

DRAFT PLAN

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

**DISTRICT FATEHABAD
HARYANA**

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

FOR RASHTRIYA KRISHI VIKAS YOJANA

OF XITH FIVE YEAR PLAN

CONTRIBUTORS

DR. G. R. SINGH, SR. COORDINATOR

DR. S. S. PILLANIA, HORTICULTURE

DR. ANIL RATHI, AGRIL. ECONOMIST, KVK SONEPAT

DR. RAMESH SHARMA, SOIL SCIENTIST, KVK SONEPAT

DR. SURENDER SINGH DAHIYA, AGRONOMIST, KVK SONEPAT

&

DISTRICT'S OFFICERS OF LINE DEPARTMENT

DISTRICT FATEHABAD

HARYANA

CONTENTS

CHAPTER I	Introduction	1
CHAPTER-II	General Description of the District	9
CHAPTER III	SWOT Analysis of the District	16
CHAPTER IV	Development of Agriculture Sector	24
CHAPTER V	Allied Agricultural Sectors	77
CHAPTER VI	District Plan	113

LIST OF TABLES

Table 2	Land utilization Statistics (preceding 3 years average)	25
Table 4	Land Holdings (Agriculture Census 2001)	26
Table 3	Planning of Agriculture Inputs in the District – Seed	30
Table 4.1	Training Proposed for Capacity Building of Agriculture Staff (at District level)	66
Table 4.3	Training Proposed for Capacity Building of Farmers at block level	67
Table 4.2	Training Proposed for Capacity Building of Farmers at district level on different technologies	68
Table 4.4	Varietal Demonstration in Next Five Year	69
Table 4.5	INM Demonstrations in Next Five Years	70
Table 4.6	Demonstrations on Resource Conservation Technologies	71
Table 4.7	IPM Demonstrations in Next Five Years	72
Table 4.8	Farmer Field Schools covering identified critical technologies in Next Five Years	73
Table 4.9	Group formation /Commodity interest groups formation for specific activities	74
Table 28 a	Area, Production and Productivity Trend of Main Crops in the District	75
Table 66	Agro Processing Unit in the District (including Sugar, Milk, Silk, etc., related to Agriculture only)	86
Table 5.1	Training Proposed for Capacity Building of Allied sectors Staff on different aspects covered under Plan(at District level)	103
Table 5.2	Planning for Farmers Training for Capacity Building and Skill Upgradation Related to Allied fields (at district level)	104
Table 5.3	IPM Demonstrations in Horticultural crops Next Five Years	105
Table 5.4	INM Demonstrations in vegetable crops in Next Five Years	106
Table 5.5	Varietal Demonstrations to be conducted in vegetable crops in Next Five Years	107

Table 5.6	Demonstrations on important aspects identified in the Plan in allied sectors/ enterprises	108
Table 5.7	Farmer Field Schools covering identified critical technologies in Next Five Years	109
Table 5.8	Group formation /Commodity interest groups formation for specific activities	110
Table5.9	Area, Production and Productivity Trend of Main Crops in the District (hort. /veg. crops)	111

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 Gross Domestic Product (GDP) especially during the recent years. However, the agriculture sector which accounted for more than 30 percent of GDP at the beginning of reforms failed to maintain its pre-reform growth. On the contrary, it witnessed a sharp deceleration in growth after mid 1990s as 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, on the face that the potential for the growth of agriculture is enormous. The 10th five year plan target of growth of 4 percent per annum in agriculture and allied sectors was set to reverse the sharp deceleration in agricultural growth during the period of 1996-1997 to 2001-2002, has not been achieved. The approach paper to the 11th plan emphasized to restore the growth of agriculture and allied sector with conjunction of knowledge and technology oriented to individual stake holder particularly the landless and small farmers. A sustained growth of agriculture is central to the welfare of 68 percent of population. Potentially attained level of agricultural growth is the need of the country, to meet the demand of food, fodder and fuel to achieve animal health, human health and energy needs in consolation of import burden and enhance export.

In light of decelerated growth of agriculture, the National Development Council (NDC), in its meeting held on 29th May, 2007 resolved that a special Additional Central Assistance Scheme i.e. National Agriculture Development Programme (NADP)/ Rastriya Krishi Vikas Yojana (RKVY) be launched with following main objectives.

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

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

The eligibility for assistance from the Centre under the scheme would depend upon the State Government providing amounts in the Plan Budget of the State for agriculture and allied sectors over the baseline expenditure.

As per the NDC resolution, Government of India introduced a new Additional Central Assistance Scheme to incentivize States to draw up plans for their agriculture sector more comprehensively, taking agro-climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries etc. This involves a new scheme for Additional Central Assistance above its existing centrally sponsored schemes, to supplement the state- specific strategies. In order to revive the agriculture growth during XIth plan with the target of 4 percent per annum (as per NDC commitment) the development strategies are reoriented to involve all stack- holder in planning process with defined goals and gains. The XI Plan provides an +opportunity to explore the available resources and knowledge to achieve a new vision based on faster, broad-based and inclusive growth. It is designed to reduce poverty and focus on to eliminate the various divides that continue to fragment our society. It aims at putting the economy on a sustainable growth trajectory with a GDP growth rate of approximately 10 percent by the end of plan period and target a robust agricultural growth at 4 percent per year. 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 was initially mooted in 1st Five year plan in 1951. It could not be materialized in true sense as only sporadic efforts and isolated cases of such planning were practically attempted. For success of local area or District level plans the underlying constraints needed to be identified and required infrastructural investment, extension and research system revamping and market reach with the system's conduct and performance have to be synchronized through a holistic policy approach. Keeping this in view the C-DAP of district Fatehabad is prepared for achieving potential and sustainable agricultural growth with augmenting farmers' income through participatory process involving stakeholders. By establishing strong linkages with required institutional support services, the plan will ensure optimum utilization of natural, physical and financial resources. The Agriculture in Fatehabad district can't possibly achieve same growth as in the past without recognizing the role of farmer's participatory approach for formulating strategies and finding solutions to new and emerging problems. Similarly due to globalization, trade in agriculture will expand and the district like Fatehabad 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 threat and opportunities of globalization will have a bearing on farmers of distt. Fatehabad. Quality awareness and quantity agreement is the pre requisite of world trade under globalization. Reforms based on globalization can now pave the way for quality improvement in agriculture produce, post harvest management, processing of horticulture produce and commercial dairies. The demographic changes due to fast urbanization and slow down in the population growth will bring greater prosperity in the middle class families. This will lead to enhanced demand of quality food leading to more animals and requirement of more cereals for animals. Food demand will go up not only because of population rise but also because of more requirement of cereals as animal feed. Land availability for agriculture will decrease in District Fatehabad, hence to sustain the level of production, increase the profitability, the productivity has to be increased through conjunction of knowledge and advanced technology. New science like GM crops, and new approaches like resource conserving technologies will always help us to face new challenges in agriculture development.

Methodology

The C-DAP was prepared as per the process and methodology suggested by the Planning Commission, Government of India. The approach followed in preparation of the document was essentially of Participatory Appraisal mode. CCS Haryana Agricultural University, Hisar, 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 meetings and did hand holding where ever needed for plan preparation.

The responsibility of preparing C-DAP of Fatehabad district was given to Krishi Vigyan Kendra, Fatehabad. The KVK team, after receiving proper training from TSI held wide consultations with District/ Block/ Village Agriculture Planning Units of the District. The TSI conducted two days orientation workshop-cum-training programme on 30.3.08 and 31.8.08 at CCSHAU, Hisar. The following specific aspects were covered in the programme.

- Issues 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
- Integrated nutrient management(INM),Integrated pest management(IPM), Natural resource management (NRM),Human resource development(HRD), Marketing and other important aspects.
- Threats and Opportunities of WTO.

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

Primary Data: For in-depth farm/ village level study covering important aspects of agriculture and allied fields, the district was divided into two distinctively Agro-eco-situations (AESs) as was done for SREP preparation under ATMA Scheme. From each AES one representative village (AES-1 Khabra kalan, AES-2 Nikuwana) was selected for collecting required information on modified semi-structured schedules through PRA.

Con-current review and verification of data: The primary as well as secondary data collected was cross-checked through triangulations and verified from information available with different government departments and PRA based exercises (earlier conducted by KVK and other agencies). The District Plan, SREP and PLP of Fatehabad district and other related documents/reports of different departments were consulted for preparing the C-DAP.

Holding farmer meetings at villages selected for representing AESs in the district

PRA was conducted covering the whole gamut of activities ranging from planning to post-harvesting and marketing related to agriculture and allied activities being undertaken by the villagers and preference and need of the consumer, the ultimate goal of production.

Work plan and activities before the preparation of plan-

- Meeting of resource team of KVK with line departments heads and officers and PRI's representative
- Discussed the farmer participation evaluation time frame, activities and

responsibilities of all involved in the plan.

- Discussed the plan and expected output from five year plan in progress. **The stake holders were made clear about subsidies for seed, fertilizer and other inputs. Gaps that exist in achieving the targeted productivity growth across farmers categories were identified through participatory process. This provided a sound base** in developing Comprehensive District Agriculture Plan (C-DAP).

Following discussion were held-

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

Before meeting-

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

During meeting-

- The meetings were ensured to be informal. The farmers were encouraged to participate, interact and make their own fair appraisals in the meeting. Lecture type meeting was avoided. Farmers were informed about the objective of the meeting. The dialogue was started; the gap analysis and current scenario regarding sustainability, productivity, profitability , marketing issues and risks associated with different cropping systems were discussed.

The possible changes targeted in the management practices were:

- Field preparation-zero tillage, bed planter, laser leveler
- Crop establishment-Plant population, seed rate etc.
- Nutrient management-N and P rate, time, source, use of organic manure, basal and top dressing of fertilizer, application of K and micronutrients.
- Important pests based on economic importance including insects, diseases nematodes and weeds.

Measures which improve the efficiency of inputs including water (by improving water productivity), energy (by reducing energy intensity like less fuel and less electricity) and labour(mechanization).It has to be a campaigning tool and also a guide to policy.

To improve both productivity and profits and to generate rural employment, another option might be to reset the system approaches from a commodity approach to cropping system approach (Rice-wheat cropping system rather than rice or wheat as a separate commodity) and from cropping system approach to a farming system approach (Wheat-Buffalo).

- Farmers and scientist came to general agreement on what to do to fill the gap on crops and allied activities.

Discussed about the proposed design, trials, Front line demonstration(FLDs) and other activities in a farming system approach keeping in view the following-

- Profitability of cropping system and the rate of return. In order to achieve the rate of return, long term family support is suggested.
- Market infrastructure and marketing opportunities, custom hire services and some of the policy issues related to subsidy.
- Appearance of natural calamities and their mitigation.
- Farmers' inability to invest in the productivity improvement.

- Work plan and activities for landless and resource poor farmers.
- Feed back regarding On-Farm and Off- Farm activities.
- Crop insurance and cyclical assistance.
- Action Plan

CHAPTER-II

General Description of the District

Fatehabad district came into existence on July 15,1997. It was carved out of Sirsa and Hisar districts. The district has three sub divisions namely Fatehabad, Tohana, Ratia and six development blocks namely Fatehabad, Tohana, Ratia ,Bhuna. Bhattu-kalan and Jakhal.. Fatehabad is located at 29.30° N 75.27° E. It has an average elevation of 224meters (734feet). This city is situated on National Highway No. 10 connecting the Sirsa to Delhi. Also, it is connected through road network to Bhatinda, Patiala and Sangrur in Punjab. Nearest Airports are Chandigarh & Delhi. Fatehabad is a city and a municipal council in Fatehabad district in the Indian state of Haryana.

Fatehabad is situated in Western Haryana. The Fatehabad district is surrounded by Punjab in North, Hisar district in East and Rajasthan in South and Sirsa district in West. It has a total geographical area of 252304 hectare. As of 2001 Indian census, Fatehabad had a population of 806158. Males constitute 53 % of the population and female 47%. Ghaggar River is passing through Northern western part of the district. The district has adequate drainage facilities. The important drains prevent the district from floods. The water of the river and drains can be harvested for crop production.

Climate-The climate of Fatehabad district is of very pronounced character i.e. very hot in summer and very cold during winters. Temperature ranges from -1 to 48 degree Celsius. Annual rain fall is 267 mm. Topography of the district is plain and sand dumes. Soils are sandy, sandy loam and clay with pH ranging from 7.5 to 9.00. In Fatehabad 56%, 36% and 8% water poor, marginal and good quality respectively.

Crops- Paddy-wheat and cotton-wheat is the main crop rotation followed in the district. The average yield of paddy, cotton and wheat are 62.82, 6.49 and 44.24 quintals per hectare respectively. The other crops grown are guar , bajra, sugarcane, oilseeds and pulses. Buffalo is the main milch animal followed by cow, sheep and goat. Horticultural and vegetable crops are cultivated in the district in scattered form meant for home consumption. Now, the Fatehabad district is gaining momentum to produce kinnow for

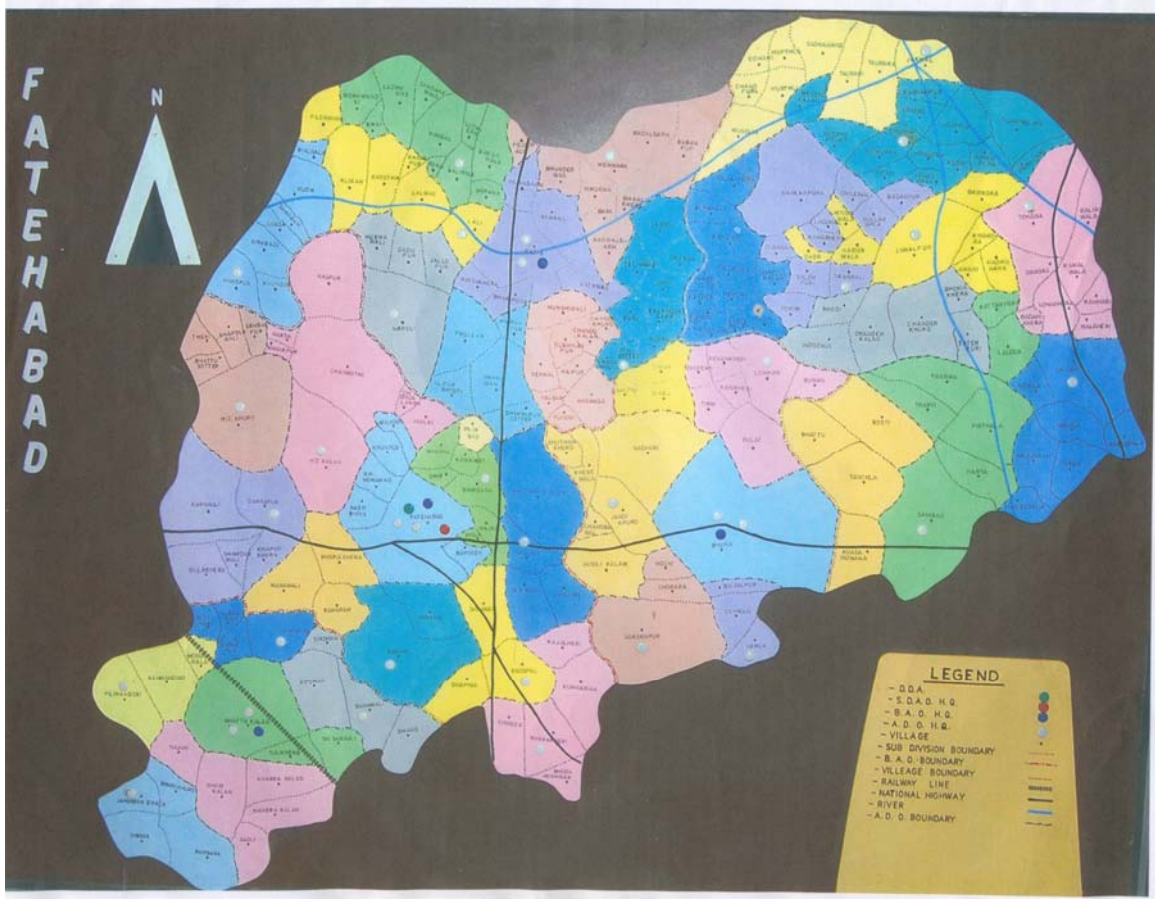
domestic and international markets. Agro-forestry trees like jandi is a part and parcel of farming system since time memorial.

District at a glance

No. of blocks	6
Total villages	244
No. of gram Panchayats	244
Total Population	806158
Male population	427862
Female population	378296
SC/ST population	221107
SC./ST male population	116698
SC/ST Female population	104409
Total literacy (%)	392198(48.65%)
Male (%)	243492
Female (%)	148686
SC /ST total literacy	73770
SC/ST Male Literacy	48793
SC/ST Female Literacy	24977
Total geographical area (ha)	252304
Net cultivated area (ha)	219201(86.88%)
Gross cropped area (ha)	408829
Cropping intensity (%)	192
No. of farm families	98371
Marginal farmers (0-1 ha)	34431(35.00)
Small farmers (1-2 ha)	24018(24.42%)
Semi medium farmers (2-4 ha)	21733(22.09%)
Medium farmers (4-10 ha)	14643(14.88%)
Large farmers (> 10 ha)	3545(3.60%)
Major crops	

Paddy (ha)	70243
Wheat (ha)	177591
Sarson(ha)	13320
Bajra (Ha)	12000
Cotton (ha)	91137
Guar(ha)	29000
Sugarcane (ha)	4000
Horticulture (ha)	11379
Forest Area (ha)	226
Irrigation by canal (ha)	100001(46.23%)
Irrigation by Tube well (ha)	98397(45.49%)
Livestock	
Cross bred cows	19645
Indigenous cow	63385
Improved buffalo	192116
Indigenous buffaloes	112169
Improved sheep	1687
Indigenous sheep	36928
Improved goat	---
Indigenous goat	14284
Others	36916
Poultry (broiler)	422750
Poultry (layer)	8700
Milk production per animal (Kg/lactation)	4000
Vety. Health Institutions	125
Average yield (q/ha.)	
Paddy	62.89
Wheat	44.24
Mustard	14.27
Cotton	6.49
Guava	87.0
Ber	86.0
Aonla	68.0
Others	62.0

District Map



The Vision

Fatehabad and the adjoining district Fatehabad are best places for cotton -wheat cropping systems (CWCS). Five years ago cotton cultivation was considered to be threat due all sorts of problems related with resistance development in *Helicoverpa* against pesticides. Farmers, policy makers and scientists were in a dilemma to find solutions to such new and emerging problems. A major shift in the technology change was expected. The whole idea of varietal release and recommendations for alternate management options required a paradigm shift in the process of generating recommendations. Since the farmers in this region are very competitive, they started bringing the seed of Bt cotton from states like Gujrat and got the success of making the cultivation of cotton more profitable. Things have moved on since last three years and now many new Bt hybrids

keep arriving in the market.

