

**STATE AGRICULTURE PLAN
(SAP)**

**FOR RASHTRIYA KRISHI VIKAS YOJANA (RKVY)
OF XITH FIVE YEAR PLAN**

**DIRECTORATE OF EXTENSION EDUCATION
CCS HARYANA AGRICULTURAL UNIVERSITY
HISAR**

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The economic reforms commenced in 1991 has successfully put the economy in a higher growth orbit with more than 8 percent growth rate in total Gross Domestic Product (GDP) especially during the recent years. However, the agriculture sector which accounted for more than 30 percent of total GDP at the beginning of reforms failed to maintain its pre-reform growth. On the contrary, it witnessed a sharp deceleration in growth after mid 1990s as the per annum growth in agriculture sector dropped to 1.9 percent during 1996-97 to 2001-02 from 3.2 percent in the period 1980-81 to 1995-96. This happened despite the fact that agricultural productivity in most of the states was quite low, as it were, and the potential for the growth of agriculture was high. The 10th five year plan target of growth of 4 percent per annum in agriculture and allied sectors, set to reverse the sharp deceleration of 1996-97 to 2001-02, has not been achieved. The approach paper to the 11th plan also emphasized that reversal of the deceleration in agricultural growth witnessed after 1996 is a pre- requisite for the success of this plan. **A sustained and wide spread agricultural growth is a pre-condition of development in India as more than 50 percent of country's work force still depends upon agriculture for its livelihood.** This slow growth in agriculture (including allied sectors) can be of great strain for the economy as agriculture is not only an important driver of macro- economic performance but it also is an essential element of the strategy to make growth more inclusive. Concerned over this pace of growth in agriculture and allied sectors, the National Development Council (NDC), in its meeting held on 29th May, 2007 resolved that a special Additional Central Assistance Scheme i.e. National Agriculture Development Programme (NADP)/ Rastriya Krishi Vikas Yojana (RKVY) be launched with 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.

Methodology

The C-DAPs were prepared as per the process and methodology suggested by the Planning Commission, Government of India. The approach followed in preparation of the document was necessarily of Participatory Appraisal mode. CCS Haryana Agricultural University, Hisar, 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 each district was given to the respective Krishi Vigyan Kendra. 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.

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, Panchayati Raj Institution's members and farmers were conducted at different levels. Collected secondary data and related statistics needed for planning from different departments and other sources.

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

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

Holding farmer meetings at villages of the district

The field staff of agriculture and allied departments organized meetings in their respective area of operation on C-DAP formation. The field staff discussed whole gamut of activities undertaken in the plan in the villages and feedback given to KVK team/district core team entrusted with the preparation of CDAP. Thus, the representation

of all the villages was ensured through this procedure. The KVK team also conducted progressive farmers' meets and village and block level meetings for receiving feedback regarding the plan formulation.

The KVK team analyzed the primary and secondary data, held wide discussions with different stake holders and prepared the C-DAP of their districts in a participatory manner. The recommended interventions based on this analysis are in the form of two distinct streams, i. e. Stream I and Stream II as suggested under RKVY. The draft plan was discussed in the ATMA governing board and their suggestions were incorporated in the final draft which was again put to PRIs of the district concerned. After PRIs approval this plan is being submitted.

CHAPTER 2

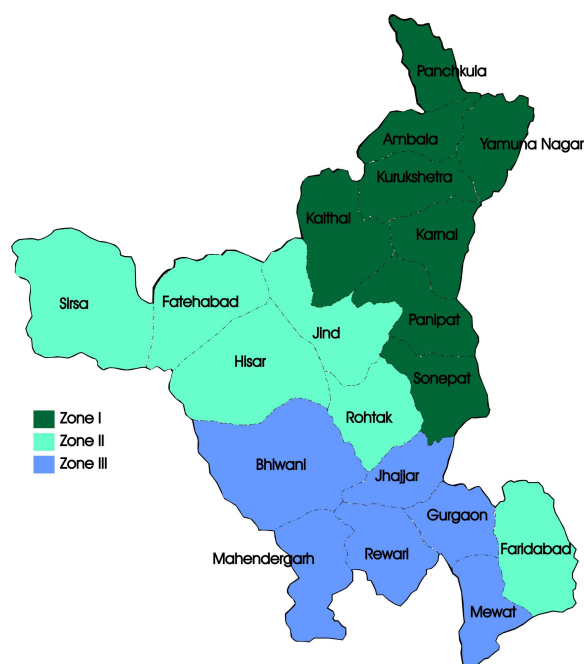
GENERAL DESCRIPTION OF THE STATE

General Description of the State

Out of 4.42 m ha of total geographical area of Haryana state 80% is under cultivation. The irrigated area constitutes 84% of the cultivated area in the state. The cropping intensity of the state is 181% with total foodgrains production of over 13 m tonnes. The dominant cropping systems are : **Rice-Wheat, Cotton-Wheat and Bajra-Wheat.**

The natural resource base of agriculture, which provides for sustainable production, is shrinking and degrading and is affecting production capacity. About 62% area of the state is underlain with poor quality water. There are problems of declining as well as rising water tables, soil salinity/alkalinity, declining soil health and stagnating crop productivity. Efficiency-mediated improvement in productivity is the most viable option to raise production.

2.1 Map of the State depicting three zones



2.2 Different Zones of the State

Based on ecology and cropping pattern, whole State is divided into following three zones :-

Zone-I : The domain area of this zone includes eight districts viz. Panchkula, Ambala, Kurukshetra, Yamunanagar, Karnal, Kaithal, Panipat and Sonipat.

Zone-II : The domain area Zone-II includes seven districts namely Sirsa, Fatehbad, Hisar, Jind, Rohtak, and Faridabad including Palwal.

Zone-III : The domain area of this zone includes six districts namely Bhiwani, Mohindergarh, Rewari, Jhajjar, Gurgaon and Mewat.

2.3 General Statistics of Different Zones :

Zone-I

Table 1. Land utilization Statistics

Sr. No.	Particulars	Districts							
		Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
1	Total area (ha)	89000	153731	168000	172536	246026	231077	130437	213387
2	Forests (ha)	34802	1174	1000	14777	10000	7680	3028	7369
3	Land under non agri. Use (ha)	3952	2666	15000	25997	12000	34442	24005	34066
4	Permanent pastures (ha)	3952	843	-	1735	4000	-	-	2412
5	Current fallows (ha)	-	393	1000	52	4000	-	-	2000
6	Total cultivable area (ha)	90542	135052	151000	125830	220108	217432	102513	180537
7	Total cultivated area (ha)	29112	133817	150000	121170	209885	196635	99408	170714
8	Net Irrigated area (ha)	24000	127350	150000	182623	208566	216502	89491	162328
9	Area irrigated by canals (ha)	-	14000	27000	2767	4258	66441	29760	78577
10	Area irrigated by Tube well (ha)	2000	111000	123000	179856	204308	150061	69731	83551
11	Cropping Intensity (%)	68.2	154	184	137	186	190.4	194	169

Table 2. Area, Production and Productivity of Major Crops

Crops	Particulars	Districts							
		Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Rice	Area (ha)	7340	81000	115000	59000	166000	150488	71000	68000
	Prod. (q/ha)	40.0	26.7	40.0	36.2	46.98	42.0	27.38	25.2
Wheat	Area (ha)	19000	82000	112000	69000	167000	174552	82000	140000
	Prod. (q/ha)	23.8	32107707.7	47.7	41.6	44.23	41.6	44.87	42.2
S. cane	Area (ha)	800	11000	16000	40000	12000	4000	7820	13000
	Prod. (q/ha)	68	61.6	-	66.2	725.3	536.2	665.0	589.8
Raya	Area (ha)	-	716	-	-	-	-	1019	4000
	Prod. (q/ha)	-	10.2	-	-	-	-	13.41	13.4
Arhar	Area (ha)	-	-	-	-	-	-	335	9000
	Prod. (q/ha)	-	-	-	-	-	-	11.94	10.0
Bajra	Area (ha)	-	-	-	-	-	12510	698	9000
	Prod. (q/ha)	-	-	-	-	-	17.4	18.77	20.0
S.flower	Area (ha)	-	5000	9000	2000	4000	-	-	-
	Prod. (q/ha)	-	17.5	20.4	13.4	16.8	-	-	-
Sorghum fodder	Area (ha)	-	18152	-	-	13000	-	10693	12000
	Prod. (q/ha)	-	512.5	-	-	205	-	-	180
Veg.	Area (ha)	10500	25553	19865	10820	19700	-	19736	23370
	Prod. (q/ha)	104.6	-	134	-	133	-	-	-
Fruits	Area (ha)	8900	-	1105	5250	1770	916	700	-
	Prod. (q/ha)	650	-	742	-	40	-	-	-
Cotton	Area (ha)	-	-	-	-	-	6590	-	-
	Prod. (q/ha)	-	-	-	-	-	10.0	-	-

Prod. -Productivity; S. cane – Sugarcane; Veg. - Vegetable crops; S.flower – Sunflower

Table 3. Allied Sectors in the Different Districts of Zone

Allied Field	Particulars	Districts							
		Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonapat
Cattle	No.	6592	69585	83530	107707	124922	80939	40355	69182
	Prod. Lt/animal/day	2.5	4.6	5.1	3.5	6.2	4.7	-	5.5
Buffaloes	No.	28008	242177	256739	176743	381075	388172	253966	364560
	Prod. Lt/animal/day	4.3	5.7	7.2	4.5	5.7	5.2	-	5.9
Sheep and Goat	No.	16159	19149	18140	30449	-	24707	15450	24726
	Prod. Lt/animal/day wool/animal/day	0.75	0.6	-	-	-	0.58	-	0.75
Pig	No.	-	6010	-	6800	6444	22769	-	12411
	Prod. Kg./animal	-	19.3	-	-	42.3	31.7	-	39.4
Poultry	No.	589870	709394	1375790	1522434	1701883	1240600	1704472	16000354
	Prod. egg/bird/year	165	152	231	-	256	197	-	243
Mushroom	No. (Trays)	6500	9200	69250	71300	70000	8476	239285	416810
	Prod. Kg/tray	6.8	4.8	6.0	5.0	4.55	4.9	5.68	5.25
Fish	Area (ha)	156	353	334	385	-	-	459	1105
	Prod. t/ha	4.9	4.6	4.6	4.1	-	-	5.10	4.4

Zone-II

Table 4. Land utilization Statistics

Sr. No.	Particulars	Districts					
		Sirsa	Fatehabad	Hisar	Jind	Rohtak	Jhajar
1	Total area (ha)	427177	252304	404308	274115	166847	172167
2	Forests (ha)	-	237	6300	7000	4475	5075
3	Land under non agri. Use (ha)	-	-	-	28314	564	38400
4	Permanent pastures (ha)	-	-	-	-	3167	1800
5	Current fallows (ha)		9139		6571	2069	6719
6	Net cultivated area (ha)	365704	219201	311000	239235	126268	121666
7	Gross cropped area (ha)	603413	408829	311082	475469	215786	
8	Net Irrigated area (ha)	283525	-	301518	235967	125000	112491
9	Area irrigated by canals (ha)	250116	-	290660	147588	84000	25630
10	Area irrigated by Tube well (ha)	33409	-	10858	88379	41000	86861
11	Cropping Intensity (%)	165	192	190	198	171	181

