed	Introduction of paddy transplanter under zero tillage and direct seeding in unpuddled situations	Farmers participated approach, KVK and farmers	Whole basmati area and 50 % coarse rice will be undertaken	-do-
3.	Decline in soil organic carbon	Coarse textured with high pH excess puddling, low moisture & high temperature	By introducing summer moong enhanced use of FYM, green manuring, promote 50 % area under basmati rice, use of leaf colour chart for slow release fertilizer	Long terms trials to study organic carbon status	Maximum area will brought	Improved organic contents
4	Decline water table	More area under summer rice, transplanting before the onset of monsoon continuous flooding, pan information and percolation of water	Avoid early transplanting and introduction of mechanical transplanting	Both type of research of farm at farmers fields are required	Entire district.	Improvement in water table.

Sr. no.	Gap	Existing problems	Possible solutions	Approach	Approximate area to be covered	Sustainability outputs
5	I P M	Heavy losses due to attack of diseases & insects	Seed treatment, timely sowing, selection of varieties, management of water, balance dose of fertilizer, clean cultivation and judicious use of pesticides	I P M campaign will be launched, seminar, camps, and goshies would be organized as well as demonstrations arranged	Organized in selected villages in phase	Less disease insect pest attack, more yield better quality, less environment pollution, low input cost sustainable land use & more benefits
<b>C. Diversification</b>						
1	Reduced biodiversity due to large area under mono culture without legumes	Highly risk crops, more disease pests or highly yielding varieties than those of pulses	Develop alternate strategy to introduce summer moong in the multiple land use system	Out source variety of moong, will suited in rice & wheat system	15 -20 percent area will be brought	Improvement in soil health & water use efficiency
2	Inter cropping of sugarcane & maize with other crops	Lack of mechanical crops establishment	Use of bed planter will facilities inter crop with vegetables	Farmer participatory approach	More area will be brought under autumn planting & inter cropping	Conservation of resources & more benefits with less costs
<b>D Water management</b>						
1.	Reduce water use efficiency	Poor rain and irrigation water management poor land leveling etc.	Shifting transplanting to mid June, Introduction of Zero tillage, bed planting, laser land leveling & manuring	Demonstration, devl. & research	Whole district.	Saving in water improved water efficiency & better water nutrients interaction
2.	Drainage congestion	Low lying area, excessive rain water, absence of water conservation measuring	Introduce surface or sub surface drainage device seedling techniques under relatively wet situation and dev. Varieties which can tolerate high moisture	Research on bio –tech. for developing varieties & more research on soil & water engineering	Water logged of Ambala 1 & 2	Better use of water and other natural resources

## Closing the gaps for realising the vision

### Activity output matrix

Issues	Programs	Activities	Collaborations	Cost
Seed production	<p>1. Seed planning</p> <p>2. Seed treatment</p>	<p>Participatory selection of improved variety at farmers field.</p> <p>2 motivating. Farmers to produce the seed of best variety</p> <p>3. Surveying the yield performance of varieties/hybrids in each crop.</p> <p>4. Presenting data of best performed variety.</p> <p>5. Deleting varieties/hybrids with low yields in any current season.</p> <p>6. Mandatory testing of new variety hybrids through KVK's.</p> <p>1 Chemical treatment and .non-chemical treatment</p> <p>2 Capacity building resource person/extension agencies/seed companies</p> <p>3 FARMERS</p>	<p>DDA's for serial no. 1 2, and 5</p> <p>KVK's for 3, 4.</p> <p>Data for all activities will be presented in the officers workshop</p> <p>DDA</p> <p>DDA/HSDC</p>	<ul style="list-style-type: none"> <li>• 50 ha *per year will be undertaken (50x5x5000=12,50,000).</li> <li>• Monitoring 50,000 per crop. (50,000x2x5=5,00,000)</li> </ul> <p>1158 lakh for Detail Table 18 &amp; 19</p>

Issues	Programs	Activities	Collaborations	Cost
2. RCT  (i) Zero-tillage	<p>Environmental (Carbon sequestration, soil fertility gains etc.) and economic benefits (saving in labor, diesel, machinery wear and tear etc) will be catalogued and calculated. Zero till technology will be extended to wheat in other cropping system and other crops including rice, sorghum, maize and pulses.</p> <ul style="list-style-type: none"> <li>❖ Assemble district level data and use them for bio-physical and socio – economic characterization using GIS.</li> <li>❖ Evaluate the concept for ecological intensification of cereal systems.</li> <li>❖ Improve agronomic efficiency of nutrients.</li> <li>❖ Improve recovery efficiency of nitrogen</li> <li>❖ Improve crop water productivity and irrigation water productivity for a system as a whole</li> <li>❖ Improve biological activity in the soil.</li> <li>❖ Reduce energy budget for rice-wheat cropping system.</li> </ul> <p>The rate of soil organic matter (increase and anticipated environmental benefit including improved soil fertility, soil structure and reduced leaching of N will be targeted)</p>	<p>Monitoring of farms where farmers have practiced zero-tillage for more than five years. (10 ha)</p> <p>KVKs &amp; Scientist from main campus/research station.</p> <p>KVKs &amp; Scientist from main campus/research station.</p> <p>DDAs &amp; KVK</p>	<p>KVK</p> <p>DDA</p> <p>Demonstration and long term trials will be laid out by KVKs at farmer’s field.</p> <p>DDAs will ensure visit of farmers at demonstration sites.</p>	<p>1600 lakh (Table 16, 17)</p> <p>Demonstration</p> <p>10x5x5000= 2.5 lacs</p> <p>Exposure visit = 2.5 lacs</p> <p>Zerotillage Machine 30 x 25000x5 = 37.5 Lakh 50% Subsidy of 37.5/2 = 18.75 (Table 25)</p>

Issues	Programs	Activities	Collaborations	Cost
(ii) Bed Planting	<ul style="list-style-type: none"> <li>❖ Technical and financial constraints will be studied to arrive at impediments that stand in the way of adoption of bed planting.</li> <li>❖ New scientific knowledge of its success in water log situation will be evaluated.</li> <li>❖ System level integration through multiple land use will be evaluated and accelerated to get full benefit from this technology.</li> <li>❖ This system will follow different pathways for system-level changes leading to ecological intensification through inter-cropping.</li> <li>❖ Will target, high yields, high profits and high resource efficiency (water, energy, nutrients, labour through improved management solutions).</li> <li>❖ Permanent raised bed system would be evaluated to arrest rate of ground water decline due to less use of ground water.</li> </ul> <p>Switching from rice-wheat cropping system to multiple land use system with sugarcane, vegetables, maize will be evaluated for their potential for less use of ground water.</p>	Dual purpose virtues of technology will be demonstrated in inter-cropping based system approach through University and State department.(10ha)	KVKs & DDAs	<p>Bed Planter</p> <p>50x50000= 25 lacs</p> <p>50 units with 50% subsidy on machines to be bought by the farmers.</p> <p>50x25000= 12.5 lacs</p>

Issues	Programs	Activities	Collaborations	Cost
(iii) Direct Seeding	Direct seeded rice, direct seeding by zero-tillage machine, direct seeding by drum seeder under wet situation. Green manuring immediately after wheat harvest, brown manuring by retaining residues and then seeding with machine, use of hybrids under direct seeded rice, decrease in maturity period, saving in water. Direct seeding will alleviate labour problem, will save water. The purpose of this sub-programme is to develop strengthen based and farmers driven direct seeded technology in basmati rice.	KVKs will lay out demonstrations on basmati rice. Demonstrations include direct seeding dry seeded and direct seeding wet seeded. Dry seeding will be done by machine while wet seeding will be done by drum. (4 ha)	DDAs and KVKs  Ten per cent area will be covered.	Demons 30x5x5000 = 7.5 Lacs (Table 26 & 8)
(iv) Alternate Wetting & Drying	Effect of switching from fluid to alternate wetting and drying method of irrigation for crop establishment on reduction in water use without effecting the productivity will be accessed.	DDAs will lay out demonstrations on coarse rice in each block. DDAs will also record data on water saving. The yield penalty if any will be recorded while recording data on yield.	HSDC/DDAs/HAFED/HL RDC  DDA/KVK	50x5x10000 = 25 Lacs (Table 8)
(v) Laser – Leveling	Laser land leveling for water saving, land saving and improve yields in rice, wheat and sugarcane.  The improvement in the productivity of crops	DDAs will organize and monitor the distribution of laser leveler specially on custom hire services. Data on water saving and yield will be recorded. The data will be discussed in joint meeting of KVK and DDAs. The presentation of data finalized in the meeting will be made by DDAs.	KVKs & DDAs will jointly lay out demonstrations in ten hectares	50x5x3000 = 7.5 Lacs (Table 8)

Issues	Programs	Activities	Collaborations	Cost
(vi) Green manuring	Improvement in the soil health.	DDAs will also ensure the exposure visit of farmers on sites already demonstrated by KVKs.	Agricultural Economist at KVKs or group of KVKs and concerned agronomist will prepare the data sheet on the profitability on different groups of varieties. Incentives on quantity of water saved or enhanced water productivity will be suggested.	50 units x 3.6 lac = 5.40 Lacs  540/2 = 270 lacs (50% subsidy) (Table 20)
(vii) Summer moong	To ensure timely transplanting of rice and to sustain the productivity of summer moong, the sowing should be preferred up to 20 <sup>th</sup> April.  1. To Protect the Environment  2 To Avoid the degradation of soil.  3. To Protect the beneficial flora and fauna.  4. To avoid loss of property and human life.	Two way subsidy may be given 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.  DDAs will ensure the timely availability of dhaincha seed at 75% subsidy. 50 per cent area will be covered during the plan period of five years.  DDAs and KVKs	DDAs will demonstrate and KVKs will collect yield data on successful demonstrations.	Demonstration  20 ha x 5x5000=5 lacs  (Table 8)