The district has seen cotton productivity rising fast as new Bt hybrids arrived and many farmers further improved their management options like optimum plant population, timely sowing and irrigation. This change also helped improving system productivity (yield of both cotton and wheat) as some early maturing Bt hybrids allowed timely wheat sowings. However, labour costs and cost of inputs including seed have risen faster than the yield improvement. Labour cost will keep rising faster than expectations because manufacturing and other economic activities are sending jobs in all directions. Mechanization of sowing, weeding, and even harvesting will require focused attention. Since pest resistance has been the main driver for the introduction of Bt cotton, all out efforts are needed that can help tracking future resistance development against Bt cotton also.

Farmer in this district also cater to the demand of rice and the district as a whole has a significant portion under rice-wheat cropping system (RWCS). This district has more stake as far as RWCS is concerned. The problem of summer rice and excess use of water has to be solved through productive approaches and recommending technologies which can help displacing summer rice and also conserve resources. Intercropping under bed planting system and zero-tillage are most viable technologies for conserving resources and for multiple land use, especially in the Tohana block of this district.

Here again the interest of farmers have to shielded by improving the efficiency of inputs like water, energy, labour and nutrients. Some of resource conserving technologies like zero tillage and laser land levelling are finding favour with farmers. The productivity growth rates of cotton and wheat had slowed but now growth has started picking up due Bt cotton in cotton and due agronomic management in wheat. This productivity growth of 4%/year during the 11th plan will be achieved by integrated crop management strategies in both cropping systems.

Fatehabad district can become leader in high tech horticulture because farm sizes are relatively larger than other districts and farmers can always some portion of their land for

horticulture crops. Fatehabad farmers are more enthusiastic about diversification in favour of fruit crops especially citrus like Kinnow. The newly found interest in fruit crops will thrive if farmers' interests are protected by supplying good quality planting material and marketing facilities for marketing, grading, processing and storing. Some varieties of Kinnow which mature up to late in April can also help farmers for extended marketing. The subsidy component for fruit crops so far has been very liberal but farmers who can sustain these initiatives need to be identified for still better outcomes.

Now the productivity growth rates for crops are not rising as fast as the costs of production. Farmers will have to rely too heavily on external inputs. Technologies like Bt cotton or even hybrids of vegetables and coarse grain like bajra will be at a cost. New comers in the public sector will face the problem of patents and requirement of heavy investment. Therefore, outsourcing from private or other public sector organizations have to be targeted in future.

The most pressing problem will be the creation of job opportunities within the sector. There is still a labour problem when so many within the farm families are not working. This is where subsidiary occupations have become important. There has to be some mechanism where a farmer earns some income every day. That can come through dairying, mushroom cultivation, bee-keeping, marketing, trading and custom hire services, etc.

VISION STATEMENT

Improving livelihood of rural household by rebalancing agriculture through conservation agriculture and a diversified farming system.

Priority Setting

- Soil reclamation by gypsum, FYM, Vermi-composting and green manuring through dhaincha, summer moong.
- Judicious use of problematic water.
- Popularizing RCT through seed grading, laser leveling, zero tillage, bed

planting summer moong cultivation and water harvesting.

- Use of IPM, IWM and INM in all crops.
- Adoption of agro-based vocations.
- Introduction of agro forestry and horticulture in farming system.
- Dairy management, mineral mixture feeding, breed improvement, deworming, and fodder production and preservation.
- Food preservation and knowledge up gradation of farm women.
- Employment generation through off farm activities like mushroom cultivation, bee-keeping,
- Enhancing the productivity of plants ,animals and value addition to the produce, marketing efficiency and processing ,

CHAPTER III

SWOT Analysis of the District

In order to capitalize on the opportunities and to convert weaknesses into opportunities, we have to visualize an alternate agricultural scenario from present to twenty years hence. In this endeavour, an in depth analysis of strength, weakness, opportunity and threats (SWOT) was undertaken to place the extension and technology dissemination efforts in perspective so that success can be achieved in pursuit of serving farming community.

A) Management of Agricultural Crops

Strengths:-

- i) All basic factors required for successful cultivation of major cereals are available in the district.
- ii) Fertile and productive soils with about 92 % irrigated area.
- iii) Soils and environmental factors are conducive for intensive and sustainable agriculture.
- iv) Receptive farmers willing to adopt improved form technologies.

Weaknesses

- i) Inadequate soils health management practices.
- ii) Improper and inefficient water management (especially in paddy crop).
- iii) Critical technological gaps in specific areas of crop production viz. seed treatment, balance fertilization and insect pest and disease management.
- iv) Low adoption level of FYM, green manuring, vermi-composting and crop/farm residue management.
- v) Lesser availability of quality seeds (especially hybrid seeds) of various crops.
- vi) Lack of proper knowledge and indifferent attitude of farmers towards crucial farm/crop management practices/operations.

- vii) No disincentive for excessive water and electricity use.
- viii) Erratic and uneven supply of electricity.
- ix) Lacks of market assess and market related information.
- x) Lack of fruit and vegetable marketing infrastructure and fruit processing.

- **Opportunities**

- i) Soil and agro-climatically there exists immense scope for mixed/multiple cropping with higher income and employment generations.
- ii) Vast opportunities prevail for profitable diversification of existing cropping pattern within crops and with non crop husbandry with scientific integration as per market demand.
- iii) Technologies available for sustaining natural resources health with increased efficiency of land, water and human resource.
- iv) Bridging yield gaps between average yield and attainable (successful farmer's yield) and FLDs yield
- v) Established and up coming marketing, agro-processing and ware housing/godown facilities in and around the district.

Threats

- i) Degrading soil fertility especially with declining status of potash and micronutrients.
- ii) Alarming depletion of ground water in Tohana region and rising salinity and water table in Bhattu region.
- iii) Declining factor productivity and rising cost of cultivation especially in pre-dominant cotton-wheat and paddy-wheat cropping system.
- iv) Increasing farmers' inability to invest in agricultural production system (majority being marginal and small land holders and resource poor)
- v) Rising problem of insect-pest and disease complex.
- vi) Weeds and insects thriving on common lands and government lands.

B) Management of Horticulture Production

Strengths

- i) Favorable climate for production of different quality fruits (especially citrus, ber, guava, Aonla) and vegetable crops.
- ii) Suitable soil conditions and available good quality canal water.
- iii) Long tradition of cultivating specific vegetables and nutritive fruits.

Weaknesses

- i) Poor quality saline under ground water.
- ii) Lesser availability of quality seeds and planting material in time.
- iii) Non-availability of sufficient labour especially at crucial stages.
- iv) Lack of proper knowledge of farmers of modern production, post harvest handling and marketing practices.
- v) High transportation costs.
- vi) Lack of infrastructure for fruit, vegetables and mushroom collection, grading, packaging and marketing.
- vii)

Opportunities

- i) Higher rate of energy conservation per unit time and space.
- ii) Established and up coming cold storage and processing units in and around the district.
- iii) Increasing urbanization and changing food habits with preferences towards fruits and vegetables.
- iv) Short post harvest life.

Threats

- i) Inefficient and less transparent marketing with monopoly of traders and multiple level of inter- mediatory.

- ii) Weaker post harvest management and modern marketing facilities like cold storages/chains, pre-cooling and waxing centers.
- iii) Wide fluctuation in prices.
- iv) Short post harvest life.

C) Management of Natural Resources

Strengths

- i) Rich bio-diversity.
- ii) Rich fertile soil and water availability with option to raise variety of crops, plants and animals.
- iii) Climate and soils suitable for growing quality crops.

Weaknesses

- i) Degradation of soil fertility due to continuous cropping without adequate soil health management practices.
- ii) Depleting as well as rising water tables with salinity and water logging problem.
- iii) Infestation of weeds, insect-pest and disease complex.
- iv) Lack of integrated approach on NRM, INM and IPM by the farmers.

Opportunities

- i) Unexplored bio-diversity with respect to vegetables and Fruit crops.
- ii) Bio mass available from live stock, crop and farm residue for maintaining proper soil health.
- iii) RCTs available for increased yields and productivity with enhanced efficiency of natural resources and other inputs.
- iv) Immense scope exists to tackle resources degradation through integrated approaches of NRM, INM & IPM.

Threats

- i) Injudicious and indiscriminate usage of agro-chemicals, polluting ground aquifers.
- ii) Indiscriminate usage of Irrigation water leading to alarming decline of water table (Tohana subdivision) and soil salinity and water logging (in Fatehabad subdivision).
- iii) Lack of proper soil and water testing (micro-nutrients and ground water quality) facilities in the district.
- iv) General ignorance, casual approach towards degrading soil fertility and depleting water table.
- v) Lack of diagnostic charts of nutrients deficiency.

D) Management of Animal Husbandry

Strengths

- i) Predominant rearing of world fame Murah buffalo.
- ii) Traditional expertise in cattle rearing with almost every farm house holds possessing milch animals in varying numbers.
- iii) Presence of viable milk marketing network through co-operative societies, private agencies and individual milk traders.
- iv) Ample marketing avenues of animal based products and by products in and around the district.
- v) Well established network of Government veterinary, health and A.I. facility with wide coverage.
- vi) Government backed disease management and breed up-gradation services.
- vii) Round the year green fodder production.
- viii) Fast increasing poultry enterprise with promising income generation.
- ix) Sheep, goat and pig rearing a popular enterprise among landless and poor sections of society.

Weakness

- i) High mortality and poor growth in calves.
- ii) Infertility and delayed calving
- iii) Repeat breeding and long calving interval
- iv) Low milk yield in buffalo and cows.
- v) Lack of proper management and feeding practices.
- vi) Low availability of quality fodder production
- vii) High costs of feed, medicines/vaccines and chicks
- viii) Wide fluctuations in selling prices of eggs and broilers.

Opportunity

- i) Bridging yield gaps
- ii) Growing demand for milk and other animal based products offers ready markets with higher returns and additional employment generation.
- iii) Upcoming processing and exporting firms to provide additional fillip to various animal based allied activities.
- iv) Tremendous scope to raise on farm employment, income and increased availability of organic manure by substituting area under paddy-wheat in favor of fodder crops and there by raising dairy on same area.

Threats

- i) Increasing urbanization and high population pressure on land leads to less acreage under fodder production.
- ii) Disease outbreak (even in far off places) causes the panic in consumers and producers suffer on account of crash in markets especially of poultry.
- iii) Poultry industry growth dependent on availability of maize and soya and their competitive prices as feed cost is nearly 70% of total cost with 80% of raw material comprises of these two crops.
- iv) Shrinking pasture lands
- v) Maintaining traditional sheep and goat rearing methods

- vi) Occurrence of diseases in sheep and goat

E) Management of Fisheries

Strengths

- i) Haryana fish has earned a good name in Delhi and up to far off places in West Bengal.
- ii) Overall fish production, productivity and acreage increasing steadily over years
- iii) Vast unfulfilled demand for fish with easy market accessibility
- iv) Technical, financial and marketing assistance by Government agencies for promotion of this sector.
- v) Greater people participation and generation of employment opportunities especially for landless and marginal farmers.

Weakness

- i) Weak infrastructure for fish seed production and genetic up gradation.
- ii) Lack of farmer oriented activities e.g. trainings, demonstrations, exposure visits, awareness camps etc. to update farmers' fish production and management practices.
- iii) Inadequate quality seed availability of high yielding fresh water prawn.
- iv) Poor maintenance of common or panchayat pond.

Opportunity

- i) Immense scope for fish seed (fingerlings) production to cater the needs of fish farmers of the state
- ii) Ample scope for mobilizing untapped water resources such as water logged area, saline water and soil for aquaculture.
- iii) High cattle population releasing organic manures in pounds help in growth of natural food for fish.

- iv) Greater opportunities for diversification of traditional crop fish culture and agriculture to culture of high value fish species such as magur, soil, singhora, ornamental fish and prawn.
- v) Provision of financial assistance for popularizing integrated fish farming with agriculture, horticulture, dairing, poultry, piggery and duckery.

Threats

- i) High mortality in juvenile and adult fish
- ii) Absence of any reputed centre/source of fish feed mill, fisheries management institute.
- iii) Lack of post harvest management practices by farmers
- iv) Poor facilities for soil and water sample testing, disease diagnosis and post harvest infrastructures.
- v) High water charges (increased from Rs. 40/2500 feet to Rs 250/2500feet)
- vi) Recent amendments in Panchayat Act related to reducing lease period of 10 years to 3 years (as no long term investment of worth would be feasible for lease holder).

CHAPTER IV

Development of Agriculture Sector

4.1 Introduction

Agriculture is the core sector of Fatehabad district's economy with nearly eighty seven percent of the geographical area under plough. The farmers harvest different crops of food, fodder and commercial value with 192 percent of cropping intensity. More than sixty percent of work force is directly engaged in farming with a sizeable percentage working as artisans and allied agro-industries (medium, small and cottage) workers.

4.2 Land use

The average net area sown in the district over preceding three years is about 2.19 lac ha with little scope for further expansion (Table 2). The forest cover and land under pastures is significantly less than what is optimally required. Cultivable waste land is far less (if brought under plough) than the land which is being converted to non-agriculture use .. With negligible scope for expansion of cultivable land, the average size of holding is shrinking with increase in population. The average size of holding as per 2001 census stands at 2.31 ha which might have gone further down over these years. The distribution of land is also highly skewed with large majority of farmers (nearly 64%) having small ownership (nearly 28%) of land with less than 2.0 ha size of holding and a tiny minority of farmers (3.6%) owning big chunks (nearly 15.15%) of land having more than 10.0 ha of average holdings (Table 4). However, the number of enlarged operational holdings is on the rise in the district.

Table 2: Land utilization Statistics (preceding 3 years average) Area in ha)

Taluk	Geographical area	Forest Area	Land Under Non-agri. Use	Cultivable waste	Permanent pastures	Land under miscellaneous tree crops and groves	Current Fallows	Other Fallows	Net sown area	Gross cropped area	Cropping intensity (%)
1	2	3	4	5	6	7	8	9	10	11	12
Fatehabad	67959	-	5734	2697	-	140	2697	-	59528	108634	182
Ratia	53160	-	5419	1926	-	25	1926	-	45623	88135	193
Bhuna	39467	-	4231	459	-	95	459	-	34727	61308	176
Bhattu	36029	-	2549	742	-	104	742	-	31955	57132	178
Jakhal	15289	-	1289	559	-	3	559	-	13244	26201	197
Tohana	40370	-	3490	2756	-	-	2756	-	34124	64494	189
Total	252274	-	22712	9139	-	367	9139	-	219201	405904	185

Source: Deptt. Of Agriculture

Table 4: Land Holdings (Agriculture Census 2001)**(Holdings in numbers and area in ha)**

<i>Taluk</i>	Marginal Farmers		Small Farmers		Semi-med. Farmers		Medium farmers		Large farmers		Total	
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
<i>Fa tehabad</i>	8400	4355	5280	7467	5520	15556	4080	23645	720	11202	24000	62225
<i>Ratia</i>	6375	3313	4005	5680	4187	11833	3095	17986	546	8520	18208	47332
<i>Bhuna</i>	4743	2466	2981	4228	3117	8809	2304	13390	407	6343	13552	35236
<i>Bhattu kalan</i>	4515	2344	2838	4018	2967	8370	2193	12722	387	5926	12901	33480
<i>Jakhal</i>	1351	5349	1158	4585	772	3056	386	1528	193	764	3860	15283
<i>Tohana</i>	9047	11753	7756	10076	5170	6716	2585	3358	1292	1679	25850	33582
<i>Total</i>	34431	29580	24018	36054	21733	54340	14643	72629	3545	34434	98371	227138

ha –marginal farmers, 1-2 ha- small farmers, 2-4- ha semi-med. Farmers, 4-10 ha- medium farmers and more than 10 ha-large farmers)

Source: Deptt. Of Agriculture

The gaining in size of operational holdings may get momentum with major opportunities arising in non farm, agro-processing, agro-trading and retailing sectors in and around the district with skill up gradation of the rural youths. As of now the tiny uneconomical holdings, those of absentee landowners, are adding to the augmentation of operational holdings. Vertical expansion of cultivation with multi-cropping and wide scale adoption of non-land enterprises (or using comparative less land) is only viable option left to farmers. For this, capacity building, skill up gradation and entrepreneurship development programmes are being recommended in the plan as shown in recommended interventions in the district (Table 4.2). At the same time introduction of new crops (e.g. summer moong, short duration vegetable crops etc.), multi cropping, mixed cropping with emphasis on better resource and crop management are proposed here through varietals, INM, IPM and other demonstrations on comparatively greater scale along with the development of farmers diagnostic handbook.

Soil and Water Resources Management

The neglect of composting, imbalance and non-judicious application of nutrients and chemicals, intensive cultivation of paddy-wheat, cotton-wheat and vegetable crops over years have started taking its toll on soil and water resources of the district. The majority of the soils in the district are low in organic carbon, available nitrogen, phosphorous, manganese and zinc. Studies/ surveys conducted by KVK and ICAR reports are indicating the increasingly declining status of sulphur , manganese and zinc, which are affecting the production and productivity of the crops as well as animals in the district. A sizeable portion of land in the district especially in Bhattu block is affected by salinity and/ or alkalinity along with the problem of water logging. As far as ground water resource is concerned the good quality water is 31.39 per cent and marginal water is 17.82 per cent . District Fatehabad is having nearly 92 percent of its area under irrigation by both the canal as well as the tube wells. The area under tube well irrigation is increasing at a much faster pace than the increase in area by canals over past years, however, there remain the problems of irregular and insufficient water supply by canals and erratic power supply to the tube wells even at crucial stages of crop production.