Table 5. Area, Production and Productivity of Major Crops

Crop	Particulars	Districts						
		Sirsa	Fatehabad	Hisar	Jind	Rohtak	Jhajjar	Faridabad
Rice	Area (000 ha)	46000	68.28	35	107	20	17	26.3
	Prod. (q/ha)	37.99	62.9	26.88	23.33	18.33	17.0	23.95
Wheat	Area (000 ha)	118300	185.39	212	215	95	85.1	109
	Prod. (q/ha)	45.85	44.24	43.92	47.70	39.58	38.64	38.75
S. cane	Area (000 ha)	-	13	-	-	13	-	6
	Prod. (q/ha)	-	589.8	-	-	644.3	-	411.9
Raya	Area (000 ha)	88000	13.72	58	6	19	56.4	3.8
	Prod. (q/ha)	13.18	14.68	15.0	15.06	14.38	8.54	11.31
Arhar	Area (000 ha)	-	-	-	-	11	7.2	7.0
	Prod. (q/ha)	-	-	-	-	11.76	-	3.8
Bajra	Area (000 ha)	9000	12	64	53	17	26.8	6.7
	Prod. (q/ha)	17.74	23.74	23.0	19.33	21.10	13.1	11.79
Cotton	Area (000 ha)	191000	91.14	130	43	9	-	-
	Lint Prod. (q/ha)	6.60	8.19	5.18	5.78	4.79	-	-
Guar	Area (000 ha)	-	-	65	-	-	-	-
	Prod. (q/ha)	-	-	11.0	-	-	-	-
Barley	Area (000 ha)	23000	-	6	-	1.1	-	-
	Prod. (q/ha)	28.19	-	35.3	-	25.70	-	-
Gram	Area (000 ha)	8000	-	15	-	1.7	-	-
	Prod. (q/ha)	8.97	-	8.32	-	8.8	-	-
Sorghum fodder	Area (000 ha)	-	12	-	-	23.5	25.4	62
	Prod. (q/ha)	-	180	-	-	225	-	520
Veg.	Area (000 ha)	5.7	10.5	-	10.9	1.2	3.14	10.7
	Prod. (q/ha)		140.83	-	136.50	145	-	211.1
Fruits	Area (000 ha)	5.5	1.0	-	1.00	0.55	0.51	0.59
	Prod. (q/ha)		101.2	-	86.00	92	128	149.7
Flowers	Area (000 ha)	-	-	-	.15	0.11	0.39	0.52
	Prod. (q/ha)	-	-	-	52.00	22.5	50.0	65.90

Prod. -Productivity

S. cane – Sugarcane

Veg. - Vegetable crops

Table 6. Allied Sectors in the Different Districts of Zone

Sr. No.	Particulars	Districts					
		Sirsa	Fatehabad	Hisar	Jind	Rohtak	Jhajjar
Cattle	No.(in milk)	51004	14731	23620	19652	9266	17206
	Prod. Lt/animal/day	6.1	6.28	5.7	5.2	5.7	5.3
Buffaloes	No. (in milk)	103757	94156	144934	145019	96828	159168
	Prod. Lt/animal/day	7.7	6.5	6.6	8.1	6.8	5.9
Goat	No. (in milk)	18810	5140	9466	5561	2840	8042
	Prod. Lt/animal/day	0.77	0.80	0.78	0.67	0.66	0.77
Sheep	No.	175445	74533	131928	75040	87756	35976
	Prod.(wool in kg/animal)	0.99	0.7	1.02	0.85	0.96	0.96
Pig	No.	2440	1526	4767	11916	675	882
	Prod. Kg./animal	38.32	41.1	38.0	41.60	39.46	39.54
Poultry	No.(layer)	13249	61743	67858	57190	79781	23452
	Prod. egg/bird/year	186	193	178	215	182	183
Mushroom	No. (Trays)	2000	-	-	32750	67550	40000
	Prod. Kg/tray	4.0	-	-	5.19	6.5	3.5
Fish	Area (ha)	100	-	-	556.67	311	880
	Prod. t/ha		-	-	5.2	500	4.5

Zone-III

Table 7. Land utilization Statistics

Sr. No.	Particulars	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohinder- garh	Rewari
1	Total area (000,ha)	466	120	191	184	194	151
2	Forests (000,ha)	3	4	-	-	2	1
3	Land under non agril. use (000,ha)	24	31	7	7	22	15
4	Permanent pastures (000,ha)	-	100	-	34	-	-
5	Current fallows (ha)	-	-	-	12484	17946	2965
6	Area under forests (sq.km)	89	23	39	41	46	41
7	Total cultivable area (000,ha)	419	85	180	147	157	131
8	Total cultivated area (ha)	393134	78280	161000	146000	153156	119869
9	Net area sown (000,ha)	395	84	159	133	151	112
10	Net Irrigated area (000,ha)	283	76	114	85	85	96
11	Area irrigated by canals (ha)	144	1	56	9	8	2
12	Area irrigated by Tube well (000,ha)	139	75	58	76	77	94
13	Cropping Intensity (%)	175	154.3	151	150	181.4	145

Source : Statistical Abstract of Haryana

Table 8. Area, Production and Productivity of Major Crops

Area : 000,ha ; Production : 000,tonnes

Crops	Particulars	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohinder- garh	Rewari
Rice	Area (ha)	13.6	2.3	17.2	8.1	@	0.8
	Prod. (q/ha)	26.2	6.0	31.0	15.0	-	3.0
Wheat	Area (000,ha)	133.2	52.2	96	93.4	43.6	51.7
	% wheat area of state	5.6	2.2	4.1	3.9	1.8	2.2
	% wheat production of state	5.2	2	3.7	2.9	1.7	2.1
	Area under HYV (000,ha)	119	48	92	91	39	43
Barley	Area (ha)	4836	-	-	-	670	1300
	Prod. (q)	131745	-	-	-	13200	3783
Bajra	Area (ha)	189230	-	-	26159	103200	54000
	Prod. (q)	1921420	-	-	351469	1551000	69822
Total cereals	Area (000,ha)	34.01	91.0	172.0	142.2	145.3	113.9
	Production (000,tonnes)	820.0	278.0	462.0	347.0	336.0	299.0
Sugarcane	Area (000,ha)	1.8	@	2.6	0.8	@	@
	Prod. (000q)	10.4	-	19.2	4.6	-	-
Raya	Area (ha)	161318	-	-	35447	96121	71000
	Prod. (q/ha)	1832120	-	-	304422	1371	103944
Total pulses	Area (000,ha)	76.2	0.5	7.7	1.8	7.9	0.3
	Production (000,tonnes)	58.8	0.3	8.0	2.5	9.1	0.2
Bajra	Area (000,ha)	184.7	32.8	30	26.3	101	57.6
	Area under HYV (000,ha)	161	29	25	24	94	52
S.flower	Area (ha)						
	Prod. (q/ha)						
Sorgum fodder	Area (ha)						
	Prod. (q/ha)						
Jowar	Area (000,ha)	2.7	1.5	25.8	12.8	@	2.0
	Production (000,tonnes)	1.0	1.0	7.0	4.0	-	1.0
Fruits & Vege.	Area (ha)	1898	2668	899	2912	591	763

Source : Statistical Abstract of Haryana

Table 9. Allied Sectors in the Different Districts of Zone-III

Allied Fields	Particulars	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohinder-garh	Rewari
Cattle	No.	935	634	373	-	308	219
Buffaloes	No.	4417	3505	2564	-	2268	2052
Sheep	No.	881	259	260	-	-389	262
Goats	No.	605	649	87	-	567	281
Fish	Area (ha)	718	476	803	1193	290	455
	Prod. (tones)	3393	2660	4405	2195	5681	1530
Veterinary Hospitals							
Hospitals (GVH)	No.	74	21	90	27	51	49
Dispensaries (GVD)	No.	146	46	53	90	59	61
Farm Machineries							
Tractors	No.	22230	4740	15548	10743	4914	7975

Source : Statistical Abstract of Haryana

CHAPTER 3

CONSTRAINTS IN AGRICULTURE

3.1 Constraints in Agriculture

The major obstacles affecting the progress and productivity of the State as identified by participatory approach are as follows.

- ❖ Declining / Rising water table
- ❖ Slow pace of diversification
- ❖ Emphasis on single commodity/ crop approach rather than farming system approach
- ❖ Depleting soil fertility
- ❖ Salinity and alkalinity problems
- ❖ Non-judicious use of fertilizers and chemicals
- ❖ Rising costs and diminishing economic returns
- ❖ Increasing infestation of insect-pest and disease complex
- ❖ Decline in factor productivity
- ❖ Shift in weed flora
- ❖ Inadequate availability of quality seeds (including vegetables)
- ❖ Low productivity and poor management in large and small ruminants
- ❖ Fragmented small holdings
- ❖ Farmers inability to invest
- ❖ Personal and social outlook
- ❖ Lack of orientation in development department
- ❖ Lack of farm finance and marketing awareness
- ❖ Lack of Public Private Partnership

CHAPTER 4

GAP ANALYSIS, STRATEGIES AND APPROACHES FOR AGRICULTURE AND ALLIED SECTORS

4.1 ZONE-I :

Table 10. Gap analysis, Strategies and Approaches for Agriculture

S.N.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology
A. Wheat				
1.	Timely seeding of wheat	Delayed harvesting of Basmati rice, labour scarcity, delay in pre sowing irrigation (delay in canal release, erratic power supply), wheat after sugarcane ratoon, overlapping operations (Market efficiency), excess/ untimely rains in odd years	Zero tillage, short duration varieties of rice, reduced duration of Basmati rice, direct seeding of Basmati, regulation of canal irrigation water supply, priority power supply at sowing time, timely arrangement of seed and fertilizers.	Research, extension and development agencies should jointly approach in a farmers' participatory approach for each of possible solution. Evaluating and refining the technology for a range of solutions, developing guidelines for achieving good establishment with residue retention, efficient use of N fertilizer. Testing of novel seeders in preparation for its commercialization e.g. Happy seeders.
2.	Seed treatment	Termites, fungal diseases like loose smut, flag smut and Karnal bunt	Seed treatment with insecticides, fungicides and bio-fertilizers. Seed priming if sowing is delayed	Awareness of farmers regarding importance of seed treatment by the University and the State Department of Agri, approaching as campaign.
3.	Nutrient mining & increased incidence of multiple nutrient deficiencies	In RWCS, average N 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, 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 from soil, organic amendments, crop residue and irrigation water. Apply fertilizer to fill the deficit between crop needs and indigenous supply.	Experimental research in different cropping systems, relook at soil test values, change in the recommendation of practice, soil fertility map and soil health cards to individual farmers, use of information technology, supporting data through remote sensing

4.	Varietals' improvement	No variety to tolerate terminal heat, short duration variety produces less yield Monoculture- PBW 343 is still the leading variety.	Varieties with stay green character near maturity, long duration varieties, varieties which can fit early sowing starting from 15 th Oct. to manage terminal heat at maturity	Breeding for heat tolerance, terminal heat management through irrigation and nitrogen work on hybrid wheat. Improve straw stiffness and grain size of WH 542
5.	Management of salinity & alkalinity	Decreased yield in the drought year because of life saving irrigations with brackish water in kharif crops Salt stress causing forced maturity and less yield	Avoid irrigation with brackish water in drought years because it leads to secondary salinity, wherever available make conjunctive use of water. Tolerance of current and improved varieties to salinity and sodicity needs further investigations. Work is also needed to adapt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability, profitability and yield.	Zero Tillage Safe use of brackish water and land reclamation for significant yield gain.
6.	Weed management	<i>Phalaris minor</i> seriously affects wheat yields in rice-wheat cropping system. Complex weed flora affects wheat yield in non-rice wheat cropping system. <i>Phalaris</i> resistance will be a major problem and needs immediate attention for solution. We must delay or avoid resistance.	Improve efficiency of existing herbicides. Introduce new herbicides. Capacity building for spraying techniques. Ecological approached including zero-tillage crop rotation. Monitoring of resistance build up. Germplasm management for competitive varieties	State level strategic plan for the management of <i>Phalaris minor</i> integrated. Capacity building of extension agencies and farmers for appropriate spraying techniques. On farm demonstrations of new herbicides
B.	Rice			
1.	Hybrids	Less number of hybrids in Basmati group, lodging in coarse rice hybrids, susceptibility to insect pest and diseases	Expand area under hybrids in evolved and coarse rice.	Should concentrate on evolving hybrids for Basmati rice, better hybrids from National Research system, mandatory testing of hybrids from private sector.
2.	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, mobilize local workforce through crop production on share basis.	Farmers' participatory approach for evolving crop establishment techniques, availability of paddy transplanter, custom hire services for raising nursery, evolving culture of partnership between landless workforce and landlord.
3.	Green manuring	Shortage of varieties for summer moong, shortage of quality seed of <i>Sesbania</i>	Introduce summer moong immediately after wheat harvest even under zero tillage situations, evolving varieties for summer moong with synchronized maturity, removing seed constraint in <i>Sesbania</i> .	Farmers' participatory approach