<p>viii) Avoid Stubbles</p> <p>Burning</p>	<ul style="list-style-type: none"> <li>➤ Deficit irrigation increase water use efficiency.</li>   <li>➤ Keeping 40-50 per cent area under basmati rice.</li>   <li>➤ Testing of high yielding basmati varieties.</li>             <li>➤ Salinity/sodicity stress mitigation at farmers' fields</li> </ul>	<p>DDAs will ensure the acceleration of the technology and timely availability of treated seed. The suitability of variety to be ensured through KVKs.</p> <p>Seed producing farmers may also be given incentives. Farmers producing summer moong for commercial purpose may be given incentive in the form of MSP and guaranteed procurement.</p> <p>Farmers Community will be educated through holding seminars/lecturers/gosthis etc.</p> <p>Deficit irrigation for 15 days in July or August will be tested for coarse rice.</p> <p>Economics of basmati rice in favour of farmers will be ensured through technological interventions and policy frame work.</p>	<p>D.D.A.</p> <p>D.D.A. &amp; K.V.K.</p> <p>D.D.A. &amp; K.V.K.</p> <p>KVKs &amp; DDAs will jointly lay out demonstrations in ten Hectares</p> <p>-----</p> <p>-----</p>	<p>Please See Table 23</p>       <p>Please See Table 24</p>  <p>20x5000x5= 5.0 lacs</p> <p>Table 9</p>
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<p><b>3. Water management (Depleting and rising water table)</b></p>	<ul style="list-style-type: none"> <li>➤ Water logging and secondary salinization</li> <li>➤ Water harvesting and recharging</li> <li>➤ Watershed development in rainfed areas</li> <li>➤ Utilization of brackish water.</li> </ul>	<p>Varieties for traditional basmati for yield improvement. The price incentive of a multiple of 1.6 for traditional basmati and 0.6 for coarse rice compared to prevailing price of evolved basmati rice in the region.</p> <p>Green manuring and gypsum use. Tolerant varieties.</p> <p>Bio-drainage through tree plantation.</p> <p>Construction of water harvesting structures.</p> <p>Sprinkler/drip irrigation after creating facility of community ponds.</p> <p>Alternate/conjunctive use of water.</p>	<p>Subsidy on gypsum and its availability will be ensured. Tolerant varieties like CSR-30 will be evaluated with other candidate varieties.</p> <p>ASCO and DDAs will ensure the characterization of water logged areas and plantation of useful tree species.</p> <p>DDAs/concerned departments in consultation with KVKs</p> <p>DDAs/concerned departments in consultation with KVKs</p> <p>DDAs/concerned</p>	<p>2 lacs x 5 = 10 lacs for survey</p> <p>40x1000x5 = 20 lacs Table 10</p>
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<p>4. Site specific nutrient management</p>	<p>➤ Ground water testing for nitrate and sulphate contamination.</p> <p>Number of split application and timing of top dress N with reference to irrigation</p> <p>Bio-fertilizers</p>	<p>Survey of marked sites for nitrate and sulphate contamination</p> <p>Characterisation of nitrate and sulphate contaminated areas.</p> <p>The project will identify, test and promote intervention for the sustainable rice-wheat cropping system through site specific nutrient management.</p> <p>Fertilizer recommendation will be based on the principles of SSNM. SSNM will include yield gap analysis, guidelines for regional protocol.</p>	<p>departments in consultation with KVKs</p> <p>State level designated lab at Karnal may be strengthened . Another lab may be established at Rewari. (DDAs)</p> <p>Special provisions need to be made for creating regional level designated labs for quantifying micro-nutrients deficiencies. (DDAs)</p> <p>Existing fertilizer use will be quantified on the basis of farmer’s field survey. The ratio of NPK and quantity of each components currently use by farmers will be compared with recommended practices at farmer’s field. The data will be presented in officer’s workshop for further research and/or recommendation. (DDAs)</p>	<p>20x 5000x5 = 5 lacs</p> <p>(Table 10)</p>
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5. IPM	<p>Management of bakane disease (Foot rot disease) through nursery management.</p> <p>Management of Sheath blight through clean cultivation.</p> <p>Management of blast in basmati rice</p> <p>Management of false smut in paddy</p> <p>Management of leaf folder, stem borer and white backed plant hopper (WBPH)</p>	<p>Integrated soil and crop management for rehabilitation of pulse production in rice-wheat cropping system.</p> <p>Surface residue management for improving soil health.</p> <p>Improving the efficiency of nutrient utilization.</p>	<p>DDAs will ensure quality seed of important pulses for Kharif and Rabi seasons. The university will ensure recommendation of varieties tolerant to various types of biotic and abiotic stresses.</p> <p>Happy seeders and other machineries for uniform distribution of residue will be ensured by DDAs.</p> <p>Residue retention machinery, second generation machinery, precision and no-till farming for crops and cropping system.</p>	<p>20x5000x5=5lakh</p> <p>Table 10</p>
6 IWM	<p>Biological control of pests in sugarcane.</p> <p>Agronomic management of borers in sugarcane.</p>	<p>DDAs will demonstrate the recommended technologies at farmers field</p> <p>DDAs will organize farmer's field schools.</p> <p>KVKs will suggest tolerant varieties.</p> <p>By adjustment of planting dates</p> <p>-----Do-----</p>	<p>DDAs</p> <p>KVKs</p> <p>DDAs</p> <p>KVKs and research scientists</p>	<p>Farm machinery</p> <p>50 lacs</p> <p>Demonstration</p>

7. Timely seeding of wheat		Strengthening of bio-control lab.	KVKs DDAs DDAs/KVKs	10 ha x 5x 5000 = 2.5 lac (Table 22)
	Quantification, characterization and management of resistance of key pests against insecticides in vegetables.	Strengthening of quality of pesticide lab of state department.	DDAs/KVKs	
	Diversification of wheat varieties against rusts.	Demonstration of candidate varieties at farmer's field.	DDAs	10000 ha x 250x5 = 125 lacs
	Management of wheat aphids	Survey & demonstrations Demonstrations Survey and demonstrations	DDAs/KVKs	10 field's schools x 5 x50000 = 25 lacs. 50 lacs
	Spraying techniques for improving efficiency of herbicides.	Research, extension and development agencies should jointly approach in a farmers' participatory approach for each of possible solution. Evaluating and refining the technology for a range of stubbles, developing guidelines for achieving good establishment with residue retention, efficient use of N fertilizer.		Please See in Table 11
	Monitoring of herbicide resistance.			10ha x5x5000= 2.5 lacs

	<p>Delayed harvesting of Basmati rice, availability of irrigation, excess/untimely rains</p> <p>Zero tillage, short duration varieties of rice, reduced duration of Basmati rice, direct seeding of Basmati, regulation of canal irrigation water supply</p>	<p>The technology meet to be further developed for other cropping systems and other crops.</p> <p>Testing of novel seeders in preparation for its commercialization e.g. Happy seeders.</p>		<p>50000x5= 2.5 lacs</p> <p>50000x5=2.5 lacs</p> <p>50 ha x 5x5000 = 12.5 lac</p> <p>50000x5= 2.5 lacs for surveys</p> <p>10hax5x5000 = 2.5 lacs</p> <p>For demonstrations</p> <p>Table 13</p>
8. Rice	<p>Introduction of hybrid for both coarse and basmati rice.</p> <p>Fertilizer management in hybrid to avoid lodging and incidence of pest and diseases</p> <p>Mechanical transplanting to avoid labor problem</p>	<p>DDA's KVK's and concerned scientists from research will help in accelerating the adoption of hybrids or competing varieties of coarse rice and basmati. Revise the recommendation of fertilizer use for achieving target yields.</p> <p>Accelerated adoption of paddy transplanted and direct-seeds rice.</p>	<p>DDA's and KVK's will jointly demonstrate the virtues of new technologies under the leadership of KVK scientists.</p> <p>Linkage and synergies with private sector will be developed for outsourcing hybrid seeds and/or developing MOU for seed</p>	<p>20 ha x 5x5000 = 50 Lacs</p> <p>20 has x 5000x5= 50 Lacs</p> <p>50 hax 10000x5 = 25 Lacs (Direct Seeded rice) Table 8)</p>

		DDA's will facilities demonstrations on six nice areas proposed in coloumn2	production by securing parent lines.	10 Paddy transplatner = 20 Lac.  50000x5 =2.5 Lac for survey and monitoring (Table 13)
9. Sugarcane	Late planting after wheat harvesting, lacs of mechanized planting, lacs of varieties in early group  Less use of potash	DDAs will facilitate autumn planting of whole sugarcane area planted after wheat harvesting facilitate intercropping of Rabi crops with autumn sugarcane using baed planting, testing of early varieties through KVKs and sugarmil	DDAs cane commissioner, sugar mills and KVKss	20 ha x 20000 x 5 = 20 Lacs  50% subsidy on bed planter 50x25000 = 12.5 lacs (Table 14, 26)
10. Other crops sun-Flower	Quality seeds of sunflower hybrid	Linkages and synergies with private sector will be developed for availability of hybrid seed of sunflower	DDAs will ensure the available of quality seeds of sunflower hybrid	20 ha x 5000x5 = 5 Lacs. Table 15

#### **4.11 Recommended interventions for the district with detailed action Plan with costs.**

As discussed in table. 6 (yield gap analysis) the following interventions are required to bridge the technological gaps for enhanced productivity.

##### **4.11.1 Varietal improvement:**

To increase the productivity of rice and sunflower, the testing of different hybrids is essential to develop the suitable package of practices for further dissemination. For this purpose trainings and demonstrations will be conducted at farmers fields. This will include the linkages and synergies with the public sector private sector, NGO's cooperatives. The technology will be outsourced wherever needed.