The problem affecting the tube well irrigation in Tohana subdivision is of alarmingly depleting water table with exorbitant cost to farmers. The bore wells are becoming defunct and farmers are installing submersible pumps which costs much more than bore-wells. Again in most of this region, after a certain depth, the ground water is reportedly not of good quality. The problem with tube wells in Fatehabad subdivision is of shifting of bore well to some other place after a certain period as the tube wells become dry due to shortage of quality ground water in the tube wells cavities. This water when applied non-judiciously over a period of time causes salinity and brings down productivity.

The two blocks viz. Tohana and Jakhal having good quality underground water are facing the problem of depleting water table (reaching to an alarming stage). The remaining four blocks of the district namely Fatehabad, Ratia, Bhuna, Bhattu Kalan where ground water is comparatively of poor quality are facing the problems of rising salinity. The conjunctive of knowledge and technology for management of land and water resources are the first and important tool for raising productivity to the potential level and attainable levels. Thus, both of the regions are in dire need of corrective measure such as reclamation and development of salt affected soils, rain water harvesting, and sub-surface water drainage system along with conjunctive use of available water for improving health of water resource in the district with increased water use efficiency through propagating different water conservation techniques. Due attention has been paid towards these major problems of the district in C-DAP. Special projects on soil health maintenance and ground water recharging are proposed. To tackle the problem of non-judicious use of fertilizer-chemicals (ignoring the desired ratio and application of needed micro-nutrients) site and crop specific INM demonstration (Table) or proposed along with educating farmers on RCTs and other related issues. Special emphasis has been given towards development of land and water use model on Panchayat Land / common land for training and demonstration in each block for augmenting agriculture and allied sector development in the interest of the country in matter of conservation of solar energy for fodder, food and fuel.

4.5 Major crops and varieties

Agro-climatically a number of crops can be grown in Fatehabad district but major portion of cultivable land is occupied by wheat, Cotton, paddy, guar, sugarcane, bajra and gram(Table 2) The significant area shift towards these crops reflects their respective profitability and ease with which the crops can be cultivated as per land suitability. Some other crops which can be equally profitable and easily adjusted in existing cropping pattern are being ignored by farmers on account of lack of proper knowledge, risk, uncertainty and poor yields. These existing crops and varieties are mostly been cultivated without proper care for suitable crop-rotations and other organic and non-cash practices which help in resource conservation, control of diseases, insect-pest and weeds, lowering cost of cultivation and stabilizing yields. Farmers are also sowing some non-descript varieties and varieties not recommended/suited to this region which is certainly a factor for lower productivity. All these issues are proposed to be tackled in the plan through conducting trainings, demonstrations, and other extension activities mentioned under recommended interventions for the district.

Table-2

Crops	Varieties
Wheat	PBW-343, WH-711, PBW-502, Raj-3765, C-306
Paddy	Pusa-1121, Sarbati, Pusa-1, HBC-19, CSR-30, Pusa 10
Sugarcane	COH-119, CO 89003, COH-110, COS-767 and CO-96268
Jowar	Local
Arhar	Manak, Paras
Raya	R.H. 30, T-59, (RH-8812)
Bajra	Private by hybrids
Berseem	Muskawi HFB-600
Cotton	BT Cotton
Maize	HHM-1
Barley	BH-393, Local

4.6 Input Management

Proper input management holds the key to production and productivity of the crops. In the face of rising cost of inputs, declining factor productivity and diminishing farm profitability emphasis will have to be on the efficient and judicious use of improved seeds, integrated nutrient management, integrated weed and pest management to accelerate agricultural growth. At present, there exists a big gap between the actual productivity and the attainable/ potential productivity of the crops in the district. Proper input management is imperative to fill this gap. One of the most critical inputs is quality seed. Another aspect is of seed availability in the district which is badly affected by infrastructural non-availability especially of any seed farm at block/ district level. The government agencies assure the supply of different quality seeds during each season but the demand for quality seed always remain more than its supply especially through Government agencies. The private sector should be welcomed in this area to ensure availability of quality seed and increased seed replacement rate. The most important crops of the district paddy and wheat are having only 15 and 18 per cent of seed replacement (Table 3)which is recommended to be at least at 33%. So is the case with other important crops of Jowar (17%) and sugar cane (10%). The availability of seed and its enhanced replacement can be ensured by involving farmers in seed production process on a large scale with active help from public and private sector. Special projects for production of quality seed of wheat and paddy is being submitted in the plan.

Table 3 : Planning of Agriculture Inputs in the Ditricit – Seed

Sr. No.	Name of the Crop	Area under Crop (ha)	Present SRR %
1	Wheat	177591	18
2	Cotton	91137	90
3	Paddy	70243	15
4	Mustard	13320	20

Source: Deptt. Of Agriculture

Fertilizer is another crucial input for the cultivation of present day regime of high yielding varieties/crop production. There is an effective distribution system for fertilizers in the district right up to the village level. The farmers are well aware but not educated enough about the balanced fertilizer-nutrient usage in different crops. They are concentrating mainly on application of nitrogenous, phosphates and zinc fertilizers whereas the deficiency of potash and micro-nutrients is affecting the yield and productivity of crops in most parts of the district. There should be the facility of testing micro-nutrients and water quality in any of these labs. Farmers also need awareness regarding usage of potash and micronutrients for enhanced productivity with quality without affecting soil health. For facilitating potassic and other micro-nutrient application the supply and distribution of these inputs is to be ensured in time. Location specific integrated nutrient management, bio fertilizers, FYM and vermi-composting, farm residues management etc. are to be popularised for wider adoption under the plan.

The crop diseases, pests and weeds are other hindrance in achieving optimum yield levels for all major crops in the district. The scrutiny of insect- pest, diseases and weed control measures being adopted by the farmers reveal gross negligence on part of farmers. The improper management of these control measures often results in to increased cost of cultivation without corresponding increase in yield and quality, increased resistance and soil and water contaminations. The farmers are depending more and more on chemical control with higher doses (or more concentrated form) of chemicals. Urgent steps are required to be taken for promoting integrated measures for control of insect/pest, disease and weeds control which are in tune with sustainability and profitability without enhancing cost. To achieve the recommended rate of seed replacement, number of varietal demonstrations (of suitable/preferable varieties/crops) is proposed in table . To encourage farmers on quality seed production and ensured availability near to them special projects are being proposed in the plan. Other extension activities like trainings are also proposed for their capacity building in producing quality seeds.

Proper management of other crucial inputs of fertilizer-nutrients and agro-chemicals is essential for increased yields and productivity while maintaining natural resource's health. Programmes for educating farmers (Table 4.2 ,4.3) planning for soil testing , IPM

and INM demonstrations (Table 4.4,4.5,4.6, and 4.7) and farmers field schools (Table 4.8) are proposed in the plan.

Numbers of farmers are willing to opt for organic farming who shuns the use of chemicals and fertilizers. Keeping in view the market opportunities, better management of bio-mass, deteriorating soil health and integrated approach of farming, this can be a better option for willing farmers in the district. Besides extension activities establishing well equipped soil and water testing lab, seed and fertilizer testing facility, agri-poly clinics and organic produce certification facilities can go a long way in the development of this sector. For development of this concept the increased acreage is being proposed to bring under organic farming under field and vegetable crops. Here, it is suggested that a certification lab for organic produce needed to be established in the region as the trends are showing increased interest of people towards organically produced products. Through, the organic farming component is being tackled by Horticulture development (especially under NHM programme on a relatively larger scale) the training programmes are kept under this plan in Table 6.1 and 6.2 .

4.7 Farm Mechanisation

The management of agriculture production system essentially involves effective management of timely completion of production operations. The use of mechanical power is thus becoming indispensable for making an optimal use of other resources and timely completion of various farm operations. Earlier the farm mechanisation has been essentially a tractoarisation process in Fatehabad district. However with the introduction of various other farm equipment, the number of threshers, Rotavator, Zero-till machine, straw ripper, harvester etc are on the increase in district as shown in table. In spite of the increased number of farm machinery and implements there are greater scope of sustainable productivity enhancement of field crops through more extensive use of the existing as well as other machinery like laser level, bed planter etc. To meet the future demand of agricultural machinery (especially the costly one) these should be substantially cheap and affordable for even small farmers either by purchase or by custom hiring.

Machinery available in the district

Table 4

Name of Improved Farm Implement / Equipment / Machinery	Nos.
Tractors	13569
Harvester	476
Thresher	5551

A special project on laser land leveller for the district is being submitted keeping in view its importance in increasing crop productivity and efficiency of other inputs including water.

4.8 Special projects/programmes on-going in the district.

There are no special projects/ programme being implemented in Fatehabad district by Agriculture or any line departments. However the details of the schemes being run in the district are mentioned below.

AGRICULTURE		
Sr. No.	Name of the scheme	Sector
1.	Macro Management Mode (MMM)	Central
2.	Integrated Scheme of Oilseeds, Pulses, Oil palm & Maize (ISOPOM)	Central
3.	Mini Mission-II of Technology Mission of Cotton (MM-II of TMC)	Central
4.	Accelerated Maize Development Programme (AMDP)	Central
5.	Generation of Rural Employment (GRE)	Central
6.	National Programme for Bio-Gas Development (NPBD)	Central
7.	Sugarcane Based Cropping System (SUBACS)	Central

8.	ATMA	Central
9.	NFSM (Pulses)	Central
KRISHI VIGYANA KENDRA		
1.	Farmers/ field staff trainings & other extension activities	Central
2.	Conducting FLDs, OFTs & adaptive trails	Central
3.	Testing and revalidation of farm technology	Central
4.	Seed multiplication	Central
5.	Soil testing & diseases diagnostic services	Central
6.	Survey/ studies on different farm related aspects.	Central

Existing Institutional Mechanism

The present institutional mechanism in Government sector is centralised in nature with Top-down approach. This approach focuses on individual commodities/enterprises rather than on a holistic/ integrated approach. The involvement of stakeholders is rather restricted in this ad-hoc mechanism where farmers are considered as receivers of benefits rather than as responsible persons who can influence the productions process. The public extension system is supply driven rather than demand driven.

The institutional mechanism and conceptual frame work of Government sector extension is being gradually transformed under the aegis of Agricultural Technology Management Agency (ATMA) in the district. The impact of this transformation is yet to be seen in the actual working of different Government departments and others involved in it.

4.9 Constraints analysis and Recommended Interventions for Development of Agriculture sector

The yield gap analysis of major crops and enterprises was completed by KVK resource team by identifying different farming situations under which a crop or an enterprise is being grown under each AES in the district. The study of the existing practices was followed by identifying critical gaps by comparing the existing practices being adopted by the farmers with recommended practices. The factors and/ or constraints leading to the

gaps were arrived at before finalizing the strategies along with approaches and methodology to overcome the constraints and bridging the gaps. Thereafter the performance indicators and sustainability output are indicated to ensure time bound action and impact assessment. Afterwards the sustainability and gap analysis issues were sorted out in a log frame summary indicating proposed mode of action, collaborations/targets along with the costs involved in addressing the issues critical for increasing productivity with sustainability.

Sustainability issues and gap analysis of productivity of different crops and resources

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<i>I</i>	<i>Paddy</i>					
I	Low adoption of seed treatment	Less awareness, poor management, no proper sowing schedule	To popularize practice of seed treatment for maintaining crop health.	Educating and Motivating farmers on its importance and adoption through demonstrations and trainings.	Entire district with no exception in seed born diseases and termite affected areas.	Productivity growth on sustainable basis.
ii	Low plant density	Drudgery of transplanting operation, hired labour, non-availability of labour	Introduction of paddy transplanter under zero-tillage and/or under unpuddled situations, direct seeding in unpuddled situation, varieties that can compete with weeds under direct seeding	Farmers' participatory approach for evolving crop establishment techniques, availability of paddy transplanter, custom hire services for raising nursery	5% growth in area under paddy transplanter in next two years. Similarly 5% growth in area in direct seeded Basmati rice	Improvement in soil physical conditions, better soil health, less water use, less drudgery of labour, better yield of wheat after rice due to unpuddled situation or improvement in soil physical conditions
iii	Poor adoption of Potassium fertilizers application	Low awareness regarding its contribution to yield.	Awareness campaign regarding benefits of K use on yield in paddy be organized	Demonstrations and field days on application of K in paddy at farmers' field are organized.	Ten percent growth in area under potashic fertilizer use every year.	Improvement in yield and quality of produce.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
iv	Non adoption of IPM practices	Low awareness, Excessive & indiscriminate use of chemicals	Popularization of judicious use of chemicals and adoption of precautionary measures to control insect pests.	Farmers field schools, campaigns.	Ten percent growth in area under IPM every year.	Improvement in yield on sustainable basis.
v	Poor water management	Poor quality waters, flooded through out the crop season	Safe and judicious use of poor and good quality waters.	Training and demonstrations on proper water management	4 % growth in area under proper water management.	Increase in water use efficiency.
vi	Non availability of Basmati hybrids	Less number of hybrids in Basmati group, lodging in rice hybrids	Increase area under hybrids in basmati rice.	Should concentrate on evolving hybrids for Basmati rice	50% area of coarse rice should come under hybrids	Due to fear of lodging farmers use less N which is good for sustainability
vii	Labour intensive crop/ Low mechanization	Less availability of labour, high cost of paddy transplanter	Popularize use of paddy transplanter and direct seeding of paddy	Training and demonstrations on paddy transplanter	5 percent growth in area under paddy transplanter and direct seeding paddy every year.	Reduction in dependency on labour.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
viii	Un leveled field	Lack of proper knowledge regarding need and importance of leveling and high cost of laser leveler	Introduction and popularization of laser leveler	Demonstration and exposure visits	Ten percent growth in area under laser leveler use every year.	Increase in water use efficiency and improvement in yield
B	Wheat					
i	Lesser adoption of seed treatment	Termites, fungal diseases like loose smut, flag smut and Karnal bunt	To popularize practice of seed treatment for maintaining crop health.	Educating and Motivating farmers on its importance and adoption through demonstrations and trainings.	Entire district with no exception in seed born diseases and termite affected areas.	Productivity growth on sustainable basis.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
ii	Poor yield in paddy-wheat rotation due to delayed sowing	Delayed harvesting of Basmati rice, excess/untimely rains	Zero tillage, short duration varieties of rice, reduced duration of Basmati rice, direct seeding of Basmati.	<p>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.</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>	50% area upto 15 th Nov. areas to be covered include whole coarse rice and 50% Basmati rice.	<p>Zero tillage will help :</p> <ul style="list-style-type: none"> a) Improving soil health including soil biology b) Improved environment c) Less water use d) More productivity e) Less problem of <i>P. minor</i> & decreased use of herbicides f) Reduced cost of cultivation g) Facilitates sowing under high soil moisture conditions

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
iii	Nutrient mining & increased incidence of multiple nutrient deficiencies	In RWCS, average N use ranges from 160-180 kg/ha and average P use is 57 kg/ha. Recommendation is 5:2:1 not 4:2:1	Introduce more organic manures, green manure, more residue retention on surface, use of site specific micro-nutrient, use of N in three splits and use of first split before 1 st irrigation, integrate conjunctive use of organic and inorganic sources of nutrients generate fertilizer recommendations based on the principle of site specific nutrient management. The optimal use of existing (indigenous) nutrients coming	Experimental research in different cropping systems, relook at soil test values, change in the recommendation of practice	Whole rice-wheat cropping system, use of more fertilizers in low productive blocks	The residue retention will help improving soil productivity, improved water permeability, decreased losses of nutrients

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
			from soil, organic amendments, crop residue and irrigation water. Apply fertilizer to fill the deficit between crop needs and indigenous supply. Management of pest diseases and weed problems through more appropriate nutrient management.			
iv	No variety to tolerate terminal heat	No variety to tolerate terminal heat, short duration variety produces less yield	Survey and identify high temperature tolerant variety	Popularization of identified varieties.	80% area should be covered under such varieties.	Improvement in yield.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
v	High incidence of weeds	<p><i>Phalaris minor</i> seriously affects wheat yields in rice-wheat cropping system.</p> <p>Complex weed flora seriously affects wheat yield in non-rice wheat cropping system.</p> <p><i>Phalaris</i> resistance will become a major problem and needs immediate attention for ecological solution. We must delay or avoid resistance.</p>	<p>Improve the efficiency of existing herbicides.</p> <p>Introduce new herbicide</p> <p>Capacity building for spraying techniques.</p> <p>Ecological approached including zero-tillage crop rotation.</p> <p>Monitoring of resistance build up.</p> <p>Germplasm management for competitive varieties</p>	<p>District level strategic plan for the management of <i>Phalaris minor</i> integrated. Capacity building of extension agencies and farmers for appropriate spraying techniques. On farm demonstrations of new herbicides</p>	Entire district	Anticipated economic benefits are increased profitability, increased yield and increased food security.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
C	Raya					
i	Non availability of frost resistant varieties	Loss in yield due to frost in winter	Survey and identification of frost resistant varieties.	Popularization of identified varieties and frost escaping management practices.	Entire district may be covered.	Better utilization of resources.
ii	Poor fertilizer management or no sulphur application & no basal use of fertilizers	Grown on marginal lands, fear of risk, No phosphatic & sulphur containing fertilizer application, no green manuring	Educating farmers on the importance of sulphur use and basal dose of fertilizers and its effects on yield enhancement.	Demonstration and field days.	20% growth in area every year.	Improvement in yield on sustainable basis.
iii	Poor disease and insect management	Low awareness, increased incidence of painted bug	Making farmer aware.	Trainings , demonstrations	10 % growth in area every year	Higher yield.
D	Sugarcane					
i	Late planting after wheat harvesting	Planting after wheat harvesting,	Emphasis on autumn and winter sowing of sugarcane may be given.	Trainings, seminars, demonstrations, gothis.	20% growth in area every year.	Better returns with better utilization of resources.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
ii	Poor plant population & lack of mechanized planting	Less quantity of seed used, faulty method of cane planting , poor germination , lack of mechanization	Educating farmers on use of optimum seed rate and reduce drudgery of sowing operation.	Encourage the use of cane planter and optimum seed rate through training , demonstrations and gyan diwas.	10% growth in area every year.	Optimum plant population to get targeted yield.
iii	Low adoption of INM practices	Lack of awareness regarding use of K & Zinc contribution on yield , poor quality organic manure	Emphasize the need of FYM preparation in pits and use of K and zinc in getting higher yield of sugarcane.	Farmers participatory approach	10% growth in area under INM in sugarcane every year.	Improvement in water and nutrient holding capacity of the soil.
iv	Low adoption of IPM	Termite , root borer, top borer, shoot borer, pyrilla attack is more	Seed treatment with insecticides , fungicides, bio agents and bio fertilizers	Awareness through demonstrations , campaigns , trainings , field days, gothis.	10% growth in area under seed treatment in sugarcane every year.	Improvement in yield on sustainable basis.
V	Poor adoption of intercropping	Lack of mechanized crop establishment.	Use of bed planters for sugarcane based inter cropping of baby corn , maize, raya, gram and vegetables.	Farmer's participatory approach.	20% growth in area under sugarcane intercropping every year.	Multiple land use, getting more with less.