4.	Decline in soil organic carbon	Coarse textured soils with high pH, faster microbial degradation, excess puddling, low moisture and high temperature in summer, cultivation of summer rice	Introduction of summer moong, enhanced use of FYM, green manure, promote 25% of total rice area under Basmati rice, use of leaf colour charts, slow-release fertilizers	Saturation of RCTs , Long-term trials to study soil organic carbon and fractionation of organic matter, INM
5.	Declining water table	Early transplanting of rice before the onset of monsoons, continuous flooding, pan formation and puddling reduces percolation of water	Avoid early transplanting, introduction of mechanical transplanter, irrigation at hair line crack formation but possible only under assured system of power supply and pre-planned canal water supply, avoid puddling where transplanting is done in the month of July.	Both types of research involving cropping system at research farms and at farmers' fields
C. Diversification				
1.	Reduced bio-diversity due to large area under monocultures without legumes	High risk associated with legume crops, more insect-pest problems in pulses, availability of high yielding varieties of crops other than pulses, public domain in favour of wheat and rice	Develop alternate strategy to introduce summer moong in the multiple land use system	Out source varieties of moong bean that fit in the summer cultivation between rice and wheat
2.	Intercropping of raya as intercrop in autumn planted sugarcane and as preceding crop for spring planted cane, zaid vegetables, fodder crop and even summer moong	Problem associated with sugar mill, area of sugarcane fluctuating in cyclic manner, economic of sugarcane as against RWCS and raya as against wheat., low productivity of sugarcane	Wean the area from post wheat planted sugarcane in May to autumn and spring planting Increasing Use of bed planters for autumn sugarcane based intercropping of rabi crops, reducing rice crop period to accommodate raya and increase the cropping intensity to 300%.	Farmers' participatory approach
D. Water management				
1.	Reduced water use efficiency	Poor rain and irrigation water management, poor land leveling, low power tariff, supply driven irrigation system, summer rice	Shifting transplanting to mid June, intermittent ponding, introduction of zero tillage, bed planting, laser land levelling and green manuring, improvement in percolation rate, introduction of micro-irrigation, water harvesting, introduction of watersheds, improvement in irrigation and canal operation schedules	Demonstrations, development and research
2.	Drainage congestion	Low-lying areas, excessive rain water, absence of water conservation measures	Introduce surface or sub-surface drainage, devise seeding techniques under relatively wet situations, develop varieties which can tolerate high moisture, bio-drainage	Research in bio-technology for developing varieties, more research on soil and water engineering
E. Integrated pest management				
1.	Weed management in wheat	Development of resistance in <i>P. minor</i> , cross resistance	Accelerated adoption of zero tillage, mechanized weeding using bed planting system, more competitive varieties,	Basic research on the mode and genetics of resistance, release of competitive varieties, monitoring of

			bringing 10% area at each farm level under alternate crops, rotation of herbicides of different chemistries, introduction of sunflower	resistance development
2.	Emergence of new pests	Availability of monoculture systems and intensive cropping	Intensive research on crop ecology and biological control, research on bio-technology	Basic research on ecology, biological control
G.	Vegetables			
1.	New management strategies among small holders vegetable farmers	Availability of hybrid seeds, costly hybrid seeds, availability of low water requiring vegetable varieties, intercropping of vegetables under multiple land use, Other cropping system with vegetables as catch crops.	Supply the quality of hybrid seed, marketing enhancement of vegetables, improved germplasm for garlic and onion, management of apical virus in potato	Improved germplasm research, farmers' participatory research on intercropping, technical and market information from different sources to farmers, relaying of production information from farmers to researchers, physical infrastructure for grading, processing and storage, electricity charges on the basis of agriculture for small unorganized food processors and mushroom growers

Table 11. Gap analysis, Strategies and Approaches for Allied Sector

S. No	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology
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
ii	Increased incidence of insect-pest and diseases	Poor management, 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
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
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 pulverised nursery raising in poly house

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology
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
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
3	Mushroom			
i	Poor quality of compost	Long method of compost preparation	Pasteurized composting on dry weight basis (subsidy)	Demonstration
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
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
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
ii	Imbalance feeding	Non availability of quality green fodder round 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
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

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology
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
5	Sheep and Goat			
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.
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.
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
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.
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.
ii	High mortality of juvenile 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.
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.
7	Poultry*			
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
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.

S. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology
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
8	Piggery*			
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.
ii	Poor stock	Rearing of animals of non descriptive breed.	Providing animals of suitable breed to the farmers.	Breed improvement campaign.
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
9	Forestry			
i	Shishem & Kikar mortality	Fungal infection	Survey and identification of causal organism.	Demonstration and trial through farmers' participatory approach

4.2 ZONE-II

Table 12. Gap analysis, Strategies and Approaches for Agriculture

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
A.	Wheat					
1.	Delayed sowing of wheat	i) Long duration kharif crops viz., Basmati rice, cotton and arhar; ii) Less availability of irrigation water	Ensuring early sowing of wheat through: i) Zero tillage ii) Development of short duration varieties of rice, cotton and arhar iii) Direct seeding of Basmati rice iv) Sufficient canal irrigation water supply v) Seed priming for early germination	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. The technology needs to be further developed for other cropping systems and other crops. Testing of novel seeders in preparation for its commercialization e.g. Happy seeders.	i) 70 per cent area to be sown upto 10 th Nov. ii) 20 per cent area to be sown upto 20 th Nov. iii) 10 per cent area to be sown upto 15 th Dec.	i) Zero tillage will help : a) Improving soil health including soil biology b) Improved environment c) Less water use d) More productivity e) Less problem of <i>P. minor</i> & decreased use of herbicides f) Reduced cost of cultivation g) Facilitates sowing under high soil moisture conditions ii) Higher yield iii) Quality produce
2.	Less adoption of seed treatment	i) Lack of awareness ii) Improper packing size of pesticides	To promote adoption of seed treatment with insecticides, fungicides and bio-fertilizers through awareness by trainings, demonstrations and mass campaigning .	Awareness of farmers regarding importance of seed treatment by the KVK and the State Department of Agriculture	Whole district with no compromise in termite affected areas	i) Decreased use of agro-chemicals ii) Reduced cost of cultivation iii) Eco-friendly

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
3.	Nutrient mining and increased incidence of multiple nutrient deficiencies	<p>i) Intensive farming</p> <p>ii) Imbalanced fertilizer use as in RWCS, average N ranges from 160-180 kg/ha and average P use is 57 kg/ha. Recommendation is 5:2:1 not 4:2:1</p> <p>iii) Inadequate availability/production of manures/compost for INM</p>	<p>Introduce more organic manures, more residue retention on surface, use of site specific micro-nutrient, use of N in three splits and use of first split just before 1st irrigation, integrated use of organic and inorganic sources of fertilizer</p> <p>generate recommendations based on the principle of site specific nutrient management. The optimal use of existing (indigenous) nutrients coming from soil, organic amendments, crop residue and irrigation water. Apply fertilizer to fill the deficit between crop needs and indigenous supply. Management of pest diseases and weed problems through more appropriate nutrient mgt.</p>	<p>Experimental research in different cropping systems, relook at soil test values, change in the recommendation of practice</p>	<p>Use of more sources of fertilizers in rice-wheat cropping system</p>	<p>The residue retention will help improving soil productivity, improved water permeability, decreased losses of nutrients</p>
4.	Varietal improvement	<p>No variety to tolerate terminal heat, short duration variety produces less yield</p>	<p>Varieties with stay green character near maturity, long duration varieties, varieties which can fit early sowing starting from 15th Oct. to manage terminal heat at maturity</p>	<p>Pre-breeding, work on hybrid wheat.</p>	<p>At least 75% area should be covered with varieties which can yield equal or more than WH 542 and PBW 343</p>	<p>More enhanced use of natural resources</p>

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
5.	Management of salinity & alkalinity	Decreased yield in the drought year because of life saving irrigations with brackish water in kharif crops	Avoid irrigation with brackish water in drought years because it leads to secondary salinity, wherever available make conjunctive use of water. Tolerance of current and improved varieties to salinity and sodicity needs further investigations. Work is also needed to adapt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability, profitability and yield.	Bajra-wheat, Arhar-wheat in the district Rohtak should be studied for long-term salinity and sodicity build-up due to water management in kharif season.	Problematic areas	Long-term productivity of wheat will sustain by proper water management in the system as a whole
6.	Weed management	❖ Complex wheat flora seriously affects wheat yield in non-rice wheat cropping system.	❖ Improve the efficiency of existing herbicides. ❖ Introduce new herbicides. ❖ Capacity building for spraying techniques.	State level strategic plan for the management of <i>Phalaris minor</i> . Capacity building of extension agencies and farmers for appropriate spraying techniques. Demons. of new herbicides	Whole area	Anticipated economic benefits are increased profitability, increased yield and increased food security.
B. Rice						
1..	Seed treatment	Bakane (foot rot) disease	Seed treatment with fungicides	Awareness of farmers regarding importance of seed treatment by the KVK and Dept. of Agriculture	Whole paddy growing area	Productivity growth on sustainable basis

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
2.	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
3.	Hybrids	Less number of hybrids in Basmati group, lodging in coarse rice hybrids	Increase area under hybrids in coarse 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
4.	Decline in soil organic carbon	Coarse textured soils with high pH, faster microbial degradation, excess puddling, low moisture and high temp. in summer.	Introduction of summer moong, enhanced use of FYM, green manure, use of leaf colour charts, slow-release fertilizers	Long-term trials to study soil organic carbon and fractionation of organic matter, INM	Whole rice area	Improved organic carbon content
5.	Reduced water use efficiency	Poor rain and irrigation water management, poor land levelling, low power tariff, supply driven irrigation system, boosting of summer crops cultivation	Shifting transplanting to mid June, intermittent ponding, introduction of zero tillage, , laser land levelling and green manuring, water harvesting, introduction of watersheds, improvement in irrigation and canal operation schedules	Demonstrations, development and research	Whole rice area	Savings in water, improved water use efficiency, better water-nutrient interactions

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
C. Cotton						
1.	Problem of Helicoverpa	Non-manageable due to polyphagous in nature, resistant to prevailing insecticides	Increase area under Bt cotton, monitoring of Bt cotton for resistance development, recommend agronomy for Bt cotton	More research is needed on agronomic management and resistance development, strategies to delay or avoid resistance development	80% area with assured irrigation	Better use of external inputs, less use of pesticides
2.	Quality seed	Non-descript Bt hybrids, poor quality seed	Better integration between public and private sector, double gene or triple gene Bt hybrids, better cycle of Bt upgrades, address problems that consumers may demand	More research on bio-technology, better understanding of IPR	The whole Bt cotton area	Provide higher yield with less pesticides, short crop duration thus enabling early wheat sowing
3.	Mealy bug	Availability of niches for carry over of pest	Precautionary measures for uprooting and burning, management of host and proper management strategies after occurrence	Integrated approach of good agronomic practices and monitoring	Whole cotton based cropping system	More productivity and long-term decline in pest population
4.	Plant population	Hot and desiccating winds at sowing	Bed planting, irrigation management, use of seed-cum-fertilizer drill	Research at experimental farm and at farmers field for crop establishment techniques	whole cotton area	Better use of inputs, high efficiency
5.	Mechanical picking	Less availability of labour, delayed 3 rd picking and late sowing of wheat	Synchronized boll opening for introducing mechanical harvester, introduction of mechanical seeding of wheat in standing cotton	Farmers' participatory approach and research in engineering workshops	Cotton growing areas	Better use of labour, improved productivity of whole cotton-wheat cropping system

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
D. Sugarcane						
1.	Intercropping of sugarcane with other crops	Lack of mechanized crop establishment	Use of bed planters for autumn sugarcane based intercropping of rabi crops	Farmers' participatory approach	Whole sugarcane area planted after wheat harvest can be brought forward for autumn planting and intercropping	More conservation of resources, multiple land use, getting more income per unit area
2	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.
E. Bajra						
1	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 fertiliser use every year	Increase in productivity
2	No proper weed management	Lack of mechanization in weed control, no post emergence weedicide available,	Educating farmers on the use of chemicals for the control of weeds	Trainings Demonstration, field days	10% growth in area every year	Increase in productivity
3	Intercropping		Motivation of farmers to adopt intercropping of guar in bajra for higher return	Demonstrations, trainings, seminars	10% growth in area every year	Multiple land use
F. Oilseeds						
1	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.	Whole district	Better utilization of resources.
2	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.