##### **4.11.2 Resource Conservation Technology**

Agriculture is entering a new transformation phase to ensure that past gains of conventional technology can be sustained and further, enhanced to feed the growing population. Productivity stagnation, deteriorating soil health and depleting water resources are the present day concerns of attention. Conservation agriculture has come up a new paradigm to maintain ecological equilibrium for cost effective regenerative processes like no-tillage, water and energy saving, nutrient recycling, soil regeneration and protection of natural enemies of pest and diseases. Such resource conservation technologies (RCTs) have proved boon to the farmers practiced in the district through farmers participatory approach.

##### **(B) Laser levelers for land leveling :**

The water table in the district is going downward approximately 30 cm every year. The farmers participatory research has shown that use of laser leveler saves 25-30% water, increases grain yield by 15-20%, increase in area by 3-5% alongwith others invisible advantages. Thus this technology needs popularization.

##### **(C) Bed planting**

Sowing of wheat with bed planter exhibits yield advantage and 21-24% higher water



use efficiency. Thus the scarce available water can be efficiently converted into enhanced output. There are only one bed planters associated with public sector which is are not sufficient even to demonstrate the technology.

**(D) Green manuring with sesbania:**

The organic matter status of soil is decreasing and atleast 0.4 per cent organic matter must be maintained to harvest good crop yields. Therefore, recycling of biological matter is of utmost importance and green manuring during summer in rice-wheat cropping system needs to be popularized.

**(E) Bringing more area under summer moongbean:**

Ground water resource is continuously depleting in Brara and Shajadpur Block that has been declared as dark zone. Mungbean will provide value addition to rice-wheat cropping system. Further the productivity of rice improves grown after moongbean.

**4.12 Projected outcome and growth rate during the plan period:**

The projected outcome of the proposed interventions given at Sr. No. 4.11 can be assessed by the logical framework matrix (LFM) .

**4.13 Research Issues**

- (i) Development of varieties and hybrids of different crops.
- (ii) Strong linkages and synergies with private sector for hybrid development including outsourcing.
- (iii) Technology for recharging of under ground water resource.
- (iv) Suitable strategies for IPM.
- (v) Herbicide resistance in wheat.

**4.14 Integrated pest management (IPM)**

The insect, disease and weeds spectra are becoming wide over the years due to spread

of non-recommended private sector crop hybrids prone to various biotic stress. Secondly, the indiscriminate use of non branded pesticides are creating the multifarious problems like resistance development against pests and environmental as well as ecological hazards. These issues needs to be addressed through IPM strategies to reduce the pesticide load on crops.

#### **4.15 Integrated nutrient management (INM)**

The soil health is towards a declining trend ultimately affecting the productivity of different crops. The status of organic carbon, phosphorus, potassium, zinc and sulfur indicates the imbalances of nutrients which need to be replenished for this purpose. Integrated nutrient management is essential to harvest production potentials of different crops.

**Table 7 Proposal for Seed Planning**

Description	2007-08	2008-2009	2009-2010	2010-2011	2011-20012	Total
50 Demons @ Rs. 5000 per demons	2.5	2.5	2.5	2.5	2.5	12.5
Monitoring 2 Crops @ Rs. 50,000	1.0	1.0	1.0	1.0	1.0	5.00

**TABLE 8 PROPOSAL OR DEMONS ON R.C.T.**

Description	2007-08	2008-2009	2009-2010	2010-2011	2011-20012	Total
Demons Trial of Zero tillage in 20 Ha @ Rs. 5000 per ha.	1.0	1.0	1.0	1.0	1.0	5.00
Exposure Visit	1.0	1.0	1.0	1.0	1.0	5.00
Demons on Bed Planting 30 ha @ Rs. 5000	1.5	1.5	1.5	1.5	1.5	7.50
50 Demons on Direct Seeded @ of Rs. 10000 per Ha	5.0	5.0	5.0	5.0	5.0	25.00
50 Demons on Alternate wetting and drying @ Rs. 3000/ Demons	1.5	1.5	1.5	1.5	1.5	7.50
20 Demons Laser leveling @ Rs. 5000 Per Ha.	1.0	1.0	1.0	1.0	1.0	5.00
Total Rs. In Lac	10.5	10.5	10.5	10.5	10.5	55.00

**Table 9 PROPOSAL FOR WATER MANAGEMENT DEMONS**

Description	2007-08	2008-2009	2009-2010	2010-2011	2011-20012	Total
20 Demons of Deficit Irrigation, use of problematic water, by drainages @ Rs. 5000 per Demons	1.0	1.0	1.0	1.0	1.0	5.00

**Table 10 PROPOSAL for SSNM**

40 Demons on SSNM @ Rs. 10000 per Demons	4.0	4.0	4.0	4.	4.0	20.00
20 Demons on bioFertilizer @ Rs. 5000 per Demons	1.0	1.0	1.0	1.0	1.0	5.00

**Table 11 PROPOSAL for IWM**

20 Demons on Spraying techniques @ Rs. 5000 per demons	1.0	1.0	1.0	1.0	1.0	5.00
4000 Spray Booms for each year @ Rs. 250/- .	10.0	10.0	10.0	10.0	10.0	50.00
Survey & Demons on herbicide resistance	1.0	1.0	1.0	1.0	1.0	5.00

**Table 12 PROPOSAL for Extension activities on timely spraying of Wheat**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Campaign, Camp Hoarding posters, gothis & Field days etc.	5.0	5.0	5.0	5.0	5.0	25.00

**Table 13 PROPOSAL for Demons on hybrid rice and transplanter**

20 Demons on hybrid rice @ Rs. 5000 per Demons	1.0	1.0	1.0	1.0	1.0	5.00
20 Demons on Mechanical Transplanter @ Rs. 5000 per Ha	1.0	1.0	1.0	1.0	1.0	5.00
Two Paddy Transplanter @ Rs. 2 Lac per Paddy Transplanter	4.0	4.0	4.0	4.0	4.0	20.00

**Table 14 PROPOSAL for Demons on SugarCane**

20 Demons on Planting Techniques @ Rs. 20000 per Demons	4.0	4.0	4.0	4.0	4.0	20.00
20 Demons on Nutrient management @ Rs. 20000 Per Demons	4.0	4.0	4.0	4.0	4.0	20.00
Survey of Insect Pest and biological control	2.0	2.0	2.0	2.0	2.0	10.00

**Table 15 PROPOSAL for Demons on Sun flower**

20 Demons on hybrid sunflower popularization @ Rs. 5000 per Demons	1.0	1.0	1.0	1.0	1.0	5.00
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**Table 16 Seed and Seed treatment chemical requirement**

Crop	Area Ha	Seed Requirement Tonnes)	Chemical Required for seed treatment (Kg/Ltr.)
Wheat	85000	8500	Raxil 8500 Kg.
Paddy	72000	720	Emisan 1800 Kg. Streptocycline 180 Kg.
Sugar cane	15000	1350	Emisan 22000 Kg. Chloropyriphos – 75000 Ltr.

**Table 17 PROPOSAL for Seed Treatment (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Paddy	10.0	10.0	10.0	10.0	10.0	50.00
Wheat	90.0	90.0	90.0	90.0	90.0	450.00
Sugger Cane	220.0	220.0	220.0	220.0	220.0	1100.00

**Table 18 PROPOSAL for Seed Replacement Strategy**

Crop	Area	Requirement in 2007-2008	Replacement Ratio (%)	Requirement as per R.R. 2008-2009	2009-2010	2010-2011	2011-2012
Wheat	85000 Ha	85000	8500 (10%)	17000 (20%)	25500 (30%)	34000 (40%)	42500 (50%)
Paddy	72000 Ha	72000	7200 (10%)	14400 (20%)	21600 (30%)	28800 (40%)	36000 (50%)
Sugar Cane	15000 Ha	15000	1500 (10%)	3000(20%)	4500(30%)(	6000 (40%)	7500(50%)

**Table 19 PROPOSAL for Seed Replacement in wheat & paddy (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Seed Replacement wheat (Qt)	8500	17000	25500	34000	42500	127500
Subsidy @ 25% of seed cost @ Rs. 1600/ Qt	34.0	68.0	102.0	136.0	170.0	510.00
Seed Replacement paddy	7200	14400	21600	28800	36000	108000
Subsidy @ 25% of seed cost @ 2400/qt	43.2	86.4	129.6	172.8	216.0	648.00

**Table 20 PROPOSAL for Land Levelling through laser leveler (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Machine required (No)	50	40	30	20	10	150
Present Cost @ Rs. 3.6 Lacs per machine	180	144	108	72	36	540
Subsidy @ 50% per leveller	90	72	54	36	18	270

**Table 21 Proposal for INM demons**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Cerels	20	30	40	50	60	200
Cost demons @ Rs. 5000 each	1.0	1.5	2.0	2.5	3.0	10.00
Sugar Cane	10	15	20	25	30	100
Cost Demons @ Rs. 10000 per Demons	1.0	1.5	2.0	2.5	3.0	10.00
Vegetable crops demons	20	25	30	35	50	150
Cost Demons @ Rs. 5000 per demons	1.0	1.25	1.50	1.75	2.5	8.0

**Table 22 Proposal for IPM Demons**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Paddy	20	30	40	50	60	200
Cost Demons @ Rs. 5000 Per Demons	1.0	1.5	2.0	2.5	3.0	10.00
Sugar Cane	10	20	30	40	50	150.00
Cost Demons @ Rs. 10000 per Demons	1.0	2.0	3.0	4.0	5.0	15.00
10 Field School @ Rs. 50000 per schools	5.0	5.0	5.0	5.0	5.0	25.00
Establishment of Plant clinical lab at KVK	--	5.0				5.00



**Table 23 Proposal for Green manuring through Dhaincha**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Area Per Ha	7000	10000	13000	15000	25000	70000
Seed Requirement @ Rs. 30 Kg. Per Ha (Qt)	2100	3000	3900	4500	7500	21000
Financial Assistance Required @ Rs. 1500 per Qt.	31.5	45.0	58.5	67.5	112.5	315.00