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
E	Arhar					
i	High incidence of pod borer	Problem in doing spray due to more height of plants	Adopt spray schedule to control pod borer	Training result & method demonstrations	10% growth in area under control of pod borer every year	Increased yield
ii	Less use of phosphatic fertilizers & bio-fertilizers	Grown on marginal lands, farmers do not use fertilizers due to uncertainty of the crop	Causing awareness regarding the role of phosphatic and bio fertilizers in yield increase	Trainings, demonstrations, field day	20% growth in area every year	Increase in productivity
iii	Non availability high yielding, short stature and short duration varieties	Non availability of high yielding , short stature short duration variety ,Low yield, low income per unit area,	Use of bed planters for intercropping of maize and moong in arhar	Farmers participatory approach	10% growth in area under inter cropping every year	Multiple land use Increase in profitability

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
F	Bajra					
i	Less dose of fertilizer application	Fear of loss, lack of awareness & finance ,less productivity	Awareness regarding use of fertilizer on increase in crop yields	Trainings Demonstration, field days	20% growth in area under fert. Use every year	Increase in productivity
ii	No proper weed managemen t	Lack of mechanization in weed control, no post emergence weedicide available,	Educating farmers on the use of chemicals for the control of weeds	-do-	10% growth in area every year	Increase in productivity
iii	Intercroppi ng		Motivation of farmers to adopt intercropping of guar in bajra for higher return	Demonstrations, trainings, seminars	10% growth on area every year	Multiple land use

S.No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
G	Fodder crops					
i	Less use of fertilizers particularly phosphatic fertilizers	Lack of awareness regarding fertilizer requirement of fodder crops like sorghum , barseem, oats and maize.	Educating farmers on effect of fodder produced without P fert. Application on yield and animals health	Farmers participatory approach	20% growth on area every year	Increase in yield, improvement in animals health
ii	Non availability of improved variety and quality seed	Non availability of high yielding varieties of sorghum and non availability of quality seeds	Multiplication of quality fodder seed of approved varieties	Individual farmers, concerned dept. and seed certification agency should produce and multiply quality seed	Per block 5 villages should be selected as fodder seed village	Increase in fodder yield, milk yield
iii	High incidence of grass hopper`	Lack of knowledge regarding grass hopper control measures	Campaign on control of grass proper on community basis at breeding places	Campaign	Entire district be covered	Higher quality fodder yield

Closing the gaps for realizing the vision

Activity Output Matrix				
Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
1. Water management (Depleting and rising water table)	Deficit irrigation increase water use efficiency.	Deficit irrigation for 15 days in July or August will be tested for basmati rice.	KVKs & DDAs will jointly lay out demonstrations in ten hectares	Demons. proposed
	Keeping 80 per cent area under basmati rice.	Economics of basmati rice in favor of farmers will be ensured through technological interventions and policy frame work.	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.	Survey and economic analysis proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	Testing of high yielding basmati varieties	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	DDAs will demonstrate and KVKs will collect yield data on successful demonstrations	Varietal trials proposed
	Salinity/sodicity stress mitigation at farmers' fields	Green manuring and gypsum use. Tolerant varieties.	Subsidy on gypsum (@ 75%) and its availability will be ensured. Tolerant varieties like CSR-30 will be evaluated with other candidate varieties.	Demonstration on green manuring and gypsum proposed in plan.
	Water logging and secondary salinization	Bio-drainage through tree plantation.	ASCO and DDAs will ensure the characterization of water logged areas and plantation of useful tree species.	Project on drainage is proposed.
	Water harvesting and recharging	Construction of water harvesting structures near catchment area of drain, panchayati/ shyamlat/ farmers land.	DDAs/concerned departments in consultation with KVKs	Project on water harvesting proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	Watershed development in rainfed areas	Sprinkler/drip irrigation after creating facility of community ponds.	DDAs/concerned departments in consultation with KVKs	Project proposed.
	Utilization of brackish water.	Alternate/conjunctive use of water.	DDAs/concerned departments in consultation with KVKs	Demonstrations proposed.
	Ground water testing for nitrate and sulphate contamination	Survey of marked sites for nitrate and sulphate contamination Characterization of nitrate and sulphate contaminated areas.	DDAs/KVKs will conduct survey and identify the areas of high nitrate and sulphate containing waters.	Survey for study of ground water quality proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
<p>2. Management of salinity & alkalinity</p>	<p>Long term sustainability of different crops will depend on management of salinity and alkalinity in the system as a whole rather than commodity crops</p> <p>Avoid irrigation with brackish water in drought years because it leads to secondary salinity; wherever available make conjunctive use of water. Tolerance of current and improved varieties to salinity and sodicity needs further investigations.</p> <p>Work is also needed to adapt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability, profitability and yield</p>	<p>Rice-wheat, bajra-wheat, pulses-wheat, cotton-wheat will be studied for salinity/alkalinity buildup from life saving irrigation given in the kharif season.</p> <p>The yield of Rabi crops will be recorded for farms where farmers have given variable number of irrigation with brackish water in kharif season.</p> <p>The reclamation of sodic soils and waters through gypsum will be done.</p>	<p>Deptt. Of Agriculture/ KVK</p> <p>Survey and soil sampling will be done by DDA and KVK.</p> <p>Demonstrations will be laid out by DDA in collaboration with KVK</p> <p>Demonstrations will be laid out by DDA in collaboration with KVK and supply of gypsum may be ensured by DDAs</p>	<p>Survey proposed.</p> <p>Demonstrations proposed in plan.</p> <p>Demonstrations proposed in plan.</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
3. RCTs				
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"> ❖ Assemble district level data and use them for bio-physical and socio-economic characterization using GIS. ❖ Evaluate the concept for ecological intensification of cereal systems. ❖ Improve agronomic efficiency of nutrients. ❖ Improve recovery efficiency of nitrogen ❖ Improve crop water productivity and irrigation water productivity for a system as a whole ❖ Improve biological activity in the soil. 	<p>Monitoring of farms where farmers have practiced zero-tillage for more than five years.</p> <p>(10 ha)</p> <p>KVKs & Scientist from main campus/research station.</p> <p>KVKs & Scientist from main campus/research station.</p>	<p>Demonstration and long term trials will be laid out by KVKs at farmer's field.</p> <p>Deptt. Of Agri. will ensure visit of farmers at demonstration sites.</p> <p>KVKs & Deptt. Of Agri.</p>	<p>Demonstrations proposed.</p> <p>Exposure visit proposed.</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	<ul style="list-style-type: none"> ❖ Reduce energy budget for rice-wheat cropping system. <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>			
ii) Bed Planting	<ul style="list-style-type: none"> ❖ Technical and financial constraints will be studied to arrive at impediments that stand in the way of adoption of bed planting. ❖ New scientific knowledge of its success in water log situation will be evaluated. ❖ System level integration through multiple land use will be evaluated and accelerated to get full benefit from this technology. ❖ This system will follow different pathways for system-level changes leading to ecological intensification through inter-cropping. 	Dual purpose virtues of technology will be demonstrated in inter-cropping based system approach through University and State department.(10ha)	DDAs	Demonstration proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	<ul style="list-style-type: none"> ❖ Will target, high yields, high profits and high resource efficiency (water, energy, nutrients, labour through improved management solutions). ❖ Permanent raised bed system would be evaluated to arrest rate of ground water decline due to less use of ground water. <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>			
iii) Direct Seeding of rice	<p>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</p>	<p>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)</p>	DDAs	Demonstrations proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	technology in basmati rice. The window between wheat harvest and rice seeding will be utilize for green manuring and then retaining the residue on the surface.			
(iv) Alternate wetting and drying	1. 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 basmati 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.	DDAs	Demonstrations proposed.
(v) Laser – Leveling	Laser land leveling for water saving, land saving and improve yields in rice, wheat and sugarcane.	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 DDA	DDAs	Project proposed. 450 units x3.6 lac 1620 = 1215 lacs (75% subsidy Demonstrations proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
(vi) Green manuring	<p>The improvement in the productivity of crops</p> <p>Improvement in the soil health.</p>	<p>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.</p>	<p>DDA</p> <p>Ten per cent area will be covered.</p>	<p>Project proposed</p> <p>13600x450x5 = 306 lac (subsidy @75%)=229.5 lacs</p>
(vii) Summer moong	<p>Introduction of summer moong in the rice-wheat cropping system to discourage summer rice.</p> <p>To ensure timely transplanting of rice and to sustain the productivity of summer moong, the sowing should be preferred up to 20th April.</p>	<p>DDAs and KVKs</p> <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>DDAs/ KVKs</p>	<p>Project proposed.</p> <p>6500x1800x5= 585.0 lacs =438.75 lacs (at 75% subsidy)</p> <p>Survey proposed.</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
4. Seed production	1. Seed planning	<p>1. Participatory selection of improved variety at farmer's 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>DDA's for serial no. 1 2, and 5</p> <p>KVK's for 3, 4 and 6</p> <p>Data for all activities will be presented in the officers workshop</p>	<p>Project proposed.</p> <p>Monitoring , survey proposed.</p>
	2. Best quality seed	Seed production at farmers' field with farmer's participatory approach.	DDA	Project proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	3. Seed treatment	<p>1. Participatory selection of improved variety at farmer's 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>DDA's for serial no. 1 2, and 5</p> <p>KVK's for 3, 4 and 6</p> <p>Data for all activities will be presented in the officers workshop</p>	<p>Project proposed.</p> <p>Monitoring proposed</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
5 Site specific nutrient management	Number of split application and timing of top dress N with reference to irrigation	<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>20 lacs for strengthening one lab and out sourcing sample analysis from public/private sectors.</p> <p>Survey of doses of fertilizer application in crops proposed.</p>
	Pulses in cropping rotation	Integrated soil and crop management for rehabilitation of pulse production in rice-wheat cropping system.	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.	demonstrations will be laid out on Chickpea

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
	Crop residue	<p>Surface residue management for improving soil health.</p> <p>Improving the efficiency of nutrient utilization.</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>	Demonstrations proposed
	Bio- fertilizers	<p>Integrate chemical fertilizers with biofertilizers</p> <p>Improve the efficiency of chemical fertilizers</p>	DDAs will ensure the availability of quality bio-fertilizers	Demonstrations proposed under INM

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
6 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</p> <p>Management of leaf folder, stem borer and white backed plant hopper (WBPH)</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>	DDA	Demonstration proposed.
	<p>Biological control of pests in sugarcane.</p> <p>Agronomic management of borers in sugarcane.</p>	Strengthening of bio-control lab.	Sugar mill	Strengthening of bio- control lab at cooperative sugar mill proposed.
	Quantification, characterization and management of resistance of key pests against insecticides in vegetables.	Strengthening of quality of pesticide lab of state department.		
	<p>Diversification of wheat varieties against rusts.</p> <p>Management of wheat aphids</p>	Survey and monitoring of incidence of rust and aphids in wheat	DDA/ KVK	Survey and monitoring proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
7 IWM	<p>Spraying techniques for improving efficiency of herbicides.</p> <p>Monitoring of herbicide resistance.</p>	<p>Demonstration of candidate varieties at farmer's field.</p> <p>Survey & demonstrations</p>	DDA	<p>Demonstration proposed.</p> <p>Survey proposed.</p>
<p>8 Wheat</p> <p>Timely seeding of wheat</p>	<p>Delayed harvesting of Basmati rice, cotton, availability of irrigation, excess/untimely rains</p> <p>Zero tillage, short duration varieties of rice, reduced duration of Basmati rice, direct seeding of Basmati, Bt cotton, regulation of canal irrigation water supply</p>	<p>Extension and development agencies should 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.</p> <p>The technology meet to be further developed for other cropping systems and other crops.</p>	<p>DDAs/KVKs</p> <p>DDA</p>	<p>Demonstrations proposed.</p> <p>Campaigns, hoarding/posters, field days, district level training camps</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
9 Cotton	Quality seeds, mealy bug , less plant population, resistance development, availability of niches for carry over of pests, delayed picking and its adverse effects on wheat sowing.	DDAs will facilitate demonstrations on six niche areas proposed in column 2 Survey will be conducted for spectrum of pests	Linkage and synergies with private sector will be developed for outsourcing Bt hybrid seeds and/or developing MOU for seed production by securing parent lines. DDAs and KVKs	Demonstrations proposed.
10 Sugarcane	Late planting after wheat harvesting, lack of mechanized planting, lack 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 bed planting, testing of early varieties through KVK s and sugarmill	DDAs, Cane commissioner, sugar mills and KVKs.	Demonstrations proposed in plan.
11 Raya	Less use of sulphur, menace of Orobanche, low green manuring, attack of painted bug, frost management	Demonstrations will be laid out on each of the issues given in column 2. Frost resistant variety will be targeted for the year 2011-12	DDAs will demonstrate the virtues of green manuring and sulphur nutrition	Demonstrations on sulphur is proposed.

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/Target	Cost
12 Pulses	<p>Late maturing arhar and reduction in wheat yield, late planting of arhar , problem of helicoverpa , pod borer problem, less use of phosphatic fertilizers</p> <p>Chickpea</p> <p>Management of pod borer</p>	<p>New varieties with short maturity will be tested with the help of kvk.</p> <p>Inter cropping of other crops viz sorghum/maize or bajra under bed planting system.</p> <p>Management of pod borer will be demonstrated.</p> <p>Management strategies will be demonstrated at farmer' field</p>	<p>DDA will facilitate the demonstrations on new varieties, early planting, pod borer management and KVK will be involved in Management.</p> <p>Action DDA</p>	<p>Demonstrations proposed in plan.</p>
13.Other crops (Barley)	<p>Nutrient and weed management in Barley .</p>	<p>Demonstrations will be laid out on Barley and guar nutrition and weed management</p>	<p>DDA</p>	<p>Demonstrations proposed in plan.</p>

4.10 Recommended interventions for the district, with detailed Action Plan with costs

On the basis of the preceding study of crop husbandry in Fatehabad District in relation to the resource utilization, input management & constraints analyses, the following interventions are recommended for the development of agriculture sector. The suggested interventions will result into increased production, productivity, profitability and income generation on a sustainable basis. The recommendations for the farmers comes down to the specific usage, manner and management of resources, inputs and cultural practices which are being suggested here in. The farmers as well as the staff of agriculture and allied staff needs constant skill up gradation and capacity building. The number and nature of trainings, demonstrations, RCTs, FFSs, group formation all are recommended to be adopted by the farmers on large scale for educating themrs so that the targets of the 11th plan can be achieved.