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
3	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.
G Arhar						
1	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
2	Less use of phosphatic fertilizers & bio- fertilizers	Grown on marginal lands, farmers do not use fertilizers due to uncertainty of the crop	Creating 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
3	Non availability high yielding, short statured 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
H. Fodder crops						
1	Less use of fertilizers particularly phosphatic fertilizers	Lack of awareness regarding fertilizer requirement of fodder crops like sorghum , cowpea, barseem, oats and maize.	Educating farmers on effect of fodder produced without P fertilizer Application on yield and animals health	Farmers participatory approach	10% growth on area every year	Increase in yield, improvement in animals health
2	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 2 villages should be selected as fodder seed village	Increase in fodder yield, milk yield
3	High incidence of grass hopper`	Lack of knowledge regarding grass hopper control measures	Campaign on control of grass hopper on community basis at breeding places	Campaign	Prone areas to be covered	Higher quality fodder yield

S.N.	Gap/Issue	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
<i>I. Guar</i>						
1.	Quality seed of improved varieties	Less use of certified seed	Non-availability of good quality seed.	Increase area under improved varieties for higher productivity.	Whole guar area should be covered with improved varieties.	Improvement in soil health High productivity.
2.	Integrated Nutrient Management	Guar is cultivated in low fertility soils.	Less use of phosphatic fertilizer, zinc sulphate and Rhizobium culture.	Ensure the availability of Rhizobium culture farmer's participatory approach for recommended fertilizer use.	Whole district	More productivity.

Table 13. Gap analysis, Strategies and Approaches for Allied Sector

Sr. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
A Dairy						
1	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
2	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 milk yield on sustainable basis.
3	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 veterinary 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

Sr. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
4	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
B Vegetable crops						
1	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
2	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 to 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
3	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 persistant 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
4	Imbalance use of fertilizers	Excessive use of nitrogenous fertilizers, less use of organic manures and micronutrients	Educate farmers on balanced use of fertilizer, importance of potash 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

Sr. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
C Fruit crops						
1	Poor planting material for fruit crops	Non-availability of quality grafts, lack of skilled nursery man/budders	Public/ private linkage for supply of high yielding quality grafts, development of skilled nursery men	Provision for supply of quality planting material , Training on propagation	50 ha area should be covered every year under quality planting material	Increase yield and profitability
2	Reluctance for pruning and training of fruit plants	Lack of awareness	Educate farmers regarding benefit of pruning	Trainings demonstrations, and farmers field school	50 ha area to be covered every year	Yield enhancement and quality improvement
3	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
4	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
D Mushroom						
1	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
2	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
3	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

Sr. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
E Beekeeping						
1	Poor seasonal management	Lack of awareness	Educate farmers on proper management of honeybees in different seasons	Training and demonstration	10% increase in no. of colonies every year	Increase in honey production
2	IPM	Lack of awareness, poor management	Educate farmers on enemies of honeybees and their management	Training and demonstration	10% increase in no. of colonies every year	Increase in honey production
F Social and Agro-forestry						
	Management strategies among tree growers	Availability of good planting material, improper distance among trees, intercropping of different crops	Nursery establishment of safeda, improved planting material.	Improved germplasm research, farmer participatory research on intercropping, awareness of farmers for proper spacing among trees and intercropping.	Whole district	Improved soil health, improved environment and more productivity on sustainable basis.
G Fishery						
1	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.
2	High mortality of juvenile 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.
3	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.
H. Poultry						
1.	Poor quality of day old chicks	Many Hatcheries are supplying infected day old chicks, leading to heavy mortality in first two weeks	Regular screening of breeding flocks by pullorum testing	Govt. of Haryana need to enforce this regulation	15 % growth in area if quality chicks is improved	Increase in production and profitability of farmers

Sr. No.	Gap	Factors/constraints leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability outputs
2.	Poor adoption of modern management and feeding practices	Unaware about proper brooding and latest feeding practices like pre-starter/starter finisher etc.	Education of farmers on these practices. Training and demonstration in farmer's participations approach	Education of farmers on these practices. Training and demonstration in farmer's participations approach	10 % growth in area if modern practices are followed	Increase in production and profitability of farmers
3.	Unaware about disease prevention and vaccination approaches	No pits for disposal of dead birds, do not adopt vaccination schedule	Education of farmers on these approaches, establishment of D.I. laboratory at district level.	Training and demonstration in farmer's participatory approach	10 % growth in area if modern practices are followed	Increase in production and profitability of farmers
4.	Lack of marketing facilities	Dependent on Delhi market, where rates keep fluctuating.	Need to develop suitable marketing facilities in Haryana e.g at Kundli	Govt. of Haryana need to be convinced on this aspect	15 % growth in area if MSP & marketing facilities are provided.	Increase in production and profitability of farmers

4.3 ZONE-III

Table 14. Gap analysis, Strategies and Approaches for Agriculture

S. No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology
1.	Management of salinity & sodicity	Indiscriminate use of brackish water	Avoid irrigation with brackish water in summer and drought years, because it leads to secondary salinization, wherever available make conjunctive use of water. Tolerance of current and improved varieties to salinity and sodicity needs further investigations. Work is also needed to adopt agronomic practices, especially the timing and amount of fertilizer and irrigation in order to increase ecological sustainability, profitability and yield.	Bajra-wheat, guar-wheat, pulses-wheat in SW Haryana should be studied for long-term salinity and sodicity build-up due to water management in kharif season.
2				
1.	Reduced water use efficiency	Poor rain and irrigation water management, poor land leveling, low power tariff, power supply dependent irrigation system	Introduction of zero tillage, bed planting, (in vegetables) laser land leveling and green manuring, introduction of micro-irrigation, water harvesting, introduction of watersheds, improvement in power supply schedules	Demonstrations, development and research
3				
a	Weed management in wheat	Complex weed flora	Accelerated adoption of zero tillage, mechanized weeding more competitive varieties	Release of competitive varieties, monitoring of resistance development
b	Orobanche in mustard	The monoculture of Indian mustard	Introduction of barley	Research on two-row barley, research on longevity of Orobanche
c	Emergence of new pests Aphid in wheat, barley, BLB in guar Blister beetle in cowpea and moong	Availability of monoculture systems and intensive cropping	Intensive research on crop ecology and biological control, research on bio-technology	Basic research on ecology, biological control

S. No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology
4	Weed management	Complex weed flora predominately <i>Chenopodium</i> seriously affects wheat yield in the district Wild oat and <i>Phalaris</i> are intruding with a rapid pace	Improve the efficiency of existing herbicides. Introduce new herbicides. Capacity building for spraying techniques. Ecological approaches including zero-tillage crop rotation.	Capacity building of extension agencies and farmers for appropriate spraying techniques. On farm demonstrations of new herbicides
5.	Nutrient mining & increased incidence of multiple nutrient deficiencies	Coarse texture of soil leading to poor retention of nutrients The 100 per cent soils of the zone are low in O.C. and P Poor residue retention	Introduce more organic manures, more residue retention on surface, use of site specific micro-nutrient, use of N in three splits and use of first split before 1 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 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.	Experimental research to work out fertilizer requirement of major cropping system in the district viz. Bajra-wheat, guar-wheat Bajra-mustard guar-mustard etc, re-look at soil test values, change in the recommendation of practice
6	Variety improvement	No wheat variety is tolerant to terminal heat, short duration varieties produce less yield	Varieties with stay-green character near maturity, long duration varieties, varieties which can fit early sowing starting from 15 th Oct. to manage terminal heat at maturity	Pre-breeding, work on hybrid wheat. Improvement in the grain size of WH 542

S. No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology
7.				
1.	Reduced bio-diversity due to large area under mono-cultures without legumes	Brackish water, saline, sodic soils High risk associated with legume crops, more insect-pest problems in pulses, Non-availability of high yielding varieties of crops other than pulses	Develop alternate strategy to intensify cultivation of guar and moong in kharif and gram in rabi in areas having limited but good quality water Intensification of barley cultivation Intercropping of Chicory with mustard	Demonstrations Research Extension & Dev. Agencies should join hands for the promotion of barley through varietal improvement and demonstrations
2	Intercropping of guar with castor	Lack of mechanized crop establishment and threshing of castor	Use of bed planters for castor sowing	Farmers' participatory approach

S. No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology
8				
a				
	<p>Less use of sulphur,</p> <p>No management of <i>Orobanche</i>,</p> <p>Supra optimal use of phosphorus, irrigation, high population density at closer spacing</p>	Lack of knowledge	<p>Balance use of fertilizer, efficient irrigation management\</p> <p>Maintaining proper plant density</p>	<p>Research on integrated nutrient management specially when farmers are using more Phosphorus than recommendation,</p> <p>Research on management of <i>Orobanche</i></p> <p>Need to relook the irrigation and spacing requirement</p> <p>Demonstrations on the use S, recommended P application and irrigation on critical stages</p>
b				
1	Seeding time	Unavailability of irrigation, Delayed harvesting of guar, cotton,	Zero tillage, short duration varieties of guar and cotton, regulation of electric power supply for irrigation	<p>Research, extension and development agencies should jointly approach in a farmers' participatory approach for each of possible solution.</p> <p>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 need 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>
2	Seed treatment	Termites, fungal diseases like loose smut, flag smut and Karnal bunt	<p>Seed treatment with insecticides, fungicides and bio-fertilizers.</p> <p>Seed priming, if sowing is delayed</p>	Awareness of farmers regarding importance of seed treatment by the University and the State Department of Agriculture

S. No.	Gap	Factors/ constraints leading to gaps	Strategies	Approach and methodology
C				
1.	Major thrust to consolidate the development of bajra hybrids with high yield potential	New hybrids from private sector have been introduced with unknown consequences leading to disease incidence	Main streaming of private sector and developing MOUs with private sector	Pre-breeding research at experimental stations
	Crop establishment	Risk in crop establishment due to crust formation	Use of ridger-seeder	Necessary modification in the machine for easy adoption
	Non adoption of basal P and N fertilization	Lack of awareness Uncertainty in crop establishment	Demonstration on P fertilization	Training and demonstrations Farmers' participatory approach
d				
	Poor or no fertilizer BLB and Aphid problem	Lack of awareness	Use of Phosphatic fertilizer, Seed treatment and spray against disease and insect	Training and demonstration -do-

Table 15. Gap analysis, Strategies and Approaches for Allied Sector

Sr. No	Gap	Factors / constraints leading to gaps	Strategies	Approach and methodology
1	New management strategies among small holders vegetable farmers	Availability of hybrid seeds, cost of hybrid seeds, availability of low water requiring vegetable varieties, intercropping of vegetables and multiple land use, vegetable based cropping system with intervening cultivation of flowers, intercropping of potato with mustard	Supply and quality of hybrid seed, marketing enhancement of vegetables, improved germplasm for garlic and onion, management of apical virus in potato	Improved germplasm research, farmers' participatory research on intercropping, technical and market information from different sources to farmers, relaying of production information from farmers to researchers, physical infrastructure for grading, processing and storage, electricity charges on the basis of agriculture for small unorganized food processors
2				
a	Planting material	Availability of planting material	Supply and quality of quality, planting material	Establishment of fruit nurseries at block level
b	Water management in vegetables and fruits	Poor availability of irrigation water and non adoption of micro irrigation system.	Supply of drip irrigation system	Demonstrations on drip irrigation
c	Area expansion of fruit trees	Small holding size Price slump in Aonla	Adopting Agri-horti system of farming by growing karonda-interspersed with Bael on field boundary of field crops/ orchard Agro-processing units for value addition	Demonstration on Agri-horti system Dept. of horticulture and developmental agencies to work in the direction of establishing Agro-processing units for value addition of Aonla for edible and medicinal and other products

Sr. No	Gap	Factors / constraints leading to gaps	Strategies	Approach and methodology
3	Forestry	Only 1.3% per cent area under forest cover	Afforestation of the denuded land	Massive afforestation and development of social forestry program
4	Animal Husbandry / Buffalo farming			
a	Imbalanced feeding	Lack of green fodder	Cultivation of green fodders	Demonstration, trainings supply of seed of fodder crops to the growers
b	Mineral deficiency induced disorders	Poor nutrient /micronutrient status of soil as well as feeds	Mineral mixture supplementation of the animal feed	Supply of mineral mixture to the buffalo /cattle farmers
c	Breed	Natural mating with non-descript bull	Strengthening A.I. facility, Community Bulls	Extension and development agencies A.H dept. should jointly approach in a farmers participatory approach
5	Poultry	Feeding, Housing Disease	Lack of awareness	Impart training
6	Vermi-composting			
7	Poor soil health	Low organic carbon, low P and micronutrients	Vermi-composting	Demonstration, trainings and exposure visits on vermin-composting
	Poor adoption	Lack of awareness	Scientific bee keeping	Demonstration, trainings and exposure visits on vermin-composting Development of bee keeping by establishing new units
		Non availability of flora during summer	Shifting to other places	

CHAPTER 5

SWOT ANALYSIS OF THE STATE

In order to capitalize on the opportunities and to convert weaknesses into opportunities it is required to visualize an alternate agricultural scenario from present to twenty years hence. In this endeavour, an in depth analysis of Strength, Weaknesses, Opportunities 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.