**Table 24 Proposal for Summer Moong**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Area Ha	500	1000	2000	2500	3000	9000.00
Seed Required @ 25 Kg. Per Ha (QT)	12.5	25.0	50.0	62.5	75.0	225.00
Cost of Seed @ Rs. 500 per Qt. (Lacs)	12.50	25.0	50.0	62.50	75.0	225.0
Subsidy Required @ 50%	6.25	12.5	25.0	31.25	37.5	112.5

**Table 25 Proposal for Zero Tillage Machine (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
No. of Zero Tillage Required	30	30	30	30	30	150.00
Cost @ of Rs. 25000	7.5	7.5	7.5	7.5	7.5	37.5
Subsidy @ 50%	3.75	3.75	3.75	3.75	3.75	18.75

**Table 26 Proposal for Bed Planter (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
No. of Bed Planter Required	10.0	10.0	10.0	10.0	10.0	50.00
Cost @ Rs. 50000 Per Planter	5.0	5.0	5.0	5.0	5.0	25.00
Subsidy Required @ 50%	2.5	2.5	2.5	2.5	2.5	12.5
30 Demons on Bed Planting @ Rs. 5000 per Demons	1.5	1.5	1.5	1.5	1.5	7.5

**Table 27 Proposal for Capacity Building of Agriculture Staff (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Training of Agriculture Staff (No)	10.0	10.0	10.0	10.0	10.0	50.00
No. of Trainees 25 per Training	250	250	250	250	250	1250
Cost per training @ Rs. 600 per training per day	1.5	1.5	1.5	1.5	1.5	7.5

**Table 28 Proposal for Capacity building of Agriculture farmer (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Training of Farmer (No)	30.0	30.0	30.0	30.0	30.0	150.00
No of Trainees 30 per training	900	900	900	900	900	4500
Cost of Training @ of Rs. 400 per farmer per day	3.6	3.6	3.6	3.6	3.6	18.0

**Table 45. Projected Out Come and growth rate during the Plan Period (Horticulture & Veggies) (Area - ha, Production – Q/ ha, Productivity --- Q/Ha.)**

Sr. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08(Projected)			2008-09(Projected)			2009- 10 (Projected)			2010-11 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1.	Mango	1012	9614	95	1000	9880	98.8	1050	10762	102.5	1060	11342	107	1080	12096	112
2.	Guava	77	770	100	75	780	104	80	864	108	80	896	112	85	994	117
3.	Sapota	46	322	70	50	365	75	50	380	76	55	434	79	55	451	82
4.	litchi	7	581	83	5	430	86	05	445	89	5	460	92	5	475	95
5.	Peach	40	475	125	45	585	130	45	607	135	15	700	140	50	725	145
6.	Pear	31	532	190	30	591	127	25	512	205	25	532	213	20	444	222
7.	Plums	26	427	178	25	462	185	20	384	192	22	440	200	25	520	208
	Total	1350	12850	841	1230	1393	803.8	1275	13954	907.5	1297	14804	943	1320	15705	981
	Vegetable crops															
1.	Potato	235	52150	190	2850	56145	197	2900	59450	205	2900	61770	213	2950	65490	222
2.	Onion	1507	27126	180	1550	29158	188	1550	30225	195	1600	32480	203	1600	33920	212
3..	Tomato	1505	11035	80	1550	12865	83	1500	12900	86	150	13950	90	1500	13950	93
4.	Radish	1355	24222	180	1400	26320	188	1400	27300	195	1300	26390	203	1300	27456	2112
5.	Carrot	2620	25280	100	2650	27560	104	2650	28620	108	2700	30240	112	2700	31590	117
6.	Chillies	940	8192	80	900	7470	83	900	7740	86	850	7650	90	850	7905	93
7.	Cauliflower	1735	31385	180	1750	32900	188	1750	34125	795	1800	36540	20.3	1800	38160	212
8.	bhindi	2165	12255	60	2100	13125	62.5	2100	13650	65	2120	14416	68	2120	15052	71
9.	Brinjal	1485	24760	160	1450	24142	166.5	1450	25085	173	1400	25200	180	1400	25900	185
10.	Leafy vegs	2240	14847	90	2000	18800	94	2000	19600	98	1800	1810	101	1800	18900	105
11.	Cucurbits	3550	23085	70	3550	25915	73	3550	26980	76	3600	28440	79	3600	29520	82
	Total	25910	276682	1350	21750	274400	1427	21750	285675	1482	22620	364108	1542	21620	307843	3504

## CHAPTER-V

### Allied agriculture Sectors

Horticulture, Animal Husbandry, Fisheries and Social Forestry are the allied sectors important in district development of agriculture.

#### 5.1 Horticulture Development

Horticultural has been identified as potential , agricultural enterprise which provides option for diversification, enhanced revenues and forward linkages for value addition. The agro climatic conditions of the district are very much congenial for growing fruit and vegetable crops. The major fruit crops grown in the district comprising mango, guava, peach, pear, chiku and citrus produced 12850 tonnes (2006-07) from an area of 1350ha. The major vegetable crops viz. potato, tomato, carrot, cauliflower, radish, onion, pea, chillies, brinjal, cucurbits and leafy vegetables in 25910ha produced 276662tonnes (2007-08). Besides this, spices grown in 449 ha had a production of 2441 tonnes. Floriculture in 100 ha with the production 330 tonnes of loose flowers and 1.8 lacs sticks of gladiolus. Mushroom is also an important enterprise grown as 25000 trays with the production of 120 tonnes. The data on present status of horticultural crops are given in Table 26, 53, 54, 55 and 56. National Horticulture Mission is being implemented from the year 2004-05 in district Ambala.

**Table: 30 Area, Production and Yield of Major Horticulture Crops.**

S.No.	Block	Crop	Irrigated	%	Rainfed	%	Total	Irrigated	%	Rainfed	%	Total	Irrigated	Rainfed	Average
1	Ambala-I	1. Mango 2. Guava 3. Chiku	130	10	65	22	195	850	10	380	22	1230	6.0	5.8	5.9
2	Ambala-II	Mango 2. Guava 3. Chiku	174	13	35	12	209	1139	13	204	12	1343	6.5	5.8	6.15
3	Saha	Mango 2. Guava 3. Chiku	180	14	30	10	210	1180	14	285	16	1465	6.5	9.5	8.0
4	Barara	Mango 2. Guava 3. Chiku	260	20	60	20	320	1705	20	340	20	2045	6.5	5.6	6.05
5	Shahzadpur	Mango 2. Guava 3. Chiku	385	29	55	19	440	2520	30	300	17	2820	6.5	5.4	5.95
6	Naraingarh	Mango 2. Guava 3. Chiku	170	14	50	17	220	1119	13	218	13	1337	6.5	4.35	5.42

**Table: 31 Area Expansion Plan of Horticulture Crops(Including vegetable crops)  
(Area in ha)**

Existing Cropping Pattern(2006-07)		2007-08	2008-09	2009-10	2010-11	2011-12
Crops	Area	Area	Area	Area	Area	Area
Fruit Crop	168	75	80	80	75	75
Mango, Guava, Chiku						
Vegetable Crop	2835	2875	2890	2890	2900	2900
Potato						
Pea	1155	1200	1200	1210	1220	1230
Tomato	1505	1300	1350	1360	1360	1400
Carrot	2620	1510	1700	1800	1800	1900
Cucur Bits	2240	3359	3370	3370	3400	3500

**Table 32: Rejuvenation Plan of Horticulture Crops  
(Area in ha)**

Area brought under Rejuvenation(2006-07)		2007-08	2008-09	2009-10	2010-11	2011-12
Crops	Area	Area	Area	Area	Area	Area
Mango	40	-	10	10	5	5
Guava	05	-	-	-	-	-

**Table 33 Mushroom information 2007-08, District Ambala**

S.No.	Block	No. of units	Area under Mushroom (Trays)	Average Mushroom Production(Trays)			GAP in yield(Trays)		Reasons for GAP in yield
				District	State	FLDs	District level	State level	
1	Ambala I & II	4	2200	12.8 Kg./Trays	-	-NA-	Nil	Nil	-
2	Barara	6	2500	12.8 Kg./Trays	-	-NA-	-	-	-
3	N./garh	2	2300	12.8 Kg./Trays	-	-NA-	-	-	-

**Table: 34 Proposed Physical and Financial Targets Mushroom for XI Plan**

Name of Activity	Unit Cost (Rs.)	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Mushroom Cultivation Size 14'X10'X9	50500	”	555500	10	50500	10	505000	10	505000	10	505000	10	505000

**Table 35: For Bee keeping**

**Table 36: For Floriculture:** No. Scope in Ambala Distt.

Sustainability issues and gap analysis of Productivity of different allied sectors.