Table 4.1 : Training Proposed for Capacity Building of Agriculture Staff (at District level)

(Phy- No. , Fin. – Rs in lacs)

Name of the Department	Year wise no. of staff to be trained											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
Agriculture	1440	8.64	1440	8.64	1440	8.64	1440	8.64	1440	8.64	7200	43.20
Cooperative & NGOs	300	1.8	300	1.8	300	1.8	300	1.8	300	1.8	1500	9.00
PRI Staff & Others	150	0.9	150	0.9	150	0.9	150	0.9	150	0.9	750	4.50
Total	1890	11.34	1890	11.34	1890	11.34	1890	11.34	1890	11.34	9450	56.7

Cost norms – Rs 600/ trainee/day

Table4.3 : Training Proposed for Capacity Building of Farmers at block level

Phy- No. , Fin. – Rs in lacs

Name of the Block	Year wise no. of farmers to be trained											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
<i>Fatehabad</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Ratia</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Bhuna</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Bhattu kalan</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Jakhal</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Tohana</i>	500	2.0	500	2.0	500	2.0	500	2.0	500	2.0	2500	10.0
<i>Total</i>	3000	12.0	3000	12.0	3000	12.0	3000	12.0	3000	12.0	15000	60.0

Table 4.2: Training Proposed for Capacity Building of Farmers at district level on different technologies

Phy- No. , Fin. – Rs in lacs

Name of technology to be transferred	Year wise no. of farmers to be trained											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
INM	1050	4.20	1050	4.20	1050	4.20	1050	4.20	1050	4.20	5250	21.0
NRM	700	2.80	700	2.80	700	2.80	700	2.80	700	2.80	3500	14.0
IPM	1050	4.20	1050	4.20	1050	4.20	1050	4.20	1050	4.20	5250	21.0
RCTs	1050	4.20	1050	4.20	1050	4.20	1050	4.20	1050	4.20	5250	21.0
Water management	700	2.80	700	2.80	700	2.80	700	2.80	700	2.80	3500	14.0
Post Harvest Management	350	1.40	350	1.40	350	1.40	350	1.40	350	1.40	1750	7.00
Credit & marketing	700	2.80	700	2.80	700	2.80	700	2.80	700	2.80	3500	14.00
Seed Production	700	2.80	700	2.80	700	2.80	700	2.80	700	2.80	3500	14.00
Farm waste and crop residue management	250	1.0	250	1.0	250	1.0	250	1.0	250	1.0	250	5.0
Vermi-composting	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
Farm Mechanization	700	2.80	700	2.80	700	2.80	700	2.80	700	2.80	3500	14.00
Renewable energy	100	0.40	100	0.4	100	0.40	100	0.40	100	0.40	100	0.40
Total	7450	29.8	7450	29.8	7450	29.8	7450	29.8	7450	29.8	35850	147.4

Table 4.4 : Varietal Demonstration in Next Five Year

(Fin – Rs. In lakh)

Name of crop	Average Area per demonstration (ha.)	Varietal Demonstration Projection											
		(Phy Area covered in ha) Fin – Rs. In lakh)											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Paddy	0.4	700	35.0	700	35.0	700	35.0	700	35.0	700	35.0	3500	175.0
Arahr	0.4	180	9.0	180	9.0	180	9.0	180	9.0	180	9.0	900	45.0
Jowar	0.4	130	6.5	130	6.5	130	6.5	130	6.5	130	6.5	650	32.5
Maize	0.4	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	250	12.5
Cotton	0.4	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Kharif. Pulses	0.4	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Wheat	0.4	1650	82.5	1650	82.5	1650	82.5	1650	82.5	1650	82.5	8250	412.5
Raya	0.4	80	4.00	80	4.00	80	4.00	80	4.00	80	4.00	400	20.0
Gram	0.4	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Barseem	0.4	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Total		2990	149.5	2990	149.5	2990	149.5	2990	149.5	2990	149.5	14950	747.5

Table 4.5 : INM Demonstrations in Next Five Years

(Phy Area covered in ha, Fin – Rs. In lacs)

Crop	Area under each demon.	INM Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Paddy	0.4	250	12.5	250	12.5	250	12.5	250	12.5	250	12.5	1250	62.5
Arhar	0.4	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	500	25.0
Jowar	0.4	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	500	25.0
Maize	0.4	100	5.0	100	5.0	100	5.0	100	5.0	100	5.0	500	25.0
Cotton	0.4	25	1.25	25	1.25	25	1.25	25	1.25	25	1.25	125	6.25
K.Pulses	0.4	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Wheat	0.4	1750	87.5	1750	87.5	1750	87.5	1750	87.5	1750	87.5	8500	437.5
Raya	0.4	250	12.5	250	12.5	250	12.5	250	12.5	250	12.5	1250	62.5
Gram	0.4	35	1.75	35	1.75	35	1.75	35	1.75	35	1.75	175	8.75
Barseem	0.4	35	1.75	35	1.75	35	1.75	35	1.75	35	1.75	175	8.75
Total		2695	134.75	2695	134.75	2695	134.7	2695	134.75	2695	134.7	13225	661.5

Table 4.6: Demonsratins on Resource Conservation Technologies

(Phy Area covered in ha) Fin – Rs. In lakh)

Technologies	Area under each demon.	RCTs Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Laser levelling	0.4	300	15.0	300	1.5	300	1.5	300	1.5	300	1.5	1500	75.0
Bed plantig	0.4	100	5.0	100	0.5	100	0.5	100	0.5	100	0.5	500	25.0
Green manuring	0.4	500	25.0	500	2.5	500	2.5	500	2.5	500	2.5	2500	125.0
Direct seeding of paddy	0.4	100	5.0	100	0.5	100	0.5	100	0.5	100	0.5	500	25.0
Summer moong	0.4	250	12.5	250	1.25	250	1.25	250	1.25	250	1.25	1250	62.5
Total		1250	62.5	1250	62.5	1250	62.5	1250	62.5	1250	62.5	6250	312.5

Table 4.7: IPM Demonstrations in Next Five Years

(Phy- Area covered in ha, Fin – Rs. In lacs)

Crop	Area under each demon.	IPM Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Cotton	0.4	30	1.5	30	1.5	60	3.0	100	5.0	120	6.0	340	17.0
Pulses	0.4	100	5.0	200	10.0	300	15.0	350	17.5	400	20.0	1350	67.5
Paddy	0.4	100	5.0	100	5.0	250	12.5	250	12.5	300	15.0	1000	50.0
Sugarcane	0.4	100	5.0	120	6.0	150	7.5	150	7.5	200	10.0	720	36.0
Total		330	16.5	450	22.5	760	38.0	850	42.5	1020	51.0	3410	170.5

Table 4.8: Farmer Field Schools covering identified critical technologies in Next Five Years

(Phy – No. of field school, Fin – Rs. In lacs)

Crop	Farmer Field Schhols Projection											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Wheat	15	3.0	15	3.0	15	3.0	15	3.0	15	3.0	75	15.0
Paddy	15	3.0	15	3.0	15	3.0	15	3.0	15	3.0	75	15.0
K. Pulses	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Cotton	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Bajra	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Jowar	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
S. Cane	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Gram	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	10	2.0
Oil Seeds	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Total	87	17.4	87	17.4	87	17.4	87	17.4	87	17.4	435	87.0

Table4.9: Group formation /Commodity interest groups formation for specific activities

Phy – No. of groups to be formed, Fin – Rs. In lacs)

Interest Group(s)	Group Formation Projection Plan											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Seed production	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	100	20.0
Water user	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	100	20.0
Organic Farming	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	10	2.0
Value addition	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Specific Crop group	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Total	57	11.4	57	11.4	57	11.4	57	11.4	57	11.4	285	57.0

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

4.10 Projected outcome and growth rate during the plan period

Table 28 a: Area, Production and Productivity Trend of Main Crops in the District (Area – ha, Production – 000 q, productivity – q/ha)

Sl. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08 (Projected)			2008-09 (Projected)			2009-10 (Projected)			2010-11 (Projected)			2011-12 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y			Y			Y			Y	A	P	Y
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Wheat	185389	8446.16	44.24						47.90			49.81			51.8			53.87
2	Raya	13724	201.55	14.68						15.88			16.51			17.17			17.85
3	Paddy	68282	4339.55	62.89			65.4			68.01			70.72			73.55			76.49

CHAPTER V:

Allied Agricultural Sectors.

5.1 Introduction

Farmers of Fatehabad district are actively engaged in cultivation of allied enterprises to meet own home requirements and subsequently for the market. The thrust in the district has been on dairy and horticulture. The farmers of this district have earned a name for themselves in kinnow cultivation. The district is also steadily making progress in other sectors e.g. poultry, fishery, goatry, piggery, bee keeping, vermicomposting etc. With rising incomes and changing diet patterns the consumption and demand for these products is increasing and the farmers of this district must come forward to seize on this opportunity of raising farm productivity and income and employment generation.

5.2 Horticulture Development

The importance of fruits and vegetable crops in improving the nutritional status and farm economy needs no elaboration. It offers excellent alternative for diversification in agriculture by ensuring balanced use of land, water and other resources for promoting sustainable agriculture besides increasing income of the farmers. Agro-climatic conditions, soil and water availability, marketing opportunities in and around the district make it suitable for growing a wide variety of fruits like citrus, ber, guava, aonla, papaya, jamun etc., all major vegetables including exotic and high value, spice crops like methi, chillies, garlic, and flowers like marigold, rose, jafri. With National Horticulture Mission (NHM) under progress and financial and technical helps available from both NHB, State government and other institutions. There is great potential for area expansion under all horticultural crops especially kinnow. The existing marketing, cold storage, post harvest and processing facilities are being strengthening in the district which will provide much more opportunities for expansion of this sector through extending market reach, value addition and post harvest management.

Organic farming is another promising area for some enterprising farmers as with

increasing awareness the market for organic agri-produce is increasing. Some of the growers have taken up organic farming on a commercial scale. They and others who are willing to opt organic farming need to be assisted with proper registration and certification with national/ international agencies. Keeping in view, the future expansion of trade in organic products, the marketing as well as technical and certification services are needed to be strengthened.

There are wide gaps in average yields and attainable yields (on progressive farmer's fields) due to variety of reasons which needs to be rectified. The first being ,the quality and availability of seeds and planting material which is not of optimum level. The present seed replacement rate for several crops (other than hybrids) is also quite low. Other important aspects affecting the quality and yields with a bearing on land and water are related to fertilizer nutrient management and chemical management in vegetable cultivation. The farmers, invariably, use imbalance fertilizers with quite higher doses of Nitrogenous fertilizers and nil or quite low (except potato) doses of potassic fertilizers without any application of other essential micro nutrients the deficiency of which are being reported with loss of yield and quality.

The activities proposed in the plan are designed to focuss on the issues having direct impact on the development of this sector. The recommended extension activities of capacity building , skill up gradation and entrepreneurship development for farmers are for developing professional attitude, exploring markets, go for value additional or associated themselves (individually or in groups) with organised trade. . The details of these activities are summarised in detailed action plan.

Mushroom Development

The mushroom cultivation is a promising enterprise having market potential with income and employment generation at a comparatively higher scale. Farmers have started mushroom cultivation on limited scale in the distt.However, owing to some diseases and pests management problems the productivity is low . Many a time the quality of spawn and compost is also a limiting factor affecting the production and productivity. The issues

affecting the productivity have been targeted for implementation in the plan through various activities to educate and aware the farmer to adopt, expand and to exploit the full potential of this profitable enterprise.

5.3 Animal Husbandry

Central to the challenge of ensuring improved livelihood and environmental sustainability the ruminant livestock-particularly buffalo, cattle and goats- that are an integral part of the district's farming system. The expanding market with rise in demand for diverse animal products and easy access to marketing are added opportunities for further strengthening of this allied sector in the district with wide network of infrastructural and support services. This sector's vast potential can be harnessed for growth in employment and income and far restoring soil health too. The emerging efficient and modern system of marketing and processing will certainly provide boost to this sector in the district.

Dairy Development

Dairy is an essential component of rural areas of the district. There is a long tradition of rearing dairy animals by the farmers in the district. Large percentage of landless families are also engaged in dairy rearing. There are 63385 numbers of cattle and 112169 numbers of buffaloes in the district as per latest cattle census (2007). The numbers of cross bred cows are 19645 which are almost one third of the number of indigenous cows. The choice of the farmers is however buffalo. As per latest cattle census the numbers of dairy animals are showing a declining trend but there is visible improvement in the stock of these animals. Enhanced farmers interest and thrust of animal husbandry department and other government departments and agencies is helpful in increasing milk yield in the district. The average milk yield of crows bred cows, indigenous cows and indigenous buffalo is 6.84 kg 4.37 kg and 5.89 kg per day respectively. There exists wide gap between the average yield and attainable yield and/or potential yield which offers scope for improvement in productivity. The existing gaps in germplasm, low reproductive efficiency, shortage of quality feed and fodder (even quality) inadequate disease management etc. can be addressed through a shift towards technology-driven livestock

production and management. The stock/germplasm gap can be tackled through A.I. services and supply of known pedigree bulls. The advanced kit is cryo scope for detecting proper time of conceiving can be great help in A.I. services. The gap of milk yield can be bridged through availability of green fodder and popularising hay and silage making addressing the mineral deficiency. The macro and micro-nutrient deficiency in soil is also affecting the productivity of these animals which is to be rectified through quality fodder production with complete fertilizer nutrient application based on soil testing/detailed mapping of soil for mineral status. The high calf mortality and other disease menace would effectively be checked by starting extensive campaigns. Malnutrition of animals especially of resource poor farmers can be tackled by providing complete feed blocks which can be prepared by using both locally available and unconventional feed stuffs. For effective disease control the veterinary services are to be strengthened by providing different improved diagnostic kits for mastitis, F& M etc. and provide mobile hospital vans for door step services to the farmers.

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

Poultry Development

Poultry farming though considered be a subsidiary occupation to agriculture yet it has established itself as one of the important independent commercial activity in the district. Climate, infrastructural facilities, easy finance and availability of ready market (Delhi) contributed favourably towards development of this activity. Over years there has been an increase in number of poultry birds (layers and broilers) however uncertainty in markets during last few years has hindered its growth. As per 2007 animal census there were 431450 poultry birds in the district and out of which 422750 and 8700 were broilers and layers respectively. There are well established backward and forward linkages for the poultry in and around the district.

There is no processing unit in the district . Though the district has one Poultry Extension centre and poultry disease diagnostic laboratory at district head quarter the farmers are unable to seek benefits from these units on account of lack of information and awareness and lack of technical staff in position in the lap. The demand for day old chick is generally being met by the private hatcheries. The farmers generally face problems on account of poultry diseases though some hatcheries provide veterinary help to their farmers. The rising feed cost is another major issue facing poultry farmers. In spite of all round developments, there is a segment of poultry sector which is unorganised and spread over in the form of small farms in villages which require efforts for exploiting the potential.

Promotion of back yard poultry

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

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

Sheep, Goat and Piggery Development

Sheep, goat and pig have an important role in the sustenance and livelihood security of a section of farmers and land less rural. The rearing of these animals is having potential for poverty alleviation with low risk. With the availability of few open pastures in the

district, sheep and goat rearing is not feasible in a big way. However, promoting small units as subsidiary to the agriculture by land less labourers and those traditionally engaged in such activities is quite feasible. The improved strains of goat & sheep with semi-intensive feeding system, parasitic control measures and promotion of good management practices can ensure healthy economic return to the farmer. Under the plan a small percentage of willing land less farmers would be persuaded to go for rearing of 2 to 4 goats (especially Barbari and/ or another suitable one). This will be low cost , no risk moderately income generating activity with nutritional security for the family. Just like back yard poultry , this activity can be under taken on a limited scale which have unexploited market potential in and around the village itself. In the past piggery had gained momentum as an important economic activity in the district but because of problems related to diseases and transportation the pace gained has subsided to some extent. With increasing urbanization, the supply of pig feed can be assured from hotels and restaurants wastes. The improvement in transportation facilities and ready assured markets in national capital of Delhi has brighten up the scope for its growth in the district.

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

Fisheries Development

Fish farming is another promising enterprise with potential of generating higher income and employment. Fisheries, being a non traditional activity has registered an impressive growth over past several years. Fish culture is being accepted by the farmers as one of the subsidiary occupation in the district. The fish farming in Fatehabad is mostly being done in village / panchayat ponds on lease. The added advantage of village pond fishery is the high cattle population of the villages. Cattle visiting village ponds (a common practices) add fertilisation in the shape of cow dung to the pond resulting in production of natural food for fish. The productivity of village pond is high and live fish is marketed. There exist wide potential for increasing production and productivity. The per ha productivity needed to be raised up to 9000 kg to 10000 kg/ ha. The bottle necks of weak

infrastructure for fish seed production and genetic upgradation , lack of extension services and recently hiked water charges and amendments in panchayat act pertaining to village / panchayat pond need immediate readdressal for putting fishing in still higher growth orbit. Different programmes/ schemes have been launched by fishery department to cater the needs of fish farmers. These activities are proposed to be strengthened under the plan for further development especially the skill up gradation, fingerling production and adoption of intensive / poly culture fish farming.

Social Forestry Development

Total forest area of the district is 237ha. There is no natural block forest area in the district. The forest are mainly in the form of strips all along roads, canals, drains, minors, bundhs and railway tracks. Forest department is involved in plantation on government , panchayat and community lands under its various on going schemes. There is no natural forest in the district , however there is potential to develop farm forestry / agro forestry in the district. The growth of agro forestry is linked with future returns to the grower after 8 to 10 years.

The farmers are to be advised on future demands , growth and the return from forest crop(s) along with the scope and possibilities of raising crops as inter/ mixed cropping with forest trees in order to enable them to make informed choices. It is also planned to promote growing of indigenous trees like Neem in the wake of likely increase in demand for neem based products and pesticides especially with increase in area under organic farming.

Training programme and other extension activities for staff of forest and other departments and progressive farmers are proposed in the plan to educate them on modern line of developing agro/ social forestry for ecology and economics.

Agro and Food Processing

Post harvest technology management and food processing have a crucial role in value addition to agriculture. In consonance with central government policies Haryana state has

also given thrust to agro and food processing with a number of policy initiations.

The establishment of Food Parks and efforts made towards contract farming are other such steps towards popularising agro/ food processing sector. In addition to the huge domestic market , the WTO agreement and opening up of international markets , the agro food processing has assumed significance and has thrown open new opportunities and challenges. Among others the big corporate like Reliance , Bharti, Pepsi, NDDDB, ITC etc. are keenly exploring the present scenario to sieze these new opportunities in the rural sector. The state of Haryana with its production capabilities, infrastructure and large consumer base provides a unique opportunity to industries in food processing sector. Besides regular food processing, health foods, value added dairy products. Fatehabad district is self sufficient in food grains production and contribute handsomely towards central pool. The farmer of the district are producing different vegetables, fruits, milk, eggs, meat, fish , mushroom and honey etc. much more than their own consumption. The status of production base of various crops / enterprises grown in the district is as under-

Sr. No.	Type of crop enterprise	Annual Production (MTs)	Produce consumed / Marketed in Raw Form (MTs)	Produce available for Processing (MTs)
1	Food grains			
i	Staple- Wheat	189000	85000	104000
ii	Paddy	225000	152000	73000
iii	Coarse cereal- Maize	160	125	45
2	Oilseeds	12000	3500	8500
3	Pulses- Arhar	8100	1000	7100
4	Fruits- Ber, Guava, Citrus, Others	2800	1600	1200
5	Vegetables	9000	5000	4000
6	Sugarcane	95000	90000	5000
7	Spices	4205	3500	705

Source: PLP Fatehabad, NABARD, Deptt. of Agriculture

There are 97 big and small processing units of varying capacity in the district. These units are mainly processing the sugarcane, wheat, rice , vegetable and fruits, pulses and milk.

The need today is to establish the proper linkages between farmer producer and processors in right earnest, more specifically in PPP mode. Farmers have to produce as per processors' / market's requirements. There should be the synergy in efforts right from production to processing till marketing and consumption. The backward as well as forward linkages have to be strengthened as per changed perspective based on market needs. The job of extension (including research) is to provide quality input and production technology for quality produce as demanded by processors and consumers.

The extension activities i.e. specific trainings and demonstrations, site specific application of fertilizers- nutrients, IPM and seed production, along with the programme of developing linkages in PPP mode, encouraging farmer to form commodity groups/ associations etc. are aimed at harvesting quality produce as per market needs for better farm return on a sustainable basis.