5.1 Management of Agricultural Crops

Strengths:-

- A good network of extension services
- Adequate extension services.
- Around 88 per cent area under cultivation is irrigated in Zone-I
- Assured input availability network in Zone-I
- Basic factors required for successful cultivation of major cereals are available.
- Dairy as an integral component of farming system
- Fertile and productive soils with about 88 % irrigated area. In Zone-I and II
- Financial help through banks and cooperative available.
- Good communication facilities at village level
- Good transport facilities through rail and road
- Ideally located in the vicinity of National Capital
- Light soils, easy to work i.e. ploughing, weeding in Zone-III
- Major farm machineries available at subsidized rates
- Marketing facilities for grain within 10 km.
- Mechanized farming gaining importance.
- No major problem of water stagnation in Zone-III

- Procurement policy for wheat and bajra
- Receptive farmers willing to adopt improved farm technologies.
- Soils are fit for intensive cultivation in Zone I and II
- Soils are quick to reach Field Capacity after irrigation or rain, facilitating timely sowing of the crops
- Sufficient agro-based industries like cotton mills, sugar mills and rice shellers in Zone-I and II
- Sufficient financial help through banks available
- Suitable agro climatic conditions for wheat, paddy, sugarcane, Arhar, Cotton, Raya, fruits and vegetables
- The proximity to the huge market of National Capital of Delhi with well established connectivity of roads and railway track.
- The Zone-I has a good network of tube wells with good quality water
- Well connected with national & state highways, subways

Weaknesses

- Around 65 % of the soils are affected with varying degree of salinity/sodicity in Zone-II and III
- Being NCR region, rapid diversion of cultivated lands for non agriculture uses
- Critical technological gaps in specific areas of crop production viz. seed treatment, balance fertilization and insect pest and disease management.
- Decreasing organic carbon.
- Depleting water table in large part of the State (receding @ 45 cm/annum)
- Inadequate availability of quality seeds (especially hybrid seeds) of various crops.
- Inadequate soils health management practices.
- Increasing deficiency of micronutrients (Zn, Fe, Mn) in soils
- Inefficient water management.
- Infestations of non-cropped area with carrot weed – a potential danger to animal and human health as well as bio-diversity.
- Lack of awareness on conservation technologies

- Lack of proper knowledge and indifferent attitude of farmers towards crucial farm/crop management practices/operations.
- Lack of water harvesting and management practices
- Light textured soils with poor retention of water and nutrients in Zone-II and III
- Low adoption level of FYM, green manuring and vermi-composting and crop/farm residue management.
- Low rain fall with erratic distribution
- More than 65 % of the underlain ground water are brackish in nature
- No availability of canal water in Zone-II and III
- No disincentive for excessive water and electricity use.
- Poor breeding, feeding and management of livestock practices
- Poor fertility of soils, low in organic carbon and phosphorus (100%).
- Poor management of cow dung & crop residues.
- Problem of salinity and sodicity in areas of poor underground water quality.
- Quality concern of farm inputs.
- Scanty and erratic rainfall in the State.
- Scarce and costly labour.
- Supra optimal use P fertilizer, irrigation water and plant density in mustard
- Technological gaps in practices of some crops
- Unavailability of labour during peak period of farm operations.

Opportunities

- Availability of raw material for food processing entrepreneurship
- Bridging yield gaps between average yield and attainable (successful farmer's yield) and FLDs yield
- Creation of network of custom hire services.
- Creation of subsidiary occupation to solve the problem of unemployment.
- Established and up coming marketing, agro-processing and ware housing/godown facilities
- Establishment of commodity based and/or technology based farmers association.

- Excellent rail and road connectivity
- Good information and communication system
- Good marketing infrastructure
- Immense scope for mixed/multiple cropping with higher income and employment generation.
- Improving information and communication technology (ICT) for real time extension.
- Improving the linkage and synergies with private sector, NGOs and other public sector organizations.
- Mechanization to solve the problem of labour.
- Multidisciplinary and farmers participatory approach to find solution for site specific problem/issues.
- Mustard by-product available in abundance which can be recycled as compost/vermi-compost for improving soil health
- Network of co-operatives
- Rising demand for milk and milk products, vegetables, flowers
- Scope for diversification in favour of Horticulture, Vegetable & Dairying.
- Scope for recycling of organic waste and improvement in soil health.
- Skill and knowledge up gradation through vocational training.
- State designated certifying agencies for specific food items like organic products.
- Suitable agro-climatic and edaphic conditions congenial for mustard and bajra. In Zone II and III
- Technologies available for sustaining natural resources health with increased efficiency of land, water and human resource.
- Vast opportunities prevail for profitable diversification of existing cropping pattern within crops and with non crop husbandry.

Threats

- Alarming depletion of ground water in khaddar region.
- Declining factor productivity and rising cost of cultivation especially in pre-

dominant paddy-wheat cropping system.

- Degrading soil fertility especially with declining status of potash and micronutrients.
- Disenchantment among young farmers towards agriculture as an occupation.
- Excellent rail and road connectivity
- Exploitation of brackish ground water deteriorating soil health
- Increased incidence of insect-pest and disease complex.
- Increasing farmers' inability to invest in agricultural production system
- Rising cost of cultivation of major crops
- Rising demand for milk and milk products, vegetables, flowers
- Rising salinity and water table in banger region.
- Suitable agro-climatic and edaphic conditions congenial for mustard and bajra.
- Unscientific and un-decomposed farm yard manure and organic farm waste management.
- Very less area under horticulture, pulses and oilseed crops
- Weeds and insects thriving on common lands and government lands.

5.2 Management of Horticulture Production

Strengths

- Favourable climate for production of different quality fruits (especially ber, guava, Aonla) and vegetable crops in Zone-II and III
- The proximity to the huge market of National Capital of Delhi with road and rail connectivity.
- Long tradition of cultivating specific vegetables.
- Favourable climate for production of different quality fruit (especially ber, guava, Aonla) and vegetable crops.
- The proximity to the huge market of National Capital of Delhi with road and rail
- Favourable climate for production of different quality fruits (especially ber, guava, Aonla, citrus) and vegetable crops.

- Good connectivity to the market of National Capital of Delhi with road and rail
- Suitable climate for cultivation of specific vegetables and flowers.

Weaknesses

- High transportation cost.
- Inadequate availability of quality seeds and planting material in time.
- Inefficient labour supply especially at crucial stages.
- Lack of cold storage facilities
- Lack of proper knowledge of farmers of modern production techniques, post harvest handling and marketing practices.
- Lesser availability of quality seeds and planting material in time.
- Non-availability of sufficient labour especially at crucial stages.
- Poor fertility light soils
- Poor quality of ground water
- Poor quality saline water

Opportunities

- Established and up coming cold storage and processing units in and around the district.
- Increased institutional support.
- Increasing urbanization and changing food habits with preference to fruits and vegetables.
- Proximity to National Capital offers excellent marketing opportunities to the national and international markets.

Threats

- i) Inefficient and less transparent marketing with monopoly of traders and multiple level of intermediaries.
- ii) Poor post harvest management and modern marketing facilities like cold

- storages/chains, pre-cooling and waxing centers.
- iii) Reducing arable area (main vegetable growing area of Rai, Kundli & G.T. road belt is fast turning into residential and commercial purpose)
 - iv) Weaker post harvest management and modern marketing facilities like cold storages/chains, pre-cooling and waxing centers.
 - v) Wide fluctuation in prices

5.3 Management of Natural Resources

Strengths

- Abundance of Solar energy, round the year
- Light soils, easy to manage
- Rich bio-diversity
- Climate and soils suitable
- Rich bio-diversity
- Fertile soil and water availability with option to raise variety of crops, plants and animals.
- Climate and soils suitable for growing quality crops.
- Rich bio-diversity
- Canal as well as tubewell irrigation facilities are available in the region
- Suitable climate and soil for cultivation of cash crops like cotton and sugarcane
- Fertile soil and water availability with option to raise variety of crops, plants and animals.

Weaknesses

- Coarse textured soils with poor nutrient and water retention
- Degradation of soil fertility due to continuous cropping without adequate replenishment.
- Depleting as well as rising water tables with salinity and water logging problem.
- Depleting water table
- Infestation of weeds, insect-pest and disease complex

- Infestation of weeds, insect-pest and disease complex.
- Lack of integrated approach on NRM, INM and IPM by the farmers of integrated approach on NRM, INM and IPM by the farmers

Opportunities

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

Threats

- General ignorance, casual approach towards degrading soil fertility and depleting water table.
- Imbalanced fertilizer use creating soil health problem and decrease in productivity
- Indiscriminate usage of Irrigation water leading to alarming decline of water table (in khaddar region) and soil salinity and water logging (in banger region).
- Injudicious and indiscriminate usage of agro-chemicals, polluting ground aquifers.
- Lack of proper soil and water testing (micro-nutrients and ground water quality) facilities in the district.

5.4 Management of Animal Husbandry

Strengths

- Ample marketing avenues of animal based products and by products in and around the district.
- Expanding poultry enterprise with promising income generation.
- Government backed disease management and breed up-gradation services.
- Predominant rearing of world fame murreh buffalo.

- Presence of viable milk marketing network through co-operative societies, private agencies and individual milk traders.
- Round the year green fodder production.
- Sheep, goat and pig rearing a popular enterprise among landless and poor sections of society.
- Traditional expertise in cattle rearing with almost every farm house hold possessing milch animals in varying numbers.
- Well established network of Government veterinary, health and A.I. facility with wide coverage.

Weakness

- High costs of feed, medicines/vaccines and chicks
- High mortality and poor growth in calves.
- Infertility and delayed calving
- Lack of proper management and feeding practices.
- Low availability of quality fodder production
- Low milk yield in buffalo and cows.
- Repeat breeding and long calving interval
- 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) Tremendous scope to raise on farm employment, income and increased availability of organic manure by substituting area under paddy-wheat in favour of fodder crops and there by raising dairy on same area.
- iv) Upcoming processing and exporting firms to provide additional fillip to various animal based allied activities.

Threats

- i) Disease outbreak (even in far off places) causes the panic in consumers and

producers suffer on account of crash in markets especially of poultry.

- ii) Frequent occurrence of diseases in sheep and goat
- iii) Increasing urbanization and high population pressure on land leads to less acreage under fodder production.
- iv) Maintaining traditional sheep and goat rearing methods
- v) Non descript poor graded bulls used for natural insemination.
- vi) 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.
- vii) Shrinking pasture lands

5.5 Management of Fisheries

Strengths

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

Weakness

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

Opportunity

- i) Ample scope for mobilizing untapped water resources such as water logged area, saline water and soil for aquaculture.
- ii) Greater opportunities for diversification of traditional fish culture and agriculture to culture of high value fish species such as mangur, sol, singhora, ornamental fish and prawn.
- iii) High cattle population releasing organic manures in pounds help in growth of natural food for fish.
- iv) Immense scope for fish seed (fingerlings) production to cater the needs of fish farmers of the state
- v) Provision of financial assistance for popularizing integrated fish farming with agriculture, horticulture, dairing, poultry, piggery and duckery.