**Table 36**

1. Vegetable production	Non-availability of high Quality/ Hybrid seeds	<p>Public/private linkage and synergies either through direct testing of existing hybrid seeds of private sector or collaborating with private sector for development of hybrid seeds at the university farm</p> <p>Injurious use of pesticides and the use of contaminated ground water or sewage/canal.</p> <p>Survey of current status of pesticides uses on vegetables for recommended or unrecompensed</p>	<p>DHO and University</p> <p>Regulations regarding disposal of industrial waste</p> <p>DHO may collect random samples and outsource the residue analysis alternate arrangement.</p>	40 ha x5x10000 = 20 Lacs (Table 39)
2. Fruit Crops	Provision of nutritional gardens near/around tube wells	DHO will ensure the distribution of five grafted plants to farmers for plantation on or around the tubewells. Only one species may be given for each location to facilitate watch and ward	DHO	40x50000x5 = 10 Lacs Table 39
3. Farming system through dairy	Given in chapter 5 Animal husbandry (5.3)	Given in Chapter 5 (5.3.3)	DDAH and KVK	Please See Table No. 27
4. Improving milk	Reduction of calving period-by adopting mineral mixture	Private public linkage and synergies be created. Retails outlets may also		



productivity	feeding and balanced feeding, deforming, summer management, unestrus management, free hormone therapy for repeat breeder of resource poor.	be associated with productivity improvement through A.I. and natural services.  DDAHs and KVKs		
5. Disease management in diary animals	Diagnostic kits for diseases, vaccination as regular feature, survey and surveillance of diseases and creation of drug banks for common ailments.	DDAHs and disease diagnostic labs to formulate common strategies for disease forecasting and management.		
6. Fisheries	Water resources for fisheries, fish seed, education	Renovation of ponds strengthening of fish seed farm, fisheries trainings.	DDF	Financial/cost factor See Table 38
7. Bee-Keeping	Bee-colonies, honey extracting, education	Supply of bee colonies, honey extracting and processing, monitoring and education	DHO and KVK	Please see Table 42
8. Mushroom Farming	Unit Establishment	Training and Monitoring	DHO and KVK	Please see Table 43
9 Vermi-Composting	Unit establishment, earth	Construction of units.	DHO,DDA and KVK	Please See Table 44

### **5.1.1 Constraints analysis in Horticulture**

#### **a) Productivity gap**

Lack of good quality planting material for propagation of fruit plants and non availability of varieties and hybrids from public sector, in adequate extension services , poor management, poor marketing infrastructure, fluctuating market prices, lack of post harvest management technology and export facilities and obviously natural calamities are some of the major constraints faced by farmers for fruits, vegetables and floriculture.

Potato is the major vegetable crop facing very low seed replacement rate (below 10%) which is in turn encouraging the spread of seed born diseases resulting in low productivity.

#### **(b) Research/Extension/Adoption gap :**

Lack of improved high yielding disease resistant varieties of vegetable crops namely potato, onion, tomato , chillies and pea. There is scarce human resource for extension of horticultural crops. And due to which hindrances in transfer of technology in toto to the horticultural farmers.

#### **(c) Processing/storage/Marketing gaps :**

Fruits and vegetables are highly perishable which cannot be kept for a longer time without the processing and storage facilities. Such facilities are not sufficient in private and public sector. Lack of multichamber cold storage facilities for vegetables and fruits in the district leads to immediate disposal of produce at low prices. There is also a wide gap between producers and consumers prices of vegetables and fruits and there by middleman enjoys more profits.

#### **(d) Existing Institutional Mechanisms**

Though there is Department of Horticulture engaged in extension of horticulture technology,yet private sector cold storages, regulated markets are available in towns for

disposal of produce. Even though There is need of strengthening the existing system to boost the horticultural sector in the district.

### **5.1.2 Interventions recommended for the distt. and proposals for XI plan**

- a) Availability of good quality Saplings .
- b) Seed replacement and major corps.
- c) Demonstrations and trainings to bridge the adoption gaps.
- d) Awareness regarding proper fertilization.
- e) Propagation of micro irrigation system required in horticulture crops.
- e) IPM and INM in horticulture crops.
- f) Need to encourage income generating enterprises like mushroom, bee-keeping, vermi-composting etc.
- g) Popularization of low cost poly house for vegetable nursery in the district.
- i) Need to work on most sustainable combination of Horticulture – agro-forestry crops.
- j) Introduction of Commercially viable medicinal crops.
- k) Marketing avenues for horticultural crops.

### **5.2 Social Forestry**

Forests are an integral part of agriculture and play an important role in the maintenance of ecological balance. Forests meet the basic requirement of fuel and timber. Agro forestry has been emerged as an important farming system there by helping the farmers in improving their livelihood. There are 3000ha area under forests in district Ambala constituting 3.25 % of total geographical area of the distt. And the state govt. has decided to

raise it upto 10% by 2010. The main forestry species available for potential areas in the distt. are poplar, eucalyptus, Kikar, Kadam, Shisham , Khair etc. Most of the social forestry is in govt. and village panchayat lands of institutions located in the district.

### **5.2.1 Present status of support services**

There is a forest department of Govt. of Haryana in the District. This centre produces quality seedlings of eucalyptus, high tech clonal eucalyptus planting material and these are supplied to farmers at reasonable price to boost the forestry in the district. Apart from the research centre, there are 45 govt nurseries in the district and there are private nurseries also to supply seedlings of poplar and eucalyptus.

### **5.2.2 Scope of agro forestry in the district**

There is a great scope of poplar plantation due to high demand by the plywood industry existing in the adjoining district Yamunanagar. The farmers can get better remuneration on additional income from poplar plantation in agro forestry system as intercrops like wheat, sugarcane, potato, berseem and other vegetables can be successfully grown during 4-5 years of plantation.

## **5.3 Animal Husbandry**

### **5.3.1 Introduction**

Livestock is an integral part of farming systems in Haryana and it plays a great socio-economic role in the state. Good infrastructural facilities with readily available inputs and good climate, marketing facilities for milk & meat and developing entrepreneurship qualities in farmers particularly dairy farmers are basic key factors for development of animal husbandry in the state and Ambala in particular. Per capita availability of milk in state is 660 g per day against recommended 250 g per day by ICMR.

### **5.3.2 Present Status**

As per 18<sup>th</sup> livestock census 2007 the number of buffaloes, cows, sheep, goats and

poultry including broilers& layers are 242177, 69588,17435,6429,709304, district Ambala. Producing milk 1.52lacs litter , meat 437 tonnes and eggs 776lacs annually.

At present there are 32 Govt. veterinary hospital and 98 govt. veterinary dispensaries in Ambala district. At present there are 30 veterinary graduates and 78 VLDA serving in district Ambala.

At present Department of Animal Husbandry and Dairying, Ambala is carrying out following activities and new proposals are also being given alongside.

### **State Cattle & Buffalo Breeding Programme:**

(a)	During Year 2007-08	Cow	A.I	:	24400
		Buffalo	A.I.	:	68000
	Proposal for year 2008-09	Cow	A.I	:	30000
		Buffalo	A.I.	:	80000

Artificial insemination by the way of frozen semen technology is done in veterinary institutions by veterinary surgeons and paravet (VLDA) which are thoroughly trained. Moreover refresher teaching at distt. Level and state level (TTI Hisar) is also being carried out.

Proposal of training is Block level training centres should be created which can become a platform for training of veterinary graduates in service, paravet staff as well as farmers so as to update their knowledge and skill.

Top quality bulls of HF Cow Bull, crossbred Bull, Murrah Bull with good pedigree record are available in three semen banks form where from semen shows are transported in liquid nitrogen jars to different veterinary institutions so as to make sure that top quality bull semen is available for each and every dairy farmer for use of its diary animal.

Doorstep A.I. services are being provided to farmers who are presently far off from

their nearest veterinary institutions.

Proposal is that on a pattern of every two villages a veterinary institution should be functional. More vaccines of poultry which presently poultry farmers are purchasing of their own should be made available.

### **5.3.3 Strategies for Animal Husbandry in XI plan**

#### **Upliftment of BPL families : Proposals**

1. Free insurance cover for dairy & other livestock for all castes.
2. Free A.I. for dairy animals
3. Interest free loan with higher subsidy.
4. Calf rearing feed free of cost for both cow & buffalo calves.
5. Free hormone therapy for repeat breeder of BPL family livestock.
6. Incentive for each BPL family who produces & maintain a viable calf of by breeding & rearing.

#### **Infertility Management:**

Infertility among dairy animals is causing major loss both to farmers as well as to state economy.

#### **Proposals**

1. Mineral Mixture in adequate quantities for each animal
2. Synchronization of estrous in such animals and then their A.I. after 72 hours.
3. Embryo transfer technology for animals.
4. Treatment of intrauterine infections by way of ecbolics and antibiotics.
5. Practically implement successfully & conveniently each and every policy of state govt.

## **Health care Aspects**

Free health check, treatment policy is functional and deworming, anti-diarrhoeal, stomachache, antiseptic dressing, vaccination is being given to each and every farmer free of cost.

Proposal for supply of following medicines in adequate quantities could prove more useful and will be a boom for dairy farmers.

- (a) Antibiotics as Amoxy doacillim, Ampiloxaciin, emoflorain, Gentamycin, Amikacin and third generation cephalosporins are need of hour.
- (b) Antibiotic, analgesics and anti-inflamnortory drugs viz Keloprogen, meloxicam, analgin, nimuslide
- (c) Antallergic drugs
- (d) Anti-ticks both in solution form to be used as spray and injectbles.
- (e) Anti diairhoeal
- (f) Boluses correcting ruminal atony & summihol pH.
- (g) Phenyl, T.T. oil, antibacterial & antifungal applications
- (h) Antiprotozoan drugs.
- (i) Bandages, cotton, disposable A.I. gloves.
- (j) Post mortem set, surgical instruments
- (k) Mineral mixture @ 12 kg per animal (adult) per year.

## **Vaccinations**

At present free H.S. vaccination and FMDV vaccination are done in cattle & buffaloes and sheep pox, ETV, PPR, R<sub>2</sub>B, FRDR for various species is done. Proposal is to get post bite rabies vaccination for each animal affect, in govt. veterinary institution.

## **Commercial High Tech Dairy of 20 milch animals**

Ten lacs for advanced high teach dairy commercial with 1.5 lac subsidy.

Generation of employment.

1. By way of establishment of mini dairy units, of 2 MA(Milch Animals),, 3MA, 5MA, 10 MA , 20 MA.
2. Training of farmers in poultry field for establishment of poultry units.
3. Training of farmers for sheep, & piggery units.
4. Training of farmers for processing and marketing techniques of milk & meat products.