Farm level value addition is also proposed to be encouraged under the plan. The vast market potential of raw or partially processed or value added products existing at local level can be harnessed with little extra efforts on part of farmer – producer. The specific skill up gradation or capacity building needs of these farmers are proposed to be met by extension/ development agencies in the plan. The direct supply of several of agri produces such as pickles, pulses , ghee, khoya, paneer, eggs, dressed meet etc. to the local consumers by individual farm entrepreneur or by formation of specific self help groups are also planned under this plan.

Table 66 : Agro Processing Unit in the District (including Sugar, Milk, Silk, etc., related to Agriculture only)

Type of Agro- Processing unit	Block	No. of Processing units	Per day capacity of Agro-Processing unit(tonnes)	Produce Processed by Agro-Processing unit during 2006-07(tonnes)
Sugar Mill	Bhuna	1	2500 MT	12033
Rice Mill	Fbd.	51	510 MT	153000
Flour Mill	-do-	7	35 MT	10500
Oil Mill	-do-	27	20 MT	9000
Cotton Ginning Mill	-do-	25	200 MT	90000

Source :

Agricultural Marketing

The agricultural marketing infrastructure is fairly developed in the district with three regulated markets and 15 sub yards. The ware houses with a capacity of 235000 MT are there in the district along-with, 9 cold storage with a capacity of 600 MT. All the villages are connected with all weather roads. The district is well connected with the big market of National Capital of Delhi,Bhatinda with road network.

The marketing opportunities for dairy products are abundant in local city of Fetahabad and other towns.

Vegetables, fruits, mushroom, fish and other animal based products like egg, meat etc. are primarily marketed in the local market, though the opportunities in the Fetahabad city itself are on the rise due the rapid expansion of urban areas. In spite of huge marketing facilities, avenues and opportunities, farmers often find them selves at the receiving end in the marketing of their produces. Marketing it self is not so high on the agenda of farmers though they suffer a considerable loss in ignoring this important aspect. More than before, the efficient marketing is the key to the overall development of the farm sector now. In the wake of WTO agreements farmers have to cater to (and face the challenge of) the international market which is not possible without farmers education about modern day marketing needs and their strong linkages with firms/markets/consumers.

Market Proposals

Keeping in view the future trends a market hub is proposed to be developed in Fetahabad district especially for marketing of poultry and meat as this sector is developing fast with out proper marketing infrastructure in this part of state.

Marketing of organic produce is also channelized by educating farmers and creating facilities for certification and trading of these productsto cater to the future demands.

Extension Activities

Extension programmes are proposed to be undertaken in plan for

- Educating farmers in deciding what, when, and how much to produce and when and where to sell
- Providing marketing intelligence, e- marketing facilities and its awareness among farmers
- Establishing linkages of farmers with firms i.e. extension- farmer – market linkages through contract/ contact farming, buy back agreements, backward linkages
- Encouraging farmers to go for value addition, proper grading and packing and other such practices
- Motivating farmers to form SHGs or commodity interest groups for effective marketing

Agricultural credit

The net work and facilities to meet the credit needs of agricultural and allied sector is fairly developed in the district. The details of the banks and their branches are as follows

Sr. No.	Name of bank	No. Of branches
1	Commercial banks	45
2	Fetahabad CCB	29
3	PACS	-
4	RRB	12
5	Others	4
	Total	90

Punjab National Bank is the lead bank of the district. Haryana Government has restructured the PACSs and marketing societies to form multipurpose Cooperative Society to make them ‘Single Window Agency’ for farm sector. These are meant for providing all types of credit, agricultural inputs, services, technical know how, storage

marketing and processing. The 142 credit societies are converted into 35 rearranged PACSs.

The maximum numbers of these credit institutions are in Fetahabad block (54) where as blocks are having only 5 and 9 branches, respectively. For financing all types of agricultural activities, these credit institutions disbursed Rs. 810.57 crores during the year 2006-07. Considering the expansion of the sector, the loan disbursement target has been raised upto Rs. 1038.98 crores in the fifth year of XIth plan. Linkages between credit institutions and agriculture and line departments are well established for development of agriculture and allied sectors.

With restructuring of PACSs and increasing involvement of commercial banks in agriculture and allied sectors, the extension programmes are needed to be compulsorily broad based by involving these personnel for effective delivery.

Informal Credit Delivery System

In spite of wide expansion of the formal credit system in the country, the dependence of rural poor on money lenders continues in many areas especially for meeting emergent requirements. NABARD has introduced a novel scheme to finance such target groups through SHGs way back in 1991 where in such groups were promoted by NGOs, banks and other agencies to inculcate in them a habit of saving and thrift and have institutional credit through these SHGs.

The SHGs are considered to be best medium through which poorest of poor can have access to institutional credit. The collective right of a group overcomes the draw back of an unbankable individual.

The detail of such micro finance profile of district is as follows-

There are 1135 saving linked and 646 credit linked SHGs in the district under SGSY. The number of SHGs formed by DRDA and NGOs are 821 and 960 with saving and credit linked, respectively.

Farmers Club

There are one farmers' club in the district promoted by different credit institutions such as commercial banks, RRBs, and cooperative societies.

Farmers Welfare Club

There is one farmer welfare club promoted by department of agriculture. The capacity building, skill up gradation and entrepreneurship development programme for these SHGs, Farmers' club and Farmers' welfare club are proposed in the plan to meet their specific needs for over all development.

Sustainability issues and gap analysis of productivity of different allied sectors

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
1	Horticulture					
i	Fruit drop	Imbalance use of fertilizers, untimely irrigation, poor management, lack of pollinators	Educate farmers on proper management of fruit crops, balanced and timely application of fertilizers and organic manures and irrigation	Trainings demonstrations, and farmers field school through farmers participatory approach	15% growth in area to reduce fruit drop every year	Increase yield and profitability
ii	Increased incidence of insect-pest and diseases	Poor management, on lack of awareness, improper training pruning, contract farming	To aware farmers about preventing measures and control measures of insect-pest and diseases infestation	Training, demonstration, on proper management, training, pruning, insect-pest disease management	20% growth in area every year	Improvement in quality and yield
2	Vegetable crops					
i	Seed treatment	Unawareness, unavailability of small packing of fungicides	Educate farmers regarding benefit of seed treatment	Trainings, demonstrations, seminars, field days to make aware farmers	10% growth in area under seed treatment every year	Increased yield on sustainable basis
ii	Poor nursery management	Unawareness, poor germination	Line sowing, drenching irrigation with showers, proper application of compost in nursery	Mass campaign of nursery management through trainings & demonstrations popularise nursery raising in poly house	10% growth in area under good managed nursery every year	Quality seed lings, Increased income and saving in resources

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
iii	Lack of adoption in IPM	Lack of awareness, excessive and indiscriminate use of chemical	Variation in dose and low frequency of application based on economic threshold use of less persistent insecticides, crop rotation, synergists, use of insect pheromones and hormones. Protection and use of natural enemies. Re-introduction of susceptible pests	Farmers participatory approach, field schools, supply of pheromones, hormones to farmers	20% growth in area under IPM every year	Improved quality and yield
iv	Imbalance use of fertilizers	Excessive use of nitrogenous fertilizers, less use of organic manures and micronutrients	Educate farmers in balanced use of fertilizer importance of k, and other micronutrients and organic manure on quality of vegetables	Trainings, demonstrations, farmers field school and awareness campaigns	15% growth in area under balanced use of fertilizers every year	Improvement quality and quantity of the produce
3	Mushroom					
i	Poor quality of compost	Long method of compost preparation	Pasteurized composting on dry weight basis (subsidy)	Demonstration	5% growth in area every year	Increase in productivity
ii	Low quality spawn	No certification and testing facility	Quality spawn with proper certification from any agency	Ensure distribution of good quality spawn of farmers from reliable agency	20 growth in quality spawn every year	Increase in productivity
iii	IPM	Lack of awareness, poor management	Disinfect of reused materials used in shed, disinfect shed with fumigants, proper spray scheduling, avoid insect entry in the shed	Demonstration, trainings, Mushroom diwas and exposure and exposure visit of the farmers	25% growth in shed with IPM every year	Increase in productivity on sustainable basis

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
4	Dairy					
i.	Poor stock	Un-controlled breeding	Maintenance of herds of pure breed at Govt./ regd. Societies level, supply of quality bulls for natural inseminator, Improvement in A.I. facilities at village level. Association/ group formation of breeders its at village level. Ensure supply of kits for detecting the proper time for A.I.	Popularize benefit of the A.I. provide quality bulls to the panchayat with its responsibility of maintenance	10% village panchayats should be provided quality bulls	Improvement in breed and milk yield
ii	Imbalance feeding	Non availability of quality green fodder sound the year. Lack of awareness regarding use of mineral mixture	Educate farmers regarding benefit of mineral mixture. Cultivation of leguminous + grassy fodder should be encouraged	Ensure 6-8% of the total area under quality fodder crops. Demonstrate the impact of mineral mixture milk yield	Entire district	Improvement in health of the animals and bulk yield on sustainable basis.
iii	Repeat, Anestrous problem	Imbalance feeding, poor management practices, parasitic problems and problem of heat detection.	Ensure balanced feeding, improved management practices and control of endo and ecto parasites. Kit for detection of heat in animals would be supplied to vety hospitals. Deworming of adult animals	Farmers would be advised/ educated to adopt the use of mineral mixture, extreme summer & winter management	Entire district	Improvement in animals health

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
iv	Calf mortality	Endo & ecto parasites, poor winter management	Providing deworming facility at the doorstep with latest quality dewormer	Mass awareness adoption campaign for deworming for control of endo parasites. Awareness campaign of feed management in extreme winter	Whole of the district the calf mortality be reduced to 5% from 24% with in 5 years	Increase in animals resource
5	Poultry					
i	Incidence of infectious diseases.	Poor disease diagnostic facilities, high cost of medicines and vaccines.	Strengthening of disease diagnostic lab at district level. Providing vaccination facility at door step at subsidized rates.	Vaccination campaign for control of diseases.	The reduction of incidence in infectious diseases.	Increase in profitability.
ii	Less developed backward and forward linkages	Lack of knowledge and interaction.	To educate farmers on PPP concept. Promoting farmers' groups for developing linkages for mutual benefits.	Awareness campaign. Bringing all stakeholders on a common platform.	Group formation and linkages developed and strengthened.	Better and efficient marketing , increased farm incomes.
iii	Poor feeding and up keeping management	High cost of ready-made feeding material. Lack of knowledge.	Educating farmers on low cost, locally available feed and management practices.	Trainings, demonstrations and farmer field school through farmers participatory approach	Reduction in feeding cost and improvement in up-keeping of birds.	Increased productivity and profitability.
iv	High incidence of nutritional disorders	Lack of knowledge and availability	Awareness regarding nutritional disorders, its causes and prevention.	Extension activities, and supply at cheaper or subsidized rates.	20% reduction in nutritional disorders per annum.	Increase in egg yield and rapid weight gain in broilers.

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
6	Fisheries					
i	Quality seed	Inadequate quality seed availability, poor breed,	Ensure quality seed availability, educate farmers on seed production. Strengthening of seed production units.	Extension activities, new seed production units will be established.	20% growth in area under quality seed per annum.	Increase in productivity and profitability.
ii	High mortality of juvemine and adult fish	Lack of facilities for disease diagnosis.	Strengthening of disease diagnosis facility at district level. Creating awareness .	Trainings and demonstrations in farmers' participatory approach.	20% reduction in mortality rate per year.	Increase in productivity and profitability.
iii	Poor adoption of modern techniques of fish farming	Inefficient dissemination of technologies, less extension activities.	Educating farmers on modern techniques of fish farming. Strengthening of training facilities.	Trainings and demonstrations in farmers' participatory approach.	20% growth in area under modern techniques of fish farming per annum.	Increase in productivity and profitability.
7	Piggeries					
i	High infestation of worms	Lack of deworming	Providing deworming facility at the doorstep with latest quality dewormer	Mass awareness adoption campaign for deworming for control of endo parasites. Awareness campaign	20% reduction in worm infestation rate per year.	Increased profitability.
ii	High infestation of diseases	Lack of proper vaccination and disease control measures.	Strengthening of disease diagnostic lab at district level. Providing vaccination facility at door step at subsidized rates.	Vaccination campaign for control of diseases.	The reduction of incidence in infectious diseases.	Increase in profitability.

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
iii	Improper feeding and up-keeping	Less area under pasture, high cost of feeding materials.	Educating farmers on low cost, locally available feed and management practices.	Trainings, demonstrations and farmer field school through farmers participatory approach	Reduction in feeding cost and improvement in up-keeping of birds.	Increased productivity and profitability.
8	Sheep & goats					
i	High incidence of diseases and worm infestation	Lack of vety. Facilities, lack of proper vaccination, deworming and disease control measures.	Strengthening of disease diagnostic lab at district level. Providing vaccination, deworming facility at door step at subsidized rates.	Vaccination and deworming campaign for control of diseases and worms.	The reduction of incidence in infectious diseases and worms.	Increase in profitability.
ii	Poor stock	Rearing of animals of non descriptive breed.	Providing animals of suitable breed to the farmers.	Breed improvement campaign.	Improvement in breed.	Increased productivity and profitability.
iii	High incidence of mineral deficiency	Improper feeding, shrinking pastures,	Educating farmers on low cost, locally available feed and management practices.	Trainings, demonstrations and farmer field school through farmers participatory approach	Reduction in feeding cost and improvement in up-keeping of animals.	Increased productivity and profitability.
9	Forestry					
i	Shishem & Kikar mortality	Fungal infection	Survey and identification of causal organism.	Demonstration and trial through farmers' participatory approach	Reduction in mortality.	Increased productivity.

Closing the gaps for realizing the vision

Activity Output Matrix for Allied Sectors

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/ Target	Cost
<p>1. Vegetable cultivation</p>	<p>Non-availability of high quality/hybrid seeds specially from public sector</p> <p>Contamination of vegetables with pesticides/heavy metal</p>	<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>Injudicious use of pesticides and the use of contaminated groundwater or sewage/canal.</p> <p>Random sampling of fresh vegetables for quantification of pesticide residue</p> <p>Survey of current status of pesticide use on vegetables for recommended or un-recommended</p>	<p>DHO and University</p> <p>Regulations regarding disposal of industrial wastes</p> <p>Establishment of state designated pesticide residue lab or outsourcing the residue analysis from other private/pesticides labs.</p> <p>DHO may collect random samples and outsource the residue analysis alternate arrangement</p> <p>DHO</p>	<p>Strengthening of pesticides lab proposed.</p> <p>Demonstration proposed.</p>

Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/ Target	Cost
2. Fruit crops	Provision of nutritional gardens near/around tubewells.	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	
3. Farming system through dairy	Establishment of commercial dairy farming of 20,50 and 100 milch animals.	AHs , lead bank and KVKs will initiate action for establishment of dairies by selecting appropriate sites depending on market strategies.	DDAH	Project proposed
	Improving the infrastructure facility for procurement of milk.	The existing facilities of milk procurement will be extended in all villages.	DDAH	
	Strengthening facilities for creation of milk processing units.	Milk processing unit may be created/strengthened at district headquarter.	DDAH	
	Facilities for creation of silage and hay making	Demonstrations for economical and sustainable silage and hay making in dairies proposed in column1.	DDAH	Demonstration proposed
	Incentives for fodder crops in summer season.	Special demonstrations for maize/sorghum + cowpea fodder in rice-wheat system	DDAH	Demonstration proposed
	Creation of facilities for drinking water.	Village ponds need desilting	DDAH	
	Promotion of crossbred and buffalo in rice-wheat cropping system areas	In North-East areas, creation of dairies of crossbred cows and their management.	DDAH	

	Promotion of murrha buffaloes.	In North-West part, buffalo conservation be promoted.	DDAH	Project proposed
	A.I. and natural service through community bulls (Private Public interface)	Private Public linkage and synergies be created. Retail outlets may also be associated with productivity improvement through A.I. and natural services.	DDAH	Project proposed
	Reduction of calving period – by adopting mineral mixture feeding and balanced feeding, deworming, summer management, unestrus management, free hormone therapy for repeat breeder of resource poor.	DDAHs and KVKs will jointly demonstrate the usefulness of technologies detailed in column 2. Creation of facilities for cattle feed, mineral mixture through co-operatives.	DDAH	Project proposed
	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. Procurement of special kits like cryoscopes, mastitis diagnostic kit, foot and mouth diagnostic kit etc.	DDAH	Project proposed
4. Poultry	Low production due to poor knowledge about housing and rearing, high incident of diseases, poor quality of drinking water, non availability of quality feed and healthy chicks and unorganized marketing.	DDAH and KVK will organize trainings for better management and higher production	DDAH	Trainings proposed

Activity Output Matrix for Allied Sectors				
Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/ Target	Cost
5. Fishery	Less production of fish due to poor technical knowledge of fish farming, poor management of fish farms, poor quality of ground water and unorganized marketing	<p>Fishery deptt. will organize trainings/ demonstrations for fisheries development during the plan period</p> <p>Distt. Fishery Officer (DFO) will work to develop advance stock of 10 lacs fingerlings 50 m m size during the plan period</p> <p>DFO will get one hatchery established during the plan period for rearing fingerlings. DFO will also contact concerned departments for arranging tube well and canal water for the hatchery.</p>	Fishery Deptt.	Trainings & demonstrations proposed.
6. Piggery	Low production due to poor management, slow weight gain, lack of good quality ration/feed, less area under pastures and high incident of diseases.	DDAH and KVK will organize trainings for better management and higher production	DDAH/KVK	Trainings & demonstrations proposed.