Threats

- i) Absence of any reputed centre/source of fish feed, fisheries management institute.
- ii) High canal water charges (increased from Rs. 40/2500 per cubic feet to Rs 250/2500 per cubic feet)
- iii) High mortality in juvenile and adult fish
- iv) Lack of post harvest management practices by farmers
- v) Poor facilities for soil and water sample testing, disease diagnosis and post harvest infrastructures.
- 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 6

THE VISION

6.1. ZONE-I

The advent of 'Green Revolution' technology has facilitated substantial shifts in acreage in this zone towards rice and wheat with high level of crop intensification. The significant increases in the productivity of rice and wheat were brought about by technological interventions backed by effective price support and public stocking policies. These developments put the region's agriculture on high growth path resulting into fast increase in the area under rice and wheat crops not only by substituting other crops but also through horizontal and vertical expansion in the cultivated area. The area under *jowar*, *bajra*, maize, barley and gram came down, however, **the area under rice and wheat increased in these years.**

Of late, the economic and ecological sustainability of rice-wheat cropping system (RWCS) of the zone is being questioned. There are concerns about the depletion (as well as rising) of ground water level, degradation in soil fertility, rising problems of insect-pest and disease complex, decline in bio-diversity, rising costs and diminishing economic returns, decline in factor productivity, fragmented small holdings and narrow economic base of the farmers. In view these concerns, farmers of the district started attempting, especially during mid eighties, to enlarge the concept of crops and animal husbandry (being practiced by them since long). The enlargement was tried by incorporating poultry, fishery, piggery, vermiculture, beekeeping, vegetables and mushroom cultivation etc. Notable successes are instances of integration of vegetable and mushroom cultivation. Community fish farming has been successful due to govt. support. The majority of the farmers are experiencing low productivity and profitability of crops. Such experiences have not quantified in other enterprises but there are a large number of failures due to lack of sufficient knowledge and skill in the farmers attempting to get into new ventures. There is also limited experience of exposure visits to fellow farmers who

have successfully adopted the new enterprises along with crops.

For vast majority of small holdings prevailing in the zone integrated farming system approach especially with multiple crop husbandry in integration with one or two allied enterprise with market potential is the sure way for optimum utilization of limited resources. It will generate sustainable income in tune with national goal ensuring food security and exploring markets (both within and out side the country).

Within the cropping system the factor productivity has been improved by improvement in the water, energy and labour efficiency. The emphasis would be to increase the margin of returns per unit of output. The components, like water productivity, energy efficiency and reduction in labour use have to be targeted along with the requirement of 4% productivity growth rate per year. There exists high potential for increasing the yield rates of these enterprises as the gap between present productivity and the attainable yield and potential yield is quite large in the district. The existing infrastructural facilities, easy access to big markets and up-coming processing facilities in and around the eight districts are added advantage for the farmers of this zone. In the light of prevailing agricultural scenario (with its roots in past and head in future) the following vision of the zone was evolved through participatory methodology.

6.2 ZONE-II

The zone is pre-dominantly known for cultivation of cotton, however, there is remarkable area under rice, bajra, guar, *arhar* and sugarcane. In *rabi* season, wheat, raya and gram are cultivated in this region.). 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 Gujarat 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 advent of 'Green Revolution' technology has facilitated substantial shifts in acreage in this zone towards rice and wheat with high level of crop intensification. The significant increases in the productivity of rice and wheat were brought about by technological interventions backed by effective price support and public stocking policies. These developments put the region's agriculture on high growth path resulting into fast increase in the area under rice and wheat crops not only by substituting other crops but also through horizontal and vertical expansion in the cultivated area. The area under sugarcane, jowar, bajra, and gram came down, however, **the area under rice, guar, wheat and barley increased in these years.**

The rice-wheat cropping system (RWCS) of the zone is economically viable. The farmers are getting more income per unit area from RWCS due to remunerative prices of both the crops. There are concerns about the depletion (as well as rising) of ground water level, degradation in soil fertility, rising problems of insect-pest and disease complex, decline in bio-diversity, rising costs. The farmers have made a shift towards subsidiary enterprises like poultry, fishery, piggery, vermiculture, beekeeping, vegetables and mushroom cultivation etc. There is increase in the area under horticulture and floriculture. Community fish farming has been successful due to govt. support. The majority of the farmers are experiencing low productivity and profitability of crops. Such experiences have not quantified in other enterprises but there are a large number of failures due to lack of sufficient knowledge and skill in the farmers attempting to get into new ventures. There is also limited experience of exposure visits to fellow farmers who have successfully adopted the new enterprises along with crops. The concept of animal husbandry is being practiced since long back Rohtak district is the breeding tract of world fame murrah buffalo. Dairy is a successful enterprise of the region.

For vast majority of small holdings prevailing in the zone integrated farming system approach especially with multiple crop husbandry in integration with one or two allied enterprise with market potential is the sure way for optimum utilization of limited

resources. It will generate sustainable income in tune with national goal ensuring food security and exploring markets (both within and outside the country).

Within the cropping system the factor productivity has been improved by improvement in the water, energy and labour efficiency. The emphasis would be to increase the margin of returns per unit of output. The components, like water productivity, energy efficiency and reduction in labour use have to be targeted along with the requirement of 4% productivity growth rate per year. There exists high potential for increasing the yield rates of these enterprises as the gap between present productivity and the attainable yield and potential yield is quite large. The existing infrastructural facilities, easy access to big markets and up-coming processing facilities are added advantage for the farmers of this zone.

6.3 ZONE-III

The Zone-III has witnessed substantial shifts in acreage under wheat and high level of crop intensification due to adoption of high yielding varieties and hybrid with the advent of Green revolution. This was the period, when a large number of tube wells for irrigation in the district mushroomed with the advent of rural electrification. The significant increases in the productivity of wheat and mustard was brought about by technological improvements/ interventions backed by effective price support and public stocking policies. These developments put the region's agriculture on high growth path resulting into fast increase in the area under wheat crop. However, in the recent past the economic and ecological sustainability of the existing farming system of the district is in doldrums. There are wide concerns about the depletion of ground water level, degradation in soil fertility, rising problems of insect-pest and disease complex, decline in bio-diversity, stagnation in yields, rising costs and diminishing economic returns, decline in factor productivity, fragmented small holdings and narrow economic base of the farmers.

Considering the unique situation of small fragmented holdings, lack of capital investment, necessity of recycling, year round employment, risk avoidance and concerns mentioned above, the farmers of the district started attempting, especially during mid eighties, to broaden the concept of crops and animal husbandry (being practiced by

them since long) by incorporating poultry, fish, vermi-culture, bee-keeping, vegetable growing, horticulture and floriculture. This concept of multiple uses of inputs and recycling principle was inadvertently put in practice based on traditional knowledge, inefficient integration and without proper market orientation. Sporadic success was achieved by relatively small number of farmers, as the approach of crop enterprise concentration moved towards integration of some other enterprises. Notables are instances of integration of vegetable, floriculture, horticulture, where farmers have achieved commendable success, otherwise, majority of the farmer are experiencing low productivity and profitability because of lack of knowledge, inefficient integration without farming system technologies, which include modern farm management skills that enable farmers to improve the efficiency, increase cropping intensity and to integrate and diversify into more high value commodities/enterprises in conformity with market trends.

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

The ever increasing cost of production and dependency on purchased inputs can effectively be controlled by adopting this approach through enhanced use efficiency of different critical inputs in crop enterprises with judicious combination of one or more allied enterprises complimenting each other through effective recycling of residues, wastes, byproducts or the products itself. The allied enterprises are important part of the farming systems. Both price and income elasticity of demand for most of these enterprises' products is high. There is wide chasm between demand and supply of these products. There exists high potential for increasing the yield rates of these enterprises, as the gap between present productivity (in the district) and the achievable yield and

potential yield is quite large. The prevailing infrastructural facilities, easy access to big markets and up-coming processing facilities in and around the district are added advantage for the farmers of this district.

6.4 Vision Statement

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

6.5 Priority Setting for the Zones

ZONE-I :

During 1970s and 1980s the green revolution technologies provided strong motivation to diversify crop sector in favour of high yielding cultivars of wheat and paddy in the zone. Now the problem resulting from the same technology and near exhaustion of its growth potential coupled with other factors are pressing for another diversification in the district. Practically, little scope exists for a major shift towards diversification but its steady pace since 1980s needed to be maintained more specifically in the light of new opportunities. **By adopting a system approach the predominant paddy- wheat cropping system with buffalo has to be intensified by incorporating some new crops within the system (like summer moong) or diversify a little towards vegetable crops, mixed cropping and multiple cropping involving other existing crops.** The zone enjoys the advantages of availability of green fodder, efficient system of rural transport and road network to more rigorously promoting commercial dairy , mushroom , poultry, fish farming , sheep- goat and pig farming. The zone also have location wise advantage of being near to the large metropolis of Delhi which offers vast consumer market for the agri- produces discussed herein. This kind of expansion will also be beneficial for improving soil health through increased availability of organic manure. Here, it is also to be understood that the increased adoption of less land using enterprises mentioned above are not the only solution, cutting cost and increasing the productivity is the best way to sustain the growth in agriculture and allied sectors. Following are the

issues required to be taken up on priority :-

- ✓ Water resource conservation and management
- ✓ Soil health improvement
- ✓ Popularizing resource conserving technologies
- ✓ Systematic shift from and/or integration of single crop enterprise to multiple cropping and intercropping
- ✓ Intensification of crop husbandry with vegetable and horticultural crops, animal husbandry, mushroom cultivation and other non crop based farming
- ✓ Bridging yield gaps of crops, animals and other enterprises
- ✓ Human resource development of rural youths, farm women, other disadvantaged groups and field staff
- ✓ Paradigm shift from production oriented farming to market oriented agriculture

ZONE-II

Priority setting for the zone

- ✓ Promotion of dairying
- ✓ Diversification in agriculture through mushroom cultivation, beekeeping, vermi-composting, value addition and growing of horticultural crops
- ✓ Management of problematic soils
- ✓ Resource conservation through zero tillage, vermi-composting and green manuring
- ✓ Introduction of employment generation enterprises especially for women
- ✓ Promotion of fodder production
- ✓ Promotion of sugarcane based cropping system
- ✓ Integrated nutrient management (INM)
- ✓ Integrated pest management (IPM)

ZONE-III :

To attain the objectives of output expansion, employment generation and natural resources sustainability, agricultural diversification has emerged as an important strategy. The studies conducted in developing countries as well as in India indicated agricultural diversification as a major tool for economic growth. Different studies on diversification have also shown that at micro level, a shift towards high value crops had benefited not only the farmers/grower, but the poor also, by directly raising agricultural productivity and generating additional employment. The pace of diversification in a district/region, however, depends upon the opportunities for diversification and responsiveness of the farmers to these opportunities.

In Zone-III during 1970s and 1980s the green revolution technologies provided strong motivation to diversify crop sector in favour of high yielding cultivars of wheat, pearl millet and mustard. The average profits of farmers of Rewari district can be increased by adoption of less water requiring crops such as Sikkar onion in vegetable crops, fenugreek in spices, barley, clusterbean in field crops, flowers, mushroom cultivation, bee keeping etc. at an increased level. Intensification of mustard + chicory (for seed), Intercropping of mustard with potato on beds, and multiple cropping with karonda interspersed with Bael at boundary of field crops/horticultural crops can prove economic cropping system.

Priority Setting

- ✓ Safe use of brackish water
- ✓ Drip irrigation in fruit plants and vegetable crops
- ✓ INM and accelerated adoption of vermi-composting
- ✓ Promotion of less water requiring crops including ber, aonla, barley, guar etc.
- ✓ Bridging yield gaps of crops, animals and other enterprises
- ✓ Conservation Agriculture including improvement in water productivity and surface maintained residue
- ✓ Popularizing mineral mixture in animal ration
- ✓ Income generating activities for rural masses.

CHAPTER 7

RECOMMENDED INTERVENTIONS FOR AGRICULTURE AND ALLIED SECTORS

Intervention recommended for the state (As per RKVY Guidelines, i.e. Stream I and Stream II)

The study and analysis of the prevailing agri-economic scenario (presented earlier) paved the way for recommended interventions for development of agriculture and allied sectors in the state. There is need for site-specific nutrient management, amelioration of salt affected soils, drainage and resource conserving technologies among others.