#### **5.3.4 Other Schemes in Operation**

1. Supply of pedigree bulls to Gram Panchayats at subsidized rates
2. Murrah incentive money programme
3. Calf rearing scheme
4. Sheep unit scheme
5. Piggery unit scheme
6. Mini dairy scheme for widows, S/C case at higher subsidies.
7. S/C insurance: free livestock insurance of S/C farmer dairy animals.
8. Organization of calf rallies
9. Organization of livestock shows
10. Organization of health care camps
11. Women awareness camp: 1 camp per village per year should be held.



**Table: 37 Expenditure/layout plan proposed for next five year plan is as follows**

<b>Sr.No.</b>	<b>Particular</b>	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2001-12</b>	<b>Total</b>
1.	Artificial insemination proposed					
	No. of AI Cow	30000	33000	36000	39000	<b>138000</b>
	No. of AI Buff	80000	85000	90000	95000	<b>350000</b>
2.	Proposed expenditure on AI*					
	COW	30 lacs	32 lacs	35 lacs	40 lacs	<b>137 Lacs</b>
	Buffalo	80 lacs	85 lacs	90 lacs	95 lacs	<b>350 lacs</b>
3.	Health care aspect proposed expenditure	300 lacs	325 lacs	350 lacs	375 lacs	<b>1350 lacs</b>
4.	Vaccination expenditure (proposed)	150 lacs	165 lacs	175 lacs	190 lacs	<b>680 lacs</b>
5.	Upliftment of B.P.L families	10 lacs	15 lacs	20 lacs	25 lacs	<b>70 lacs</b>
6.	Infertility management	150 lacs	165 lacs	175 lacs	190 lacs	<b>680 lacs</b>
7.	Commercial	15	20	25	30	<b>90</b>
	Dairy of 200 milch animals	165 lacs	220 lacs	275 lacs	330 lacs	<b>990 lacs</b>
8.	Generation of employment	25 lacs	30 lacs	35 lacs	40 lacs	<b>130 lacs</b>
9.	Others	50 lacs	60 lacs	70 lacs	80 lacs	<b>260 lacs.</b>
<b>Total</b>		<b>960.00</b>	<b>1097.00</b>	<b>1225.00</b>	<b>1365.00</b>	<b>4647.00</b>

\* Artificial Insemination per animal @ Rs. 100/-

## **6 Fisheries development**

### **6.1 Introduction and present status**

The fish cultivation in the district Ambala is done mainly in village community panchayat ponds spread in an area of 385 ha. The fish production during the year 2006-07 was 1330 tonnes.

### **6.2 Development of Fisheries Water Resources:**

The fisheries is mainly in the village ponds/community ponds in the district. About

385 hectares water spread area of the community ponds are available in the district, out of which 320 hectares are covered under fish farming. The remaining water area can be covered under fisheries after technically renovation of the village ponds.

It is a fact that there are multidisciplinary uses of the community ponds in the villages apart from the fish farming. But unfortunately, these ponds are shrinking year by year because of silting, pollution, water-weeds and mainly illegal encroachment etc. So, technically renovation of village ponds is a need based activity which not only promote the fisheries but also generates the employment, income resources for panchayats, develop a common water resources/infrastructure for domestic uses/welfare for the people, harvest the excess rain water and recharge the water table etc. 25 hectare water area can be renovated every year @ 2.0 lakh per hectare.

### **6.3 Strengthening of National Fish and Seed Programme**

It is assumed that 0.6 ha. of hatchery can produced 20 lacs fingerlings and about 40lacs fingerlings are required for 1 ha. To meet out the increasing demand of quality fish seed (Fry, fingerlings, advance fingerlings), it is necessary to have fish seed farm. For this, the hatchery capacity can be improved with the latest technology. Apart from the improvement of Hatchery, other main infrastructure of the farm e.i. nursery ponds seed rearing ponds can be improved to increase their productivity. The maintenance of the seed farm and other important inputs infrastructure i.e., machinery, equipments, & tools, of latest technology is very important part of any seed farm to maintain and increase the production capacity of the seed farm. So these infrastructure at fish seed farm is need based for production of fisheries and welfare of fish farmers community.

### **6.4 Establishment of Fish seed farm/units by Fish Farmers :**

Some fish farmers may be motivated to establish their own fish seed Hatchery/fish seed rearing farms to meet out the increasing demand of Fish Seed especially fingerlings/advance fingerlings. So a project can be prepared to make establishment of two fish seed rearing hatcheries every year by the farmers in the district. For this, financial and technical assistance will be provided to the fish seed producers @ 50% portion of the total

cost of the project. Training, demonstration/exposure visit etc. will be arranged for fish seed growers as technical assistance.

#### **6.5 Financial Assistance to the Fish Farmers:**

Any person who adopt the fish farming for the first time should be assisted financially as well as technically. So the fish farmers should be assisted financially for arranging the fishery inputs (feed & fertilizer), machinery & equipments i.e. aeztors fishing nets, medicines, water pH testing meter etc. All these items should be supplied to the farmers during fish farming of first year once a time.50% portion of total expenditure on all these items can be provided as subsidy to the farmers. Fish seed should be supplied free of cost during first year.

#### **6.7 Fisheries Education, Training & Extension:**

It has a very important role in technical profession like fisheries on the other hand, fisheries is somehow a new subject though Ambala is a vegetarian area of the country. Therefore, it need more work in the field of fisheries extension. So, trainings at various level, demonstrations, exposure visits, Kisan gosthies etc. will be arranged to popularize the fish farming among the people and to transfer the technology to the fish farmers for increasing productivity .

**Table 38: Projected Outlay for Fisheries Development during XI Plan****(Rs.in lakh)**

A) Budget required in the existing schemes								
Sl. No	Name of the Schemes	Year					Total	Remarks
		2007-08	2008-09	2009-10	2010-11	2011-12		
1.	Development of fisheries water resources	50.00	60.00	70.00	80.00	100	370.00	25 Hect. Water area will be renovated per year @ Rs.2.00 lakh/hect cost may increase after two year
2.	Strengthening of National fish seed Dev. Program	20.00	20.00	25.00	30.00	30.00	125.00	To increase hatchery capacity, maintenance of well equipped fish seed farm
3.	Establishment of fish and farm/units by fish farmers	15.00	20.00	20.00	25.00	25.00	100.00	Two units every year will be established & fully equipped 5 lakh each (@ 50% portion)
4.	Financial assistance to the fish farmers	20.00	20.00	25.00	25.00	30.00	120.00	25 hect. Water area will be assisted every year @ Rs. 1.00 lakh/hect
5.	Fisheries education, training and extension	10.00	15.00	20.00	20.00	25.00	90.00	
	<b>G.Total</b>	<b>115.00</b>	<b>135.00</b>	<b>160.00</b>	<b>180.00</b>	<b>210.00</b>	<b>800</b>	

**Table 39 Proposal for Demons on Hort & Veg Crops (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Hort. Demons	40	40	40	40	40	200.00
Funds Required @ Rs. 0.1 Lacs Per Ha	4.0	4.0	4.0	4.0	4.0	20.00
Vegetable Demons	40	40	40	40	40	200.00
Funds Required @ Rs. 0.05 Lacs Per Ha	2.0	2.0	2.0	2.0	2.0	10.00

**Table 40 PROPOSAL for Capacity Building Horticultural staff (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Training of Hort. Staff (No)	5.0	5.0	5.0	5.0	5.0	25.00
No. of Trainees 15 per training	75	75	75	75	75	300.00
Cost per training @ Rs. 600 per training	0.45	0.45	0.45	0.45	0.45	2.25

**Table 41 Proposal for Capacity Building of Hort. Farmer (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
Number	5	5	5	5	5	25.00
Number of Trainees 25 per training	125	125	125	125	125	625.00
Cost Per training @ Rs. 400 Per trainee per day	0.5	0.5	0.5	0.5	0.5	2.5

**Table 42 Proposal for Bee Keeping Training (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
No. of Trainings for 3 days	2.0	2.0	2.0	2.0	2.0	10.00
25 Trainees per training	50	50	50	50	50	250.00
Cost per trainee @ Rs. 600 per training per day	0.3	0.3	0.3	0.3	0.3	1.5
No of Unit Establish	10	10	10	10	10	50.00
Cost of Unit Established @ Rs. 25000 per unit	2.5	2.5	2.5	2.5	2.5	12.5

**Table 43 Proposal for Mushroom Training (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
No. of Training two for Five days	2.0	2.0	2.0	2.0	2.0	10.00
No. of Trainees 25 per training	50	50	50	50	50	250
Cost of Training @ Rs. 1000 per trainees for 5 days	0.5	0.5	0.5	0.5	0.5	2.5
No. of Units to be established	10.0	10.0	10.0	10.0	10.0	50.00
Cost @ Rs. 1 Lac Per Unit	10.0	10.0	10.0	10.0	10.0	50.00

**Table 44 PROPOSAL for Vermi compost (Rs. in Lacs)**

Description	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
No. of trainings for 3 days	2	2	2	2	2	10
No of Trainees 25 Per Training	50	50	50	50	50	250
Cost of Training @ Rs. 600 per trainee per day for 3 days	0.3	0.3	0.3	0.3	0.3	1.5
No. of units to be established	25	35	40	50	50	200
Financial Help @ Rs. 20000 per unit	5.0	7.0	8.0	10.0	10.0	40.00

**Table 45. Projected Out Come and growth rate during the Plan Period (Horticulture & Veggies (Area - ha, Production – Q/ ha, Productivity --- Q/Ha.)**