Activity Output Matrix for Allied Sectors				
Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/ Target	Cost
7. Sheep & Goat	Low production due to poor management, slow weight gain, non availability of natural services, lack of ration/feed, less area under pastures, high incident of diseases and poor preventive vaccination programmes.	DDAH and KVK will organize training for better management and higher production DDA will make linkages with private agencies for starting facilities of marketing and availability of feed through co-operatives.	DDAH/KVK DDAH	Trainings & demonstrations proposed.
8. Bee-Kepping	Promotion of bee- keeping for employment generation	Establishment of Bee keeping units and honey processing units.	DHO	Trainings proposed Project proposed
9. Vermi-composting	Promotion of vermi-composting for employment generation and soil health improvement.	DHO/DDA/KVK will provide trainings on the efficient methods of vermicompost preparation. Financial assistance will be provided for establishment of 50 vermicompost units.	DHO/DDA	50 x30000 = 15.0 lacs

Activity Output Matrix for Allied Sectors				
Activity/Crop/Commodity	Issues	Mode of Action	Collaborator/ Target	Cost
10. Mushroom cultivation	Making availability of pasteurized compost to farmers at low cost.	Strengthening of pasteurized compost unit at HAIC, Murthal	HAIC	Project proposed
	Promoting IPM	HAIC (R&D), KVK will provide training and conduct demonstrations at farmers' field.	HAIC	Demonstration proposed
	Quality spawn	DHO/ HAIC (R&D) mushroom centre will ensure the supply of quality spawn. Strengthening of spawn lab at HAIC Murthal.	HAIC	Demonstration proposed
11. Agro-Forestry Shishem & Kikar mortality	Fungal infection	Survey and identification	DFO	Demonstration proposed

Recommended interventions

Table5.1 : Training Proposed for Capacity Building of Allied sectors Staff on different aspects covered under Plan(at District level)

(Phy- No. , Fin. – Rs in lacs)

Name of the Department	Year wise no. of staff to be trained											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
Horticulture	880	5.28	880	5.28	880	5.28	880	5.28	880	5.28	4400	26.40
Animal husbandry	120	0.72	120	0.72	120	0.72	120	0.72	120	0.72	600	3.60
Fishery	25	0.15	25	0.15	25	0.15	25	0.15	25	0.15	125	0.75
Credit institutions	100	0.60	100	0.60	100	0.60	100	0.60	100	0.60	500	3.00
Forestry	100	0.60	100	0.60	100	0.60	100	0.60	100	0.60	500	3.00
Total	1225	7.35	1225	7.35	1225	7.35	1225	7.35	1225	7.35	6125	36.75

Cost norms – Rs 600/ trainee/day

Table5.2 : Planning for Farmers Training for Capacity Building and Skill Upgradation Related to Allied fields (at district level)

(Phy- No. of trainees, Fin- Rs.in lack)

Sr. No.	Name of technology to be transferred	No of farmers to be trained and fund requirement										Total	
		2007-08		2008-09		2009-10		2010-11		2011-12		Phy	Fin
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin		
1	Seed Production	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
2	Post Harvest management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
3	Green House	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
4	Exotic Veg. Cultivation	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
5	Micro Irrigation	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
6	IPM	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
7	Rejuvenation of old orchard	40	0.16	40	0.16	40	0.16	40	0.16	40	0.16	200	0.8
8	Flower cultivation	50	0.20	50	0.20	50	0.20	50	0.20	50	0.20	250	1.0
9	Fish Farming	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
10	Agro Forestry	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
11	Credit and marketing management	150	0.60	150	0.60	150	0.60	150	0.60	150	0.6	750	3.0
12	Renewable energy sources	100	0.40	100	0.40	100	0.40	100	0.40	100	0.40	500	2.0
13	INM	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
14	RCTs	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
15	Weed management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
16	Mushroom	350	1.40	350	1.40	350	1.40	350	1.40	350	1.40	1750	7.00
17	Bee Keeping	350	1.40	350	1.40	350	1.40	350	1.40	350	1.40	1750	7.00
18	Modern dairy management aspects	1000	4.0	1000	4.0	1000	4.0	1000	4.0	1000	4.0	5000	20.0
19	Poultry management	200	0.80	200	0.80	200	0.80	200	0.80	200	0.80	1000	4.0
20	Sheep, goat and pig rearing	400	1.6	400	1.6	400	1.6	400	1.6	400	1.6	2000	8.0
	Total	4140	16.56	4140	16.56	4140	16.56	4140	16.56	4140	16.56	20700	82.8

Table 5.3 : IPM Demonstrations in Horticultural crops Next Five Years

(Phy Area covered in ha, Fin – Rs. In lacs)

Crop	Area under each demon.(ha)	IPM Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Fruits	0.4	100	1.60	100	1.60	100	1.60	100	1.60	100	1.60	500	8.00
Vegetable crops	0.4	225	1.575	225	1.575	225	1.575	225	1.575	225	1.575	875	7.875
Floriculture	0.4	50	0.75	50	0.75	50	0.75	50	0.75	50	0.75	250	3.75
Total		375	3.925	375	3.925	375	3.925	375	3.925	375	3.925	1625	19.625

Table 5.4 : INM Demonstrations in vegetable crops in Next Five Years

(Phy Area covered in ha, Fin – Rs. In lacs)

Crop	Area under each demon.(ha)	INM Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Bhindi	0.4	20	1.0	25	1.25	30	1.5	35	1.75	40	2.0	120	6.0
Potato	0.4	30	1.50	40	2.0	45	2.25	50	2.5	60	3.0	225	11.25
Cucurbits	0.4	10	0.5	10	0.5	10	0.5	10	0.5	10	0.5	50	2.25
Onion	0.4	30	1.5	35	1.75	40	2.0	45	2.25	50	2.5	200	10.0
Brinjal	0.4	30	1.5	35	1.75	40	2.0	45	2.25	50	2.5	200	10.0
Cole Crops	0.4	30	1.5	35	1.75	40	2.0	45	2.25	50	2.5	200	10.0
Total		150	7.5	180	9.0	205	10.1	230	11.5	260	13.0	975	48.75

Table 5.5 : Varietal Demonstrations to be conducted in vegetable crops in Next Five Years

(Phy Area covered in ha, Fin – Rs. In lacs)

Crop	Area under each demon.(ha)	Varietals Demonstrations Projection											
		2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Bhindi	0.4	20	0.75	25	0.95	30	1.125	35	1.3	40	1.50	150	5.625
Totato	0.4	20	0.75	25	0.95	30	1.125	35	1.3	40	1.50	150	5.625
Brinjal	0.4	20	0.75	25	0.95	30	1.125	35	1.3	40	1.50	150	5.625
Onion	0.4	20	0.75	25	0.95	30	1.125	35	1.3	40	1.50	150	5.625
Cole crops	0.4	20	0.75	25	0.95	30	1.125	35	1.3	40	1.50	150	5.625
Other veg. crops	0.4	50	1.875	50	2.375	50	2.8125	50	3.35	50	3.75	250	14.06
Total		150		175		200		225		250		1000	42.20

Table 5.6: Demonstrations on important aspects identified in the Plan in allied sectors/ enterprises

(Phy – No. of demons., Fin – Rs. In lacs)

Allied Sectors/ enterprise	Demonstrations Projection											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Dairy	500	1.0	500	1.0	500	1.0	500	1.0	500	1.0	2500	5.0
Poultry (including backyard)	50	1.0	500	1.0	500	1.0	500	1.0	500	1.0	2500	5.0
Sheep, goat and Piggery	250	0.5	250	0.5	250	0.5	250	0.5	250	0.5	1250	2.5
Mushroom	50	2.5	50	2.5	50	2.5	50	2.5	50	2.5	250	12.5
Fishery	20	1.0	20	1.0	20	1.0	20	1.0	20	1.0	100	5.0
Agro Forestry	20	1.0	20	1.0	20	1.0	20	1.0	20	1.0	100	5.0
Vermicompost	100	2.0	100	2.0	100	2.0	100	2.0	100	2.0	500	10.0
Total	1440	9.0	1440	9.0	1440	9.0	1440	9.0	1440	9.0	7200	45.0

Table 5.7 : Farmer Field Schools covering identified critical technologies in Next Five Years

(Phy – No. of field school, Fin – Rs. In lacs)

Fields	Farmer Field Schhols Projection											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Dairy	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	100	20.0
Poultry (including back yard)	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Goatry and Piggery	30	6.0	30	6.0	30	6.0	30	6.0	30	6.0	150	30.0
Fish Farming	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	100	20.0
Bee Keeping	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Agro Forestry	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Mushroom	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Vegetable crops	50	10.0	50	10.0	50	10.0	50	10.0	50	10.0	250	50.0
Horticulture	60	12.0	60	12.0	60	12.0	60	12.0	60	12.0	300	48.0
Total	205	41.0	205	41.0	205	41.0	205	41.0	205	41.0	1025	193.0

Cost norms- Rs. 0.20 lac/ FFS

Table 5.8: Group formation /Commodity interest groups formation for specific activities

Interest Group(s)	Group Formation Projection Plan											
	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Dairy	20	4.0	20	4.0	20	4.0	20	4.0	20	4.0	100	20.0
Poultry (including back yard)	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Goatry and Piggery	10	2.0	10	2.0	10	2.0	10	2.0	10	2.0	50	10.0
Fish Farming	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Bee Keeping	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	10	2.0
Agro Forestry	2	0.4	2	0.4	2	0.4	2	0.4	2	0.4	10	2.0
Mushroom	5	1.0	5	1.0	5	1.0	5	1.0	5	1.0	25	5.0
Vegetable crops	50	10.0	50	10.0	50	10.0	50	10.0	50	10.0	250	50.0
Horticulture	6	1.2	6	1.2	6	1.2	6	1.2	6	1.2	30	7.2
Total	105	21.0	105	21.0	105	21.0	105	21.0	105	21.0	525	105.0

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

for group specific activities)

5.16 Projected outcome and growth rate during XI Five Year Plan

Table 5.9 : Area, Production and Productivity Trend of Main Crops in the District (hort. /veg. crops)

(Area – ha, Production – 000 q, productivity – q/ha)

Sl. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08 (Projected)			2008-09 (Projected)			2009-10 (Projected)			2010-11 (Projected)			2011-12 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Citrus	575	43850	76.26	600			650			700			750			800		
2	Guava	256	27350	106.83	280			300			325			350			400		
	Aonla	13	1600	123.07	20			30			40			45			50		
	Jamun	15			20			25			30			35			40		
	Ber	148	1460	98.64	160			168			178			190			200		
3																			
4	Cucurbits	1450	105850	73			76			79			82			85			88
5	Brinjal	415	74285	179			186			193			200			210			220
6	Bhindi	515	31930	62			64			66			68			70			72
7	Peas	300	16800	56			58			60			62			64			67

Sl. No.	Name of Crop	Normal 2004-05 to 2006-07			2007-08 (Projected)			2008-09 (Projected)			2009-10 (Projected)			2010-11 (Projected)			2011-12 (Projected)		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
8	Potato	425	65875	155			161			167			174			180			188
9	Cauliflower	1040	171600	165			172			179			186			193			201
	Cabbage	830	163510	197			206			218			224			229			234
	Radish	1290	223170	173			180			187			194			199			206
10	Carrot	950	154850	163			169			176			184			190			199
11	Onion	280	53200	190			198			2009			220			230			140
12	Tomato	475	76950	162			170			178			186			194			202
	Chillies	645	74175	115															
	Leaf vegetables	885	6890																

Source: Deptt. Of Horticulture

CHAPTER VI

District Plan

6.1 Introduction

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

6.2 Growth drivers

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

6.2.1 Agriculture

- a) Increasing area under hybrids in rice, improved varieties in wheat, Bt.cotton, guar, bajra and oil seeds.
- b) Resource conservation technologies for sustaining and improving the productivity levels.
- c) Mechanization for increasing water use efficiency.
- d) Seed treatment and enhancing seed replacement rate.
- e) IPM, INM and IWM.
- f) Demonstration and capacity building of field functionary and farmers
- g) Human resource development.

6.2.2. Horticulture

- a) Increasing area under fruits and vegetable crops.
- b) Providing improved planting material of fruit crops.
- c) INM, IWM and IPM .
- f) Encouraging income and employment generating vocations through agro based vocations.
- g) Demonstrations and trainings including farmers and field official

6.2.3 Forestry:

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

6.2.4. Animal Husbandry:

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

6.2.5 Fisheries:

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

6.3 Innovative Schemes/ Projects

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

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

Logical framework matrix

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

A) Cost For Strengthening Infrastructure at KVK (at district level)

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

B) Cost For Strengthening Infrastructure at FIAC (block level)*

Sr. No.	Infrastructure	No.	Cost (in lacs)/ unit	Total cost (Rs. lacs)
1	Well Equipped Training Hall	7	30.0	210.0
2	E- connected computer lab	7	10.0	70.0
	Total		40.0	280.0

Total Cost of the Project (A+B)= Rs. 83.0+280.0 = Rs.363.0 lacs

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

C)A laboratory for quantifying nutrients deficiency symptoms in plants for efficient growth management.

Rs 100.00 lacs.

4. Project on Reclamation of Alkali soils & waters

The soils which have Exchangeable sodium percentage (ESP) more than 15 and Electrical conductivity less than 4.0 m m hos/cm at 26° c are called alkali soils. These types of soils generally occur in semi arid and arid regions in small irregular areas. The exchangeable sodium present in alkali soils may have marked effect on physical and chemical properties. As the ESP increases, the soils tend to become more dispersed. The PH reading may increase, sometimes becoming as high as 10. This alkalinity deteriorates the soil fertility. In such soil seed germination is severely affected, plants remain stunted and ultimately land to low yield thus causes heavy loss of national wealth. In such soil due to dispersion of the day water does not percolate down easily. To reclaim such soils first we should take samples and get them analyzed for their gypsum requirement. Application of gypsum based on gypsum requirement is the only way for their reclamation.

Logical framework matrix- Reclamation of Alkali Soils in District Fatehabad

Narrative Summary	Objectively verifiable indicators
<p>Project goal- To reclaim Alkali soils through application of gypsum.</p> <p>Purpose- To improve the fertility and productivity of the soil. Leaching the extra salts of sodium. Improve the physic chemical properties of the soils.</p> <p>Output-Increase in the production of the crops and thereby increase in income of the farmers. The soil will be made suitable for crop production. The ESP will be reduced.</p>	<p>To reclaim such soils first we should take samples and get them analyzed for their gypsum requirement. Application of gypsum based on gypsum requirement is the only way for their reclamation. After that soils are tested for pH, EC, SAR or ESP to see whether soils are reclaimed or not.</p> <p>At present the total alkali soil in district Fatehabad is about 3720 ha.</p>

At present the total alkali soil in district Fatehabad is about 165 ha

Cost of Project to reclaim 3720/165 ha of Alkaline soils

Component	Cost (Lacs Rupees)
Soil testing	1.03
Soil survey and land leveling	0.41
Gypsum application	2.06
Labour cost	0.21
Monitoring & Evaluation	2.00
Total Cost	5.71

Year wise budget required to reclaim Alkaline soils

Component	2007-08	2008-09	2009-10	2010-11	2011-12	TOTAL
Area to be reclaimed (ha)	33	33	33	33	33	165
Total cost of the project(in lacs) (including other expenses)	1.14	1.14	1.14	1.14	1.14	5.70

Logical framework matrix-

3. Supplementing mineral mixture to dairy animals in District Sonipat

Narrative Summary	Objectively verifiable indicators
<p>Project goal- To increase milk yield and to reduce infertility and inter calving period in animals.</p> <p>Purpose- To over come the deficiency of the essential minerals in order to increase milk</p>	<p>Out of 15000 animals covered under the project each year (by involving Gram Sabha members and field level Vety. Personnels for general health improvement and increase in milk yield.</p>

<p>yield and to improve the general health of the dairy animals to overcome infertility , repeat breeding and delayed calving.</p> <p>Output-Increase in the production of the milk and thereby increase in income of the farmers. Reduction in inter calving period.</p>	
--	--

Cost of the Project: 56.25 lacs

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

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

Logical framework matrix-

7. To improve Soil health through Green Manuring in District Fatehabad

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

Cost of the Project:

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area under paddy – wheat cropping system(ha)	70000	70000	70000	70000	70000	
Area to be covered under green manuring(ha)	13600	13600	13600	13600	13600	68000
Dhaincha seed* to be required@ 30 kg/ha (q)	4080	4080	4080	4080	4080	20400
Cost of the seed @ Rs. 1500/q (in lacs.)	61.2	61.2	61.2	61.2	61.2	
Subsidy @ 75%	45.9	45.9	45.9	45.9	45.9	229.5
Monitoring and evaluation	0.61	0.61	0.61	0.61	0.61	3.05
Total cost						232.55

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

Tota cost of the project on green manuring =232.55 lacs

Logical framework matrix-

8. To increase the acreage and production of pulses in paddy- wheat cropping system by introducing summer moong.

Narrative Summary	Objectively verifiable indicators
<p>Project goal- To increase the availability of pulses.</p> <p>Purpose- To increase pulse production by improve the fertility and productivity of the soil under paddy-wheat system. Improve the physic chemical properties of the soils. To increase in the organic matter of the soils.</p> <p>Output-Increased pulse production with increase in farm income with additional benefit of improvement in the soil organic matter.</p>	<p>Impact study of summer moong on comparative profitability of paddy wheat rotation and soil health status will be conducted by KVK. 25 % of paddy area should be covered under summer moong at the end of project.</p>

Cost of the Project:

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area under paddy – wheat cropping system(ha)	70000	70000	70000	70000	70000	
Area to be covered under green manuring(ha)	6500	6500	6500	6500	6500	32500
Moong seed to be required@ 30 kg/ha (q)	1950	1950	1950	1950	1950	9750
Cost of the seed @ Rs. 6000/q (in lacs.)	117.0	117.0	117.0	117.0	117.0	585.0
Subsidy required @ 75%	87.75	87.75	87.75	87.75	87.75	48.75
Budget required for Extension activities, Monitoring and evaluation(in lacs)	1.17	1.17	1.17	1.17	1.17	5.85
Total Cost of the Project						444.6

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

Objective:-

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

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

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

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

Benefits of PLL over traditional method

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

- ▶ Increase in crop yield as much as 25 per cent.
- ▶ Reduction in time of Irrigation and amount of water by upto 50 per cent
- ▶ Enhancement of the crop area by about 2 per cent
- ▶ Control of water-logging and salinity
- ▶ Facilitation in efficient use of farm machinery
- ▶ More productive utilization of seeds, fertilizers and other non-water inputs.