Suggested interventions proposed herein are as per guidelines for RKVY, i.e. in two distinct streams. The specific projects with clear objectives on the focus area are proposed to provide necessary fillip for agriculture and allied sectors development under Stream I. Under Stream II, the proposed activities are aimed at strengthening the existing state sector extension schemes and filling resource gaps.

The proposed specific projects and strengthening of state sector activities centered around the following focus areas :

- Site-specific nutrient management
- Amelioration of 0.23 m ha of alkali soils
- Adoption of resource conserving technologies, i.e. zero-tillage, laser levelling, planters, rotavators, etc.
- Sub-surface drainage in about 49000 ha saline areas.
- Natural resource management and conservation
- Farming system approach with emphasis on integration of crop husbandry with allied enterprises.
- Diversification of rice-wheat
- Human Resource Development and knowledge upgradation

- Development and integration of live-stock, poultry, fisheries, mushroom, beekeeping, etc.
- Value addition and marketing

Major projects under Stream I common to the state

A. Agriculture sector

- Strengthening of Training Centre at :
 - District level (KVK)
 - Block level (FIAC)
 - Strengthening of lab/ units
 - Strengthening of veterinary hospitals/ kits
- Amelioration of water logged & saline soils
- Proposal for Establishment of Pesticide Testing Lab. at Gurgaon
- Rain water harvesting
- Reclamation of Alkali soils
- Improving soil health through Green Manuring
- Introduction of Summer Moong
- Laser levelling
- Seed production of
 - Wheat
 - Paddy

B. Allied sectors

- Horticulture Seed production of
 - Carrot
 - Onion
 - Potato
- Animal Husbandry
 - Conservation of Murrah buffalo by supplying bulls
 - Supplementing Mineral Mixture
 - Deworming
 - Farm & Animal disposal Pits
- Vermi-composting

- Bee Keeping
- Agro Forestry and social forestry development
 - Development of Panchayat Land
- Installation of SPV pumps
- Monitoring and Evaluation

Major activities under Stream II common to the state

A comprehensive package of extension activities, site specific input management along with infrastructural support (by means of special project) that are vital for increasing farm income, productivity and employment and setting the ground for evolution of a 'second Green Revolution' in the district is recommended herewith. The main ingredients of package under Stream II are:

- Capacity building and skill upgradation of farmers to broaden their knowledge base
- Propagating resource conservation technologies
- Popularising new technologies and farm practices through demonstrating-
- Area specific improved varieties, hybrids and GM seeds
- Demonstrations on INM, IPM with a shift in focus from fertilizer nutrients and chemical usage per se to judicious application
- Organise train and link farmers to domestic and international markets in PPP frame work

The above mentioned activities are to be carried out through trainings, demonstrations, on farm trials, campaigns, exposure visits, group formation, farm schools, etc.

Table 16. Major Activities within the ambit of RKVY

Sr. No.	Activities	Sr. No.	Activities	Sr. No.	Activities
1	Strengthening of training Infrastructure at KVK	12	Horticulture Seed production	23	Conservation of village pond
2	Strengthening of training Infrastructure at Block Level	13	Conservation of Murrah buffalo	24	Providing community bulls
3	Strengthening of training Labs	14	Supplementing Mineral Mixture	25	Honey processing units
4	Strengthening of Vet. Hospitals	15	Deworming	26	Mushroom units
5	Amelioration of water logged & saline soils	16	Farm & Animal disposal Pits	27	Mushroom processing units
6	Rain water harvesting	17	Vermi-composting	28	Food preservation units
7	Reclamation of Alkali soils	18	Bee Keeping	29	Milk products units
8	Improving soil health through Green Manuring	19	Agro Forestry & Hort.	30	Commercial dairy units
9	Introduction of Summer Moong	20	Laser levelling	31	Development of Panchayat Land
10	Seed production , IPM and INM	21	Mechanisation in Agriculture	32	Improving the efficiency of irrigation through underground pipelines
11	Training, Demonstration, FFS and Group formation	22	Value addition through intercrops	33	Increase in cropping intensity

CHAPTER 8

TARGETS FOR THE PLAN PERIOD

8.1 Zone-I

Table 17. Targets of Agriculture Sector in Penultimate Year of the RKVY (2011-12)

Crop	Particulars								
		Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonapat
Rice	Area (ha)	12000	75000	115000	60000	160000	155000	70000	65000
	Prod.(000q)	54.4	312000	535	277	8320	666.5	2800	2307.6
	Prod. (q/ha)	9.24	41.6	48.7	46.2	52.0	43.0	40.0	35.5
Wheat	Area (ha)	13400	83000	114000	67000	175000	180000	80000	137000
	Prod.(000q)	61	39650	602	305	8050	7560	4000	7124
	Prod. (q/ha)	9.1	47.8	54.7	45.5	46.0	42.0	50.0	52.0
Sugarcane	Area (ha)	-	13000	15000	40000	14000	4000	9000	10000
	Prod.(000q)	-	7667	12800	30000	11200	2800	7200	8000
	Prod. (q/ha)	-	589.8	852	750	800	700	800	800.0
Raya	Area (ha)	-	9000	-	-	-	-	2000	9000
	Prod.(000q)	-	144	-	-	-	-	30.0	144.6
	Prod. (q/ha)	-	16.0	-	-	-	-	15.0	16.0
Arhar	Area (ha)	-	-	-	-	-	-	-	12000
	Prod.(000q)	-	-	-	-	-	-	-	264.0
	Prod. (q/ha)	-	-	-	-	-	-	-	22.0
Summer Moong	Area (ha)	-	-	10000	-	8000	5000	10000	6000
	Prod.(000q)	-	-	70.0	-	52.0	30.0	70.0	30.0
	Prod. (q/ha)	-	-	7.0	-	6.5	6.0	7.0	5.0
Bajra	Area (ha)	-	-	-	-	-	13000	-	10000
	Prod.(000q)	-	-	-	-	-	247.0	-	250.0
	Prod. (q/ha)	-	-	-	-	-	19.0	-	25.0
S.flower	Area (ha)	-	15000	8000	5000	6500	-	-	-
	Prod.(000q)	-	2900	14	10	120	-	-	-
	Prod. (q/ha)	-	19.3	18.2	20.0	18.5	-	-	-
Sorghum fodder	Area (ha)	-	-	-	-	15000	-	16000	14000
	Prod.(000q)	-	-	-	-	3300	-	-	4200
	Prod. (q/ha)	-	-	-	-	220	-	-	300
Veg.	Area (ha)	26000	21620	25000	13000	23000	2500	20000	24730
	Prod.(000q)	301820	307843	21250	-	-	-	-	-
	Prod. (q/ha)	116	-	850	-	-	-	-	-
Fruits	Area (ha)	15000	1320	1500	7300	2000	1000	1000	1015
	Prod.(000q)	7500	15705	1200	-	-	-	-	-
	Prod. (q/ha)	50	-	800	-	-	-	-	-
Cotton	Area (ha)	-	-	-	-	-	7000	-	-
	Prod.(000q)	-	-	-	-	-	70.0	-	-
	Prod. (q/ha)	-	-	-	-	-	10.0	-	-
Cropping Intensity	(%)	180	-	200	200	210	200	225	-
Zero Tillage in Wheat	Area (ha)	-	-	25000	15000	17000	60000	15000	-
Green manuring in RWCS	Area (ha)	10000	-	50000	30000	35000	100000	40000	-

Prod. –Production, Prod. –Productivity, Veg. - Vegetable crops, S.flower – Sunflower

8.2 ZONE-II

Table 18. Targets of Agriculture & Allied Sectors during the plan period

Crop	Particulars	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Rice	Area (000 ha)	55	-	-	111	15	31
	Prod. (000 q)	1127	-	-	3110	335	1147
	Prod. (q/ha)	20.5	76.49	-	28.0	22.3	37
Wheat	Area (000 ha)	568	-	-	217	97.5	103
	Prod. (000 q)	27150	-	-	10520	4700	5047
	Prod. (q/ha)	47.8	53.8	-	48.5	48.3	49
S. cane	Area (000 ha)	-	-	-	-	13	6
	Prod. (000 q)	-	-	-	-	1000	360
	Prod. (q/ha)	-	716.4	-	-	77	60
Raya	Area (000 ha)	57	-	-	10	16	3.5
	Prod. (000 q)	969	-	-	180	296	63
	Prod. (q/ha)	17.0	17.85	-	18.0	17.5	18.0
Arhar	Area (000 ha)	-	-	-	-	12.5	9.5
	Prod. (000 q)	-	-	-	-	180	123.5
	Prod. (q/ha)	-	-	-	-	14.4	13.0
Bajra	Area (000 ha)	3	-	-	47	18	9
	Prod. (000 q)	75	-	-	990	468	180
	Prod. (q/ha)	25	28.86	-	21.0	26	20.0
Cotton	Area (000 ha)	180	-	-	48	10	-
	Prod. (000 q)	2700	-	-	1830	85	-
	Prod. (q/ha)	15	9.96	-	6.50	8.5	-
Sorghum fodder	Area (000 ha)	-	-	-	25.0	25.2	63.4
	Prod. (000 q)	-	-	-	7500	7300	3804
	Prod. (q/ha)	-	272	-	300	290	600
Guar	Area (000 ha)	100	-	-	-	-	-
	Prod. (000 q)	1500	-	-	-	-	-
	Prod. (q/ha)	15	-	-	-	-	-
Summer moong	Area (000 ha)	-	-	-	5	-	-
	Prod. (000 q)	-	-	-	22	-	-
	Prod. (q/ha)	-	6.0	-	4.4	-	-
Barley	Area (000 ha)	12	-	-	-	2	-
	Prod. (000 q)	480	-	-	-	60	-
	Prod. (q/ha)	40.0	--	-	-	30.0	-
Gram	Area (000 ha)	7	-	-	2	2.1	-
	Prod. (000 q)	77	-	-	20.2	22.3	-
	Prod. (q/ha)	11.0	-	-	10.1	10.6	-
Veg.	Area (000 ha)	-	-	-	1.10	1.65	-
	Prod. (000 q)	-	-	-	1540	582.1	-
	Prod. (q/ha)	-	165.18	-	140.0	376.7	-
Fruits	Area (000 ha)	-	1490	-	1.50	1.1	-
	Prod. (000 q)	-	-	-	135.0	252.8	-
	Prod. (q/ha)	-	-	-	150.0	213.3	-
Flowers	Area (000 ha)	-	-	-	0.20	-	-
	Prod. (000 q)	-	-	-	220.0	-	-
	Prod. (q/ha)	-	-	-	110.0	-	-
Buffalo	No. (in lacs)	-	-	-	1.20	1.18	0.8
	Annual milk prod. (million litres)	-	-	-	342.0	356.0	219.0
	Av. Daily milk yield (litres)	-	-	-	8.20	8.28	7.5

Prod. -Production, Prod. -Productivity, S. cane - Sugarcane, Veg. - Vegetable crops

8.3 ZONE-III

Table 19. Targets of Agriculture Sector in Penultimate Year of the RKVY (2011-12)