Sr. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08(Projected)			2008-09(Projected)			2009- 10 (Projected)			2010-11 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1.	Horticulture crops															
1.	Mango	1012	9614	95	1000	9880	98.8	1050	10762	102.5	1060	11342	107	1080	12096	112
2.	Guava	77	770	100	75	780	104	80	864	108	80	896	112	85	994	117
3.	Sapota	46	322	70	50	365	75	50	380	76	55	434	79	55	451	82
4.	litchi	7	581	83	5	430	86	05	445	89	5	460	92	5	475	95
5.	Peach	40	475	125	45	585	130	45	607	135	15	700	140	50	725	145
6.	Pear	31	532	190	30	591	127	25	512	205	25	532	213	20	444	222
7.	Plums	26	427	178	25	462	185	20	384	192	22	440	200	25	520	208
	Total	1350	12850	841	1230	1393	803.8	1275	13954	907.5	1297	14804	943	1320	15705	981
	Vegetable crops															
1.	Potato	235	52150	190	2850	56145	197	2900	59450	205	2900	61770	213	2950	65490	222
2.	Onion	1507	27126	180	1550	29158	188	1550	30225	195	1600	32480	203	1600	33920	212
3..	Tomato	1505	11035	80	1550	12865	83	1500	12900	86	150	13950	90	1500	13950	93
4.	Radish	1355	24222	180	1400	26320	188	1400	27300	195	1300	26390	203	1300	27456	2112
5.	Carrot	2620	25280	100	2650	27560	104	2650	28620	108	2700	30240	112	2700	31590	117



Sr. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08(Projected)			2008-09(Projected)			2009- 10 (Projected)			2010-11 (Projected)		
6.	Chillies	940	8192	80	900	7470	83	900	7740	86	850	7650	90	850	7905	93
7.	Cauliflower	1735	31385	180	1750	32900	188	1750	34125	795	1800	36540	20.3	1800	38160	212
8.	bhindi	2165	12255	60	2100	13125	62.5	2100	13650	65	2120	14416	68	2120	15052	71
9.	Brinjal	1485	24760	160	1450	24142	166.5	1450	25085	173	1400	25200	180	1400	25900	185
10.	Leafy vegs	2240	14847	90	2000	18800	94	2000	19600	98	1800	1810	101	1800	18900	105
11.	Cucurbits	3550	23085	70	3550	25915	73	3550	26980	76	3600	28440	79	3600	29520	82
	Total	25910	276682	1350	21750	274400	1427	21750	285675	1482	22620	364108	1542	21620	307843	3504

## **CHAPTER-VI**

### **District Plan**

#### **6.1 Introduction**

The proposed district plan includes agriculture, horticulture, forestry, animal husbandry and fisheries as the major activities undertaken in the district Ambala. The existing status of these sectors have 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) Increasing area under hybrids in rice, improved varieties in wheat and sugarcane and high yielding hybrids in sunflower.
- b) Adoption of resource conservation technologies at large scale.
- c) Mechanization for increasing water use efficiency.
- d) Increasing seed replacement rate.
- e) IPM, INM and IWM.
- f) Enrichment of technical know how through demonstration , training and farmer participatory approach.
- g) Human resource development.
- h) Promotion of Agro Processing Industries.

### **6.2.2. Horticulture**

- a) Availability of good quality saplings.
- b) Awareness regarding proper fertilization in orchards.
- c) Need to work on most sustainable combination of Horticulture – Agro forestry crops.
- d) rejuvenation of neglecting and old orchards with yielding varieties.
- e) Introduction of commercially viable medicinal corps.
- f) Marketing Avenues for Horticultural Crops .
- g) Development of Eco-friendly IPM strategies for major horticulture corps.

### **6.2.3 Forestry:**

- a) Increasing area under forests through plantation in community lands.
- b) Free supply of forest plants for creating interest in forestry.
- c) Increasing area under value added forestry trees.

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

- a) Establishing new Govt. Veterinary Hospitals and dispensaries for easy access to livestock farmers.
- b) Encouraging artificial insemination (A.I.) for breed improvement and ultimately milk yield per animal per unit time.
- c) Health care services by providing medicines and free health check camps in villages.
- d) Enhancing vaccination programmes to escape the animals from seasonal diseases.

- e) Infertility management by supply mineral mixture in adequate quantity for livestock.
- f) Establishing commercial dairy farming for income and employment generation.
- g) Supply seed of forage crops to provide fodder round the year.

### **6.2.5 Fisheries :**

- a) Development of water resources for fisheries.
- b) Making availability of good quality fish seed by strengthening the existing fish seed farm in district.
- c) Encouraging fish farmers for fish seed production to meet the requirement.
- d) Promoting assistance to farmers in the beginning of fisheries as an enterprise.
- e) Education and training to farmers and human resource development of technical staff of fisheries department.

## **6.3 Innovative Schemes:**

### **6.3.1 Agriculture**

- A) Improving irrigation efficiency
- B) Linkages and synergies with private as well as public sector for hybrids development and proliferation in rice and sunflower.
- C) Resource conservation technologies including green manuring with dhaincha, sowing of wheat with zero till seed cum fertilizer drill, laser leveling, bed planting.
- D) Multiple land use techniques by infusing summer moong in rice-wheat cropping system
- D) IPM, INM and IWM.

- E) Demonstrations, trainings and farmer field schools.
- F) Integrating live stock with crop cultivation .
- G) Strengthening of Extension services for affecting transmission of technologies .
- H) More emphases on refinement and standardization of technologies such as direct seeded Paddy , soil reclamation , sugarcane planting etc.

**F) Mechanization**

The labour is becoming scarce and for timely farm operations the farmers are using various types of farm machinery but due to heavy prices of these second generation machines there is need to provide subsidy on farm machinery. (Table 45)

**Table 46: Tools Utilized for improving Crop Production**

Name of crop	Area under crop(ha)	Type of crop production tools	Area under crop production tools(ha)	Proposed area under crop production tools(ha)					Name of the Persistence technology	Reason of shortfalls of technology	Remedies suggested for adoption of technology	Remarks
				2007-08	2008-09	2009-10	2010-11	2011-12				
Wheat	85000	Rotavator	10000	10000	1000	2000	2500	3000	Sowing, Ploughing & Planting	Not within reach of common farmer	Intial cost of cultivation is heavy	Deptt. may provide subsidy
		Bed Planter	-	25	50	100	150	200	Ploughing, Bed making	Heavy h.p. machinery is needed	-	Deptt. may provide subsidy
		Zero Tillage	60000	22000	25000	27000	29000	30000	Sowing & Ploghing	Within the reach of common farmer	-	Deptt. may provide subsidy
		Land leveller	-	-	50	70	100	125	Level the field	Not within reach of common farmer	-	
Paddy	78000	Paddy transplater	-	-	-	5	10	15	Demonstration			
		Direct or seed drill	-	-	-	5	10	15	Demonstration			
		Bed Planter	-	-	-	5	10	15	Demonstration			

Name of crop	Area under crop(ha)	Type of crop production tools	Area under crop production tools(ha)	Proposed area under crop production tools(ha)					Name of the Persistence technology	Reason of shortfalls of technology	Remedies suggested for adoption of technology	Remarks
				2007-08	2008-09	2009-10	2010-11	2011-12				
S.Cane	16000	Pit Method	5000	2000	2200	2500	2700	3000	Heavy labour and intial cost expensive	Requirement of technology		
		S.Cane Planter	-	-	10	15	20	25	Erratic Rust			
Wheat & Paddy	85000	Reaper cum binder	65000	1500	11000	12500	13500	15000	Harvesing and bundle making	Intial cost high	Availability not easy	
	& 78000	Straw reaper	20000	500	500	650	700	800	Making of straw after harvesting by combine	-do-	-do-	Govt. provides subsidy

### **6.3.2. Horticulture:**

- a) Production and availability of good quality samplings.
- b) Micro-irrigation in fruit crops
- c) Mushroom, bee keeping, vermin composting and low cost poly house.
- d) IPM and INM
- e) Demonstration, trainings and farmer field schools.
- f) Seed replacement rate of major vegetables crops.
- g) Improvement in marketing infrastructure
- h) Encouragement of value added food products.

### **6.3.3. Forestry :**

- a) Plantation of valued added
- b) Strengthening of forest nursery
- c) Agro-forestry for multiple land use
- d) Demonstrations and trainings.

### **6.3.4. Animal Husbandry :**

- a) Upgradation and promotion of indigenous breeds
- b) Artificial insemination
- c) Mineral mixture for improving fertility of animals.
- d) Commercial dairying



- e) Vaccination
- f) Increasing area under fodder crops.
- g) Human resource development of staff.
- h) Establishing new hospitals

#### **6.3.5. Fisheries :**

- a) Renovation of community ponds
- b) Fish seed production
- c) Training and extension activities for farmers.
- d) Human resource development of staff.

### **6.4 Vision of XI Plan**

#### **6.4.1 Agriculture**

Increasing productivity of major crops by increasing area under hybrids of rice and sunflower, improved varieties of wheat and sugarcane while adopting resource conservation techniques (sowing of wheat with zero drill, bed planting, laser leveling, green manuring) for saving water resource and improvement of soil health and encouraging multiple land use (summer moong) by increasing cropping intensity and intercropping.

#### **6.4.2 Horticulture**

Promoting fruit, vegetable and floriculture crops and increasing their productivity by providing good quality planting material of fruit crops and seed for vegetable crops. Increasing optimal use of irrigation water introducing micro-irrigation in fruit crops and production of pesticides residue free fruits and vegetable popularizing IPM and INM, establishment of valued added food processing units in the district will also excel rate the

viability of horticultural crops and provide employment to the youth of the district. Encouraging rural youth for income generating vocations like mushroom, bee- keeping, vermi- composting and nursery raising in low cost poly house.

#### **6.4.3. Forestry**

Providing environmental safety through afforestation and increasing income by introducing agro-forestry for multiple land use and efficient utilization of resources.

#### **6.4.4. Animal Husbandry**

Increasing milk availability per capita per unit time through improving animal breeding and animal health by decreasing infertility and providing mineral mixture and green fodder round the year.

#### **6.4.5 Fisheries**

Increasing fish production through spread in community ponds by providing sufficient fish seed and increasing income of Gram Panchayats by proper use of community ponds creating employment avenues.