Project cost and Area Levelling (Rs. In Lacs)

Year	Units (No. of L. Levellers)	Total Cost Rs. 3.6 Lac/unit	Area Levelling (in ha.)	Project cost @75% subsidy 2.7 Lac/unit from RKVY	Total Cost of Project
2007-08	50	180-00	6000	135-00	135-00
2008-09	100	360-00	12000(+6000)	270-00	270-00
2009-10	100	360-00	12000(+18000)	270-00	270-00
2010-11	100	360-00	12000(+30000)	270-00	270-00
2011-12	100	360-00	12000(+42000)	270-00	270-00
Total	450	1620-00	150000	1215-00	1215.0 lacs

Total cost of Project Subsidy component @ 75% of cost Farmers are to be given 75% subsidy from RKVY)

Over a period of five years about 150000 ha. Area can be levelled under the project which will result into.

- ▶ Saving of about 1 lac million Acre feet (MAF) of irrigation water
- ▶ Increase in crop yield by about 20 per cent
- ▶ Enhancement of irrigated area by about 2 per cent (i.e. about 3000 ha) from same amount of irrigation water
- ▶ Increased efficiency of seed, fertilizer and other inputs thus reducing cost of cultivation and increasing factor productivity

11 . Income and employment generation through agro based vocations

A. Vermi-composting

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

Proposal for Vermi-compost Units to be established

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	10	10	10	10	10	50
Financial help @Rs. 0.30 lacs/unit	3.0	3.0	3.0	3.0	3.0	15.0
Total Cost of the Project(lacs)						15.00

B. Bee Keeping

The land holding in the district is small. So to increase income of the farmer and to get employment through out the year other allied vocations like Bee- keeping should be

adopted by farmers. This occupation can be done by women and old man also. With 10 boxes one can get extra income of Rs. 10000 per annum. This vocation do not require any additional land. The other additional benefit of bee keeping is that it increased the yield of cross pollinated crops.

Proposal for bee keeping units to be established

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number	20	20	20	20	20	100
Financial help @ 0.2 lacs/unit	4.0	4.0	4.0	4.0	4.0	20.00
Total Cost of the Project(lacs)						20.00

6. Deworming of dairy animals in District Fatehabad

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

Cost of the Project: 72.0 lacs

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
No. animals covered under dewormer	24000	24000	24000	24000	24000	120000
Cost @ Rs. 60/animal (lacs)	14.4	14.4	14.4	14.4	14.4	72.00

* The Dewormer will be supplied to farmers free of cost at their door step.

12. Agro- Forestry

Fatehabad district is mainly an agrarian district of Haryana state which has only about 7000 ha forest area which is only 3.4 % of the total area. But according to National Forest Policy 1989 about 25 % area of plain should be under tree covers for pollution control and sustainable production in any area. In spite of all efforts by forest department and other agencies involved for planting of trees, the forest area is not increasing in the district. The only scope for increasing the forest covers in the district is on the farmer's fields. The plantation of trees on the farmer's field not only increase the forest area in the district but also enhance the productivity of the farmer fields which ultimately increase the net income of the farmers on sustainable basis. For this extension activities like trainings, demonstrations of different trees especially eucalyptus and poplar (fast growing tree species) are to be intensified in the coming years. The details regarding demonstrations of poplar during the 11th five year plan has been given as under:

Proposal for demonstrations on Clonal Eucalyptus/Poplar

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Number of demonstration	20	20	20	20	25	105
Cost/ demo @ Rs. 0.1lac	2.0	2.0	2.0	2.0	2.5	10.5
Total Cost of the Project(lacs)						10.5

12. Seed Production for achieving desired Seed Replacement Ratio

A. Wheat

Current seed replacement ratio	=16 %
Desired seed replacement ratio	=33to40%
Certified seed availability	=23100qtls.
Additional certified seed required (as per desired seed replacement rate)	=25000 qtls

Project to produce desired certified seed

No. of villages selected from each block for seed production	=5
Total villages selected from the district	=35
Area to be brought under wheat seed programme from each selected village	=20 ha
Total area covered under each block	=20x5=100 ha
Total area covered in the district	=100x7=700 ha

Cost:

Foundation seed to seed to be supplied to the farmers for seed production	=700 qtls
Cost of each demonstration	= Rs. 5000

Total cost =5000x700x5=17500000
(175 lacs)

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area (ha)	700	700	700	700	700	3500
Financial Requirement* @ Rs.5000/ ha	35.00	35.00	35.00	35.00	35.00	175.00
Estimated Seed Produced @42.0 q/ha	29400	29400	29400	29400	29400	147000
Total Cost of the Project(lacs)						175.00

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

B . Paddy

Current seed replacement ratio =20 %

Desired seed replacement ratio =40%

Certified seed availability =2210qtls.

Additional certified seed required =2990 qtls

(as per desired seed replacement rate)

Project to produce desired certified seed

No. of villages selected from each block for seed production =2

Total villages selected from the district =14

Area to be brought under paddy seed programme from each =6ha

selected village

Total area covered under each block =6x2=12 ha

Total area covered in the district =12x 7=84ha

Foundation seed to seed to be supplied to the farmers =21.0qts

for seed production

Cost of each demonstration = Rs. 5000

Total cost =5000x84x5=21.0 lacs

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area (ha)	84.0	84.0	84.0	84.0	84.0	420.0
Financial Requirement* @ Rs.5000/ ha	4.2	4.2	4.2	4.2	4.2	21.0
Estimated Seed Produced @35.0q/ha	2940	2940	2940	2940	2940	14700
Total Cost of the Project(lacs)						21.00

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

C. Carrot/onion/potato

No. of villages selected in each block =2

for seed production

Total villages selected from the district (3 blocks) =6

Area to be brought under veg. seed programme from each =2 ha

selected village under each crop

Total area covered under each block =12 ha

Total area covered in the district =12x3=36ha

Total cost (Rs. 7500/ha)

=36x7500=270000

(2.70 lacs)

Carrot

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

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

Onion

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

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

Potato

Description	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Area (ha)	12	12	12	12	12	60
Financial Requirement* @ Rs.7500/ ha (lacs)	0.90	0.90	0.90	0.90	0.90	4.50
Estimated Seed Produced @100 q/ ha (q)	1200.0	1200.0	1200.0	1200.0	1200.0	6000.0
Total Cost of the Project(lacs)						4.50

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

14. Project proposal for the development of Panchayat/ Shyamlat Land for 10 villages and for 5 yeas (up to 2011-12)

The following work need to be taken into consideration for the development of Panchayat / Shyamlat land:-

(It is more or less on the same pattern as that of Haryali Scheme.)

Work/activity	Cost(lacs)
1. Water harvesting structure	195.00
2. Land leveling and stump uprooting	99.00
3. Roof rain water harvesting recharge structure	69.00
4. Plantation of forest trees on drainage line	18.00
5. Underground pipe line	12.50
6. Treatment of water logged area	120.00
7. Extension activities	2.50
Total cost (lacs)	507.00

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

Phy. In Nos/ha

(Rs. In Lach)

Sr. No	Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	A.Activity												
1	Trainings												
	In Service	1890	11.34	1890	11.34	1890	11.34	1890	11.34	1890	11.34	9450	56.7
	Farmers iDistt	3000	12.0	3000	12.0	3000	12.0	3000	12.0	3000	12.0	15000	60.0
	Farmers iiBlock/village	7450	29.8	7450	29.8	7450	29.8	7450	29.8	7450	29.8	37250	149.0
2.	Demonstrations												
	Varietal	2990	149.5	2990	149.5	2990	149.5	2990	149.5	2990	149.5	14950	747.5
	INM	2695	134.7	2695	134.7	2695	134.7	2695	134.7	2695	134.7	13475	673.75
	IPM	330	16.5	450	22.5	760	38.0	850	42.5	1020	51.0	3410	170.5
	RCTs	1250	62.5	1250	62.5	1250	62.5	1250	62.5	1250	62.5	6250	312.5
3.	Other activities	330	16.5	450	22.5	760	38.0	850	42.5	1020	51.0	3410	170.5
	FFSs	87	17.4	87	17.4	87	17.4	87	17.4	87	17.4	435	87.0
	Group formation	57	11.4	57	11.4	57	11.4	57	11.4	57	11.4	285	57.0
	Total	7409	392.05	7529	398.05	7839	413.55	7929	418.05	8099	426.55	38805	2048.25

Sr. No	Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
4.	B. Special Project												
	Strengthening of Training Centre				-		-	-	-				
	a) District level (KVK)	1	83.0	-								1	83.0
	b) Block level (FIAC)	6	240.0									6	240.0
	Tissue analysis lab	1	100	-	-	-	-	-	-	-	-	1	100
	Rain water harvesting	80	80.0	80	80.0	80	80.0	80	80.0	80	80.0	400	400.0
	Reclamation of Alkali soils	33	1.14	33	1.14	33	1.14	33	1.14	33	1.14	165	5.70
	Improving soil health through Green Manuring	13600	46.5	13600	46.5	13600	46.5	13600	46.5	13600	46.5	68000	232.5
	Introduction of Sumer Moong	6500	88.9	6500	88.9	6500	88.9	6500	88.9	6500	88.9	32500	444.5
	Laser levelling	6000	135.0	18000	270.0	30000	270.0	42000	270.0	54000	270.0	150000	1215.0

Sr. No	Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	Seed production :-	700	35.0	700	35.0	700	35.0	700	35.0	700	35.0	3500	175.0
	a) Wheat	84	4.2	84	4.2	84	4.2	84	4.2	84	4.2	420	21.0
	b) Paddy												
	Total	27005	813.74	38997	525.74	50997	525.74	62997	525.74	74997	525.74	254993	3017.20
	G.Total (A+B)	46754	1458.93	58866	976.93	71176	992.43	83266	996.93	95436	1005.43	355498	5331.15

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

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

Sr. No.	Sector/Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	All Allied Sectors												
1	Trainings												
	In Service	1225	7.35	1225	7.35	1225	7.35	1225	7.35	1225	7.35	6125	36.75
	Farmers	4140	16.56	4140	16.56	4140	16.56	4140	16.56	4140	16.56	20700	82.8
2.	Demonstrations												
	a. Horticulture												
	Varietal	150		175		200		225		250		1000	42.20
	INM	150	7.5	180	9.0	205	10.1	230	11.5	260	13.0	975	48.75
	IPM	375	3.925	375	3.925	375	3.925	375	3.925	375	3.925	1625	19.625
	RCTs												
3.	Demonstration on Allied Sector Activities	1440	9.0	1440	9.0	1440	9.0	1440	9.0	1440	9.0	7200	45.0
	FFSs (All Allied Sectors)	205	41.0	205	41.0	205	41.0	205	41.0	205	41.0	1025	193.0
	Group formation	105	21.0	105	21.0	105	21.0	105	21.0	105	21.0	525	105.0
	Total	7788	112.645	7845	115.215	7895	115.375	7935	119.825	800	122.385	39150	573.125

Sr. No.	Sector/Activity/Projects	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
4.	B. Special Project												
	Horticulture Seed production of	12	0.90	12	0.90	12	0.90	12	0.90	12	0.90	60	4.50
	Carrot												
	Onion												
	Potato	12	0.90	12	0.90	12	0.90	12	0.90	12	0.90	60	4.50
	Animal Husbandary												
	Supplimenting Mineral Mixtura	15000	112.5	15000	112.5	15000	112.5	15000	112.5	15000	112.5	75000	562.5
	Deworming	24000	14.4	24000	14.4	24000	14.4	24000	14.4	24000	14.4	120000	72.00
	Vermicomposting	10	3.0	10	3.0	10	3.0	10	3.0	10	3.0	50	15.0
	Bee Keeping	4	20.0	4	20.0	4	20.0	4	20.0	4	20.0	20	100.0
	Agro Forestry	20	2.0	20	2.0	20	2.0	20	2.0	25	2.5	105	10.5
	Development of Panchayat Land	10	507.00										507.00
	Total	39068	660.7	39058	153.7	39058	153.7	39058	153.7	39063	154.2	193305	1276
	G. Total (A+B)	46856	773.345	46903	268.915	46953	271.075	46983	273.525	47063	276.585	234455	1849.125
	All TOTAL	93600	2232.275	105769	1245.845	118129	1263.505	130249	1270.455	142499	1282.015	589953	7180.275

Table : Physical and Financial Programme Proposed under CDAP during XI Plan

(Rs. In lakh)

Name of Work	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
A) Extension Activities												
Agriculture	19749	645.19	19869	451.19	20179	466.69	20269	471.19	20439	479.69	100505	2313.95
Allied sectors	7788	112.645	7845	115.215	7895	117.375	7935	119.825	8000	122.385	39150	573.125
Total	27537	757.83	27714	566.405	28074	584.065	28204	591.015	28439	602.075	100505	2887.075
B) Special projects												
Agriculture	27005	813.74	38997	525.74	50997	525.74	62997	525.74	74997	525.74	254993	3017.20
Allied sectors	39068	660.7	39058	153.7	39058	153.7	39058	153.7	39063	154.2	195305	1276.0
Total	66073	1474.44	78055	679.44	90055	679.44	102055	679.44	114060	679.94	450298	4293.2
Grand TOTAL	93600	2232.275	105769	1245.845	118129	1263.505	130249	1270.455	142499	1282.01 5	589953	7180.275

Conclusion

In the light of prevailing agricultural scenario (with its roots in past and head in future) the following vision of the district was evolved through participatory methodology

1. Haryana farmers have become important competitors in all sorts of agricultural produce, from cereals to milk, mushroom, honey, vegetables and even fisheries. It is well known for its basmati rice and Murrah buffalo. It is now transforming its economy by giving increased emphasis on service and manufacturing sectors. The success of Haryana's economic transformation is can be measured by the falling share of agriculture in the gross domestic product which has decreased to almost 22%. Industry and services are indeed growing even faster than farming and absorbing its surplus labour. Agriculture is likely to provide less jobs now compared with over two-thirds only ten years ago. Even so, over 60% of the population still lives in the villages, so a successful rural economy will remain the key to maintaining its impressive progress. Knowledge and skills of our farmers and extension agencies help us to understand our farming systems better. It is also a source of creative, innovative and economic strength especially in situations that currently exists in rural Haryana where its young population does not wish to adopt farming as a profession. The way urbanization is happening in Haryana also calls creation of culture that helps farmers to adopt subsidiary occupations. The proportion of farmers directly working on farms is likely to decrease steadily. Diversity within the rice-wheat cropping system and across sectors in the form of integrated farming systems is one the important ingredient of success. We are convinced that the different sources of income including crops, dairying, mushroom cultivation and honeybee production etc can help farmers to get daily income. Balancing crop cultures and subsidiary occupations is the focal aspect of diversification in Fahehabad district.
2. We systematically need to focus our activities throughout the value chain on the challenges of sustainable agriculture development starting from production to

processing and from crop based enterprise to all other enterprises that help farmers to raise their income and remain engaged at the same time. Goal is to increase productivity at 4% per year, reduce water consumption by 10 % in each cropping system, energy consumption by 10%. The reductions in energy consumption up to 50% need to be targeted through reduced fuel consumption at crop establishment. Savings in energy consumption is expected to reduce the associated carbon dioxide emissions. The price of already subsidized diesel will rise further. Technologies like zero-tillage for conservation agriculture are available that can reduce the energy consumption and increase profits. In future especially in rice-wheat cropping system, the size of operation land holding will demand the use of these technologies to increase resource use efficiency.

3. The increased targets of eleventh five year plan could be met only by the greater adoption of efficient higher technology levels in all cropping systems especially in blocks where input use is less. This would require large scale availability of machinery for land levelling (laser land leveller), tillage (especially zero tillage machines, bed planter, paddy transplanters) and precise placement of seeds and fertilizers at the appropriate depths (especially in South West Haryana). It is expected that the custom hire services will be encouraged. It is also expected that more land will be available on lease and therefore farmers would need more machinery for saving labour and increasing the efficiency of inputs. Yield level of top 10 per cent farmers may be assumed as an attainable yield in any coming season. The exercise of monitoring yield levels in each districts must be done for planning for the next season. This exercise may be made mandatory for each KVK and should form the part of planning process for any current year. Time has now come to again review the recommendation of fertilizer and to meet the target of attainable yield of top 10 per cent farmers, the recommendations of fertilizers may have to increase from current level.
4. Haryana's agricultural miracle was achieved by the evolution of green revolution varieties and their management, creation of favorable infrastructure of irrigation, fertilizer industry and marketing. During last few years the growth in cereal production has been due to agronomic management and free market economy by

giving good prices of agriculture produce to its farmers. None of this would have happened had Haryana not had fertile soil and plentiful irrigation resources, with large tracts (more than 80%) of its land ideal for cultivation. However, the recent debate on falling water table and deteriorating soil health has prompted scientists to rethink. They are now advising farmers to move away from frequent cultivation, excess water use, imbalance use of fertilizers, and excess use of pesticides. India and perhaps, the whole world are short of wheat and rice which are best grown in Haryana. We therefore can not go for diversification that does not guarantee food supplies to growing population of India. Scientists at CCS HAU have favored diversification within rice-wheat cropping system (RWCS) with technologies that are less costly and allow savings in the natural resources. The slogan of diversification may have gone too far with out any tangible outcome.

5. The average inflation has risen (May, 2008) and the main cause has been the surge in the prices of food and oil. Higher oil prices could further push up the inflation expectations. Higher food prices are generally fed into other prices including a significant rise in the rental value of land in rice-wheat cropping system. Government is using price control, export gaps, and subsidies on inputs to control prices. High productivity growth expectations through RKVY have to be properly anchored by accelerating the further adoption of technologies like zero-tillage to cut cost and improve profitability of farmers.
6. As the computing has become easy and affordable, extension services and/or technologies can be out sourced from any where. As it happened in case of Bt cotton and hybrid vegetables, more and more linkages and synergies need to be developed by outsourcing technologies. More and more infrastructure, facilities need to be put to use with DDA's, DHO, Animal husbandry officers, Fishry officers which then can be linked to KVK's for a perfect integration of agriculture. Data centers need to be created to increase the computing capacity of extension workers. Data centers for the district may be located at the KVK as part of knowledge centers. The data Centers for the state may be located at main campus of CCS-HAU, Hisar.