### **6.5 Financial Proposals for XI plan in Agriculture and Allied Sectors.**

#### **6.5.1 Financial Proposals for XI plan in Agriculture**

**Table 47 : Financial outlays for different crops in XI Plan**

<b>Crops</b>	<b>Fin. (Rs. in lacs )</b>
<b>Wheat</b>	<b>5350</b>
<b>Rice</b>	<b>678.0</b>
<b>Sugarcane</b>	<b>50.0</b>
<b>Sunflower</b>	<b>5.0</b>
<b>Total</b>	<b>1268.0</b>

**Table 48 : Financial outlays for Resource Conservation Technologies in XI Plan**

<b>RCTs</b>	<b>Fin. (Rs. in lacs )</b>
<b>Zero Tillage</b>	<b>18.75</b>
<b>Bed Planter</b>	<b>20.0</b>
<b>Laser Leveler</b>	<b>810.0</b>
<b>Direct seeding of rice</b>	<b>25.0</b>
<b>Alternate wetting and drying in rice</b>	<b>7.5</b>
<b>Green manuring</b>	<b>315.0</b>
<b>Summer moong</b>	<b>112.5</b>
<b>Total</b>	<b>1308.75</b>

**Table 49: Financial outlays for different management activities(crops) in XI Plan**

<b>Activities</b>	<b>Fin. (Rs. in lacs )</b>
<b>Intgrated Nutrient Management(INM)</b>	<b>28.0</b>
<b>Intgrated Pest Management(IPM)</b>	<b>52.0</b>
<b>Intgrated Weed Management(IWM)</b>	<b>60.0</b>
<b>Water Management</b>	<b>5.0</b>
<b>Total</b>	<b>145.0</b>

**Table 50 : Financial outlays for different other activities(crops) in XI Plan**

<b>Activities</b>	<b>Fin. (Rs. in lacs )</b>
<b>Seed Planning</b>	<b>17.5</b>
<b>Seed Treatment</b>	<b>1600.0</b>
<b>Mechanization</b>	<b>52.5</b>
<b>Capacity Building</b>	<b>29.8</b>
<b>Exposure Visits</b>	<b>25.0</b>
<b>Total</b>	<b>1724.8</b>

**6.5.2 Financial Proposals for XI plan in Horticulture****Table 51 : Financial outlays for different horticulture crops and subsidiary occupations in XI Plan**

<b>Crops/Activities</b>	<b>Fin. (Rs. in lacs )</b>
<b>Vegetable crops</b>	<b>10.0</b>
<b>Fruit crops</b>	<b>20.0</b>
<b>Mushroom</b>	<b>52.5</b>
<b>Bee-keeping</b>	<b>14.0</b>
<b>Vermi-composting</b>	<b>41.5</b>
<b>Total</b>	<b>138.0</b>

### 6.5.3 Proposals of Animal Husbandry for XI Plan

**Table 52 : Financial outlays for Animal Husbandry in XI Plan**

<b>Activities</b>	<b>Fin. (Rs. in lacs )</b>
<b>Artificial Insemination(A.I.)</b>	<b>487.00</b>
<b>Health care aspects</b>	<b>1350.00</b>
<b>Vaccination</b>	<b>680.00</b>
<b>Infertility management</b>	<b>680.00</b>
<b>Upliftment of BPL families</b>	<b>70.00</b>
<b>Commercial dairying</b>	<b>990.00</b>
<b>Employment generation</b>	<b>130.00</b>
<b>Others(Fodder crops and capacity building)</b>	<b>260.00</b>
<b>Total</b>	<b>4647.00</b>

### 6.5.4 Projected Outlay for Fisheries Development during XI Plan

**Table 53 : Financial outlays for Fisheries in XI Plan**

<b>Activities</b>	<b>Fin. (Rs. in lacs )</b>
<b>Development of fisheries water resources</b>	<b>370.00</b> <b>25 Hect. Water area will be renovated per year @ Rs.2.00 lakh/hect cost may increase after two year</b>
<b>Strengthening of National fish seed Dev. Program</b>	<b>125.00</b> <b>To increase hatchery capacity, maintenance of well equipped fish seed farm</b>
<b>Establishment of fish and farm/units by fish farmers</b>	<b>100.00</b> <b>Two units every year will be established &amp; fully equipped 5 lakh each (@ 50% portion)</b>

<b>Financial assistance to the fish farmers</b>	<b>125.00</b>	<b>25 hect. Water area will be assisted every year @ Rs. 1.00 lakh/hect</b>
<b>Fisheries education, training and extension</b>	<b>90.00</b>	
<b>Total</b>	<b>800.00</b>	

#### **6.5.5 Proposal for XI Plan for forestry in the district**

**Table 54 : Financial outlays for Forestry in XI Plan**

<b>Activity</b>	<b>Fin. (Rs. in lacs )</b>
<b>Free supply of plants to farmers</b>	<b>35.00</b>
<b>Agro forestry</b>	<b>2.50</b>
<b>Total</b>	<b>37.50</b>

### **SUMMARY OF PROPOSALS FOR XI PLAN IN AGRICULTURE AND ALLIED SECTORS**

**Table 55 : Financial outlays for Agriculture and allied sectors in XI Plan**

<b>Activity</b>	<b>Fin. (Rs. In lacs )</b>
<b>Agriculture</b>	<b>4473.0</b>
<b>Horticulture</b>	<b>30.0</b>
<b>Animal Husbandry</b>	<b>4647.00</b>
<b>Fisheries</b>	<b>800</b>
<b>Forestry</b>	<b>37.50</b>
<b>Allied Enterprises</b>	<b>108.0</b>
<b>Capacity Building</b>	<b>30.25</b>
<b>Exposure Visit &amp; Monitoring</b>	<b>30.0</b>
<b>Total</b>	<b>10155.75</b>

**Table 56 Consolidated Plan of Distt. Ambala (Rs. in Lacs)**

<b>Budget Proposed</b>	<b>2007-2008</b>	<b>2008-2009</b>	<b>2009-2010</b>	<b>2010-2011</b>	<b>2011-2012</b>	<b>Total</b>
Agriculture	840.45	825.9	881.85	924.05	1000.75	4473.00
Animal Husbandry	---	960.00	1097.00	1225.00	1365.00	4647.00
Fishery	115.00	135.0	160.0	180.0	210.0	800.00
Horticulture	4.0	4.0	4.0	4.0	4.0	20.00
Vegetables	2.0	2.0	2.0	2.0	2.0	10.00
Capacity Building	6.05	6.05	6.05	6.05	6.05	30.25
Exposure Visit Monitoring & Evaluation	6.0	6.0	6.0	6.0	6.0	30.00
Allied Enterprises						
a. Bee Keeping	2.8	2.8	2.8	2.8	2.8	14.0
b. Mushroom	10.5	10.5	10.5	10.5	10.5	52.5
c. Vermi composting	5.3	7.3	8.3	10.3	10.3	41.5
Miscellaneous	7.5	7.5	7.5	7.5	7.5	37.50
<b>G. Total</b>	<b>999.6</b>	<b>1967.05</b>	<b>2186.00</b>	<b>2378.20</b>	<b>2624.90</b>	<b>10155.75</b>

## **Conclusion**

Agriculture is the core sector of Ambala Distt. Economic with nearly 92% of the geographical area under plough with a cropping intensity of 154.2% . Rice & wheat cropping system plays a vital role in the food grain production and along accounts for 86% area in district. Green revolution varieties contributed to a significant increase in productivity of both rice and wheat. The productivity gain achieved in post green revolution era through adoption of high yielding varieties and technology mission programmes has seemed to be plateaued. The damaging nature of Rice-wheat cropping system led to the second generation problems related to soil productivity, herbicides resistance, reduced water use efficiency in the system as a whole have become a major issue. Continued decline in water tables calls for augmentation of the existing water supplies through rain water harvest and demand management. There is a feasibility of support higher percent of rice-wheat by reducing irrigation and increasing water use efficiency by farm mechanization. Further intensification in agriculture is there fore imperative through technological intervention followed up with appropriate extension service so as to increase productivity and maintain production in line with population growth in a sustainable manner. The increase target of eleventh five year plan could be not only by the greater adoption of efficient higher technology level in all cropping system. This would required large scale arability machinery for land leveling (Laser land leveler) tillage (especially Zero tillage machine, bed planter, paddy transplanter etc. it is also expected that more land will be available on lease and farmers there for would need more machinery for saving labour and increasing the efficiency on inputs . Goal is to increase productivity at 4% per year, reduce water consumption by 10% in each cropping system, energy consumption by 10%. Saving in energy consumption is expected to reduce the associated carbon dioxide emission for clean healthy environment.

High productivity model would required more pesticides, or hybrids, technologies requiring more inputs or G.M. Crop. The pesticides residue or risk associated with the development of resistance in pests or weeds need to be monitored regularly. IPM, IWM, INM models need to be used friendly. Resistant vars. GM crops and biological control will define the agents of IPM in the next generation and it is here the role of biotechnology comes. Labour oriented components will have to be less adopted as the labour in near future

is scarce and costly and this will demand still more mechanization for sowing harvesting, storage and processing.

The farmers have become important competitors in all sorts of agricultural produce, from cereal to milk, mushroom, honey, vegs. & even fisheries and it has been fully envisaged that most of the farming family can not drive their income solely from crop based agriculture and there is urgent need to identify farm entrepreneurs for improving their living standard by increasing their farm income. Economic development of rural people and the state depends upon w best natural resources are to be used. Knowledge and skills of farmer and extension agencies help us to understand the farming system better. The way urbanization is happening in Haryana also calls creation of culture that helps farmers to adopt subsidiary occupations.

Last not the least more and more infrastructure, strong linkages between the allied department coupled with data center may be strengthened and enriched in any aspect so that the latest and effective technology may be transfer to the farming community in toto for sustainable growth & production