Crop	Particulars	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Rice	Area (ha)	12000	2780	17000	9200	-	-
	Prodn.(000q)	23.4	105640	35.12	25990	-	-
	Prod. (q/ha)	19.5	-	20.66	28.25	-	-
Wheat	Area (ha)	125000	55820	85100	98500	45000	45000
	Prodn.(000q)	500	258.4	383.2	393.0	209.0	228.73
	Prod. (q/ha)	40.0	-	45.11	40.0	46.6	50.83
Raya	Area (ha)	150000	19920	62000	38000	96000	70000
	Prodn.(000q)	210	-	64.35	534.61	145.0	1248800
	Prod. (q/ha)	14	-	10.38	15.80	15.2	17.84
Arhar	Area (ha)	-	-	12000	-	-	-
	Prodn.(000q)	-	-	11.66	-	-	-
	Prod. (q/ha)	-	-	9.72	-	-	-
Barley	Area (ha)	20000	-	-	-	-	5000
	Prodn.(000q)	64	-	-	-	-	176800
	Prod. (q/ha)	32	-	-	-	-	3536
Bajra	Area (ha)	170000	33120	26800	27000	98000	55000
	Prodn.(000q)	213	705456	40.92	49950	148	866250
	Prod. (q/ha)	12.5	-	15.27	18.50	15.2	15.75
Guar	Area (ha)	80000	-	-	-	-	-
	Prodn.(000q)	72	-	-	-	-	-
	Prod. (q/ha)	9	-	-	-	-	-
Gram	Area (ha)	75000	-	7000	-	8000	-
	Prodn.(000q)	66	-	5.92	-	8000	-
	Prod. (q/ha)	8.8	-	8.46	-	9.8	-
Summer mung	Area (ha)	-	-	6000	-	-	-
	Prodn.(000q)	-	-	24.0	-	-	-
	Prod. (q/ha)	-	-	4.0	-	-	-
Sorgum fodder	Area (ha)	6000	-	27000	-	-	-
	Prodn.(000q)	150	-	8.88	-	-	-
	Prod. (q/ha)	250	-	3.29	-	-	-
Hortl. crops (+ vege.)	Area (ha)	257.45	-	700	257.45	-	-
	Prodn.(000q)	366	-	-	-	-	-
	Prod. (q/ha)	-	-	-	-	-	-
Cotton	Area (ha)	35000	-	-	-	-	-
	Prodn.(000q)	15.5	-	-	-	-	-
	Prod. (q/ha)	4.40	-	-	-	-	-
Cropping Intensity	(%)	210	210	200	200	210	200
Animal Husbandry							
Eggs	Lacs	-	-	-	-	-	93
Broilers	Nos.	-	-	-	-	-	610000
Meat	Kg	-	-	-	-	-	250315

Prodn. –Production, Prod. –Productivity, S. cane – Sugarcane, Veg. - Vegetable crops, S.flower – Sunflower

CHAPTER 9

BUDGET OUTLAY (RS. IN LACS) FOR SAP DURING THE PLAN PERIOD

ZONE-I

Table 20. Budget Outlay for SAP (Rs. In lacs) during the plan period (2007-08)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Agriculture	503.76	840.45	1842.0	2128.98	2223.8	850.18	956.75	581.4
Horticulture	230.36	6.0	46.05	154.75	25.6	54.92	122.0	81.94
Forestry	2	-	110.0	9.0	-	5.96	44.0	2.8
Animal Husbandry	32.6	-	-	10.80	607.5	200.12	161.5	30.7
Fisheries	1.1	115.0	110.0	4.00	-	1.28	74	6.9
Innovative schemes/ Specific Projects	0.25	38.15	-	191.16	-	616.25	336.5	2426.34
Sub Total	770.07	999.6	2108.05	2498.70	2856.9	1728.71	1694.75	3130.8

Table 21. Budget Outlay for SAP during the plan period (2008-09)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Agriculture	276.66	825.9	2074.5	2427.38	2223.8	919.11	956.75	587.4
Horticulture	233.6	6.0	211.05	266.50	25.6	55.06	122.0	85.3
Forestry	2.0	-	110.0	9.0	-	5.96	64.0	2.8
Animal Husbandry	32.6	960.0	1140.0	18.50	607.5	355.36	161.5	30.7
Fisheries	1.1	135.0	110.0	4.00	-	1.28	74	6.9
Innovative schemes/ Specific Projects	0.25	40.15	-	607.90	-	894.75	317.95	1518.5
Sub Total	546.21	1967.05	3645.55	3333.29	2856.9	2231.52	1696.2	2231.6

Table 22. Budget Outlay for SAP during the plan period (2009-10)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Agriculture	282.96	881.85	1840.5	2624.98	2223.8	1034.51	956.75	603.0
Horticulture	235.36	6.0	51.05	329.50	25.6	61.70	122.0	87.81
Forestry	2.0	-	110.0	9.0	-	5.96	584.0	2.8
Animal Husbandry	32.6	1097.0	1287.0	25.00	607.5	461.29	161.5	30.7
Fisheries	1.1	160.0	110.0	4.00	-	1.78	74	6.9
Innovative schemes/ Specific Projects	0.25	41.15	283.0	231.38	-	1179.25	600.95	1483.19
Sub Total	554.27	2186.0	3681.55	3223.87	2856.9	2744.49	2499.2	2214.4

Table 23. Budget Outlay for SAP during the plan period (2010-11)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Agriculture	284.76	924.05	1838.0	3076.59	2223.8	1090.03	956.75	607.2
Horticulture	237.76	6.0	51.05	375.75	25.6	68.06	122.0	90.86
Forestry	2.0	-	110.0	9.00	-	5.96	104.0	2.8
Animal Husbandry	32.6	1225.0	1430.0	31.00	607.5	548.64	161.5	30.7
Fisheries	1.1	180.0	140.0	4.00	-	1.78	81	6.9
Innovative schemes/ Specific Projects	0.25	43.15	-	240.38	-	651.25	318.25	1542.74
Sub Total	558.47	2378.20	3569.05	3736.73	2856.9	2365.72	1743.5	2281.2

Table 24. Budget Outlay for SAP during the plan period (2011-12)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat
Agriculture	288.06	1000.75	1838.0	3169.52	2223.8	1189.04	956.75	615.7
Horticulture	240.46	6.0	51.05	420.85	25.6	72.15	122.0	93.94
Forestry	2.5	-	110.0	9.00	-	6.05	124.0	2.8
Animal Husbandry	32.6	1365.0	1585.0	38.00	607.5	637.65	161.5	30.7
Fisheries	1.1	210.0	140.0	4.00	-	1.78	82	6.9
Innovative schemes/ Specific Projects	0.36	43.15	-	252.09	-	473.75	318.25	1573.56
Sub Total	565.08	2624.9	3724.05	3893.40	2856.9	2380.42	1764.5	2323.6

Table 25. Total Budget Outlay for SAP (Rs. In lacs) Zone-I during the plan period (2007-08 to 2011-12)

Stream	Panchkula	Ambala	Kurukshetra	Yamunanagar	Karnal	Kaithal	Panipat	Sonipat	Total
Agriculture	1636.2	4473.0	9433.0	13727.43	11119.0	5082.87	4884.25	2994.7	52617.25
Horticulture	1181.54	30.0	410.25	1547.35	128.0	311.89	610.0	439.85	4658.88
Forestry	10.5	-	550.0	45.00	-	29.89	920.0	14.0	963.89
Animal Husbandry	163.0	4647.0	5442.0	12.30	3037.5	2203.06	807.5	153.5	16465.86
Fisheries	5.5	800.0	610.0	22.00	-	7.9	385.0	34.5	427.4
Innovative schemes/ Specific Projects	1.36	205.75	283.0	1332.89	-	3815.25	1891.7	8544.33	14251.28
Grand Total	2998.1	10155.75	16728.25	16686.98	14284.5	11450.86	9498.45	12180.88	93983.77

ZONE-II

Table 26. Budget Outlay for SAP (Rs. In lacs) during the plan period (2007-08)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Agriculture	245.54	645.19	761.55	894.80	408.82	422.05
Horticulture	3.5	54.61	1.5	3.00	77.15	20.07
Forestry	1.0	7.35	2.0	1.00	8.5	14.60
Animal Husbandry	525.8	39.5	177.75	123.50	34.25	45.63
Fisheries	0.2	11.17	0.4	0.50	12.62	10.95
Innovative schemes/ Specific Projects	198.68	1474.44	572.17	638.55	2707.41	1229.62
Sub Total	974.72	2232.26	1515.37	1661.35	3248.75	1742.92

Table 27. Budget Outlay for SAP during the plan period (2008-09)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Agriculture	1346.88	451.19	208.90	952.80	408.82	428.05
Horticulture	3.50	55.98	2.6	3.0	77.15	20.69
Forestry	1.0	7.35	2.0	1.00	8.52	15.04
Animal Husbandry	609.04	40.70	340.05	352.70	34.25	47.03
Fisheries	0.2	11.17	0.6	561.55	12.62	11.28
Innovative schemes/ Specific Projects	318.97	679.44	879.34		2789.11	1105.78
Sub Total	2279.59	1245.83	1433.49	1871.05	10968.32	1627.87

Table 28. Budget Outlay for SAP during the plan period (2009-10)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Agriculture	1412.97	466.69	1015.65	1071.03	406.75	442.05
Horticulture	3.5	56.09	3.3	3.0	77.52	21.17
Forestry	1.0	7.35	2.0	1.00	8.52	15.40
Animal Husbandry	933.85	41.76	511.85	502.35	34.62	48.13
Fisheries	0.2	11.17	0.8	1.0	12.62	11.55
Innovative schemes/ Specific Projects	199.9	679.44	1007.48	1425.55	3434.96	1198.58
Sub Total	2551.42	1262.5	2541.08	3003.93	3974.99	1736.88

Table 29. Budget Outlay for SAP during the plan period (2010-11)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Agriculture	1463.47	471.19	1095.3	1106.75	407.32	444.55
Horticulture	3.5	56.33	3.7	3.0	77.52	21.70
Forestry	1.0	7.35	2.0	1.00	8.5	15.78
Animal Husbandry	889.17	42.96	685.3	656.15	35.12	49.33
Fisheries	0.2	11.17	1.0	1.00	12.62	11.83
Innovative schemes/ Specific Projects	202.40	679.44	1021.4	684.05	2937.81	1387.06
Sub Total	2559.74	1268.44	2808.7	2451.95	3478.89	1930.25

Table 30. Budget Outlay for SAP during the plan period (2011-12)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad
Agriculture	1519.44	479.69	1172.7	1140.65	408.32	452.8
Horticulture	3.5	57.69	3.9	3.00	78.52	22.29
Forestry	1.0	7.35	2.5	1.50	8.52	16.21
Animal Husbandry	840.04	44.16	867.1	845.00	35.62	50.68
Fisheries	0.2	11.17	1.2	1.0	12.62	12.16
Innovative schemes/ Specific Projects	202.9	679.44	1243.29	518.23	2981.86	1451.46
Sub Total	2567.08	1279.5	3290.69	2509.38	3525.46	2005.6

Table 31. Total Budget Outlay for SAP (Rs. In lacs) Zone-II during the plan period (2007-08 to 2011-12)

Stream	Sirsa	Fatehabad	Hisar	Jind	Rohtak	Faridabad	Total
Agriculture	5988.30	2513.95	4954.1	5166.30	2033.09	2189.5	22845.24
Horticulture	17.50	280.71	15.0	15.00	388.87	105.92	823.0
Forestry	5.0	36.75	10.5	5.50	42.6	77.03	177.38
Animal Husbandry	3797.93	209.10	2582.05	2479.70	173.87	240.08	9482.73
Fisheries	1.0	55.87	4.0	4.00	63.10	57.77	185.74
Innovative schemes/ Specific Projects	1122.85	4192.2	4723.68	3837.93	14972.71	6372.5	35221.87
Grand Total	10932.58	7288.58	12289.33	11508.43	17674.24	9042.8	68735.96

Zone-III

Table 32. Budget Outlay for SAP (Rs. in lacs) during the plan period (2007-08)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Agriculture	1097.6	335.5	436.95	366.8	673.9	352.2
Allied Sectors	1173.83	655.6		241.77		766.85
Horticulture	-	-	91.23	-	269.20	-
Forestry	-	-	-	-	-	-
Animal Husbandry	-	-	808.5	-	206.64	-
Subsidiary occupations/Fisheries	-	-	-	-	36.46	-
Innovative schemes/ Specific Projects	1270.86	1364.62	1184.23	1007.94	294.0	1466.62
Sub Total	3542.29	2355.72	2520.91	1616.51	1480.2	2585.67

Table 33. Budget Outlay (Rs. in Lacs) for SAP during the plan period (2008-09)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Agriculture	1097.6	335.5	436.95	366.8	673.9	352.2
Allied Sectors	851.76	655.6	-	241.77	-	766.85
Horticulture	-	-	94.75	-	269.2	-
Forestry	-	-	-	-	-	-
Animal Husbandry	-	-	808.5	-	206.64	-
Subsidiary occupations/Fisheries	-	-	-	-	36.46	-
Innovative schemes/ Specific Projects	820.08	1268.9	308.23	1007.94	294	1370.9
Sub Total	2769.44	2260.00	1648.43	1616.51	1480.2	2489.95

Table 34. Budget Outlay (Rs. in Lacs) for SAP during the plan period (2009-10)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Agriculture	1097.6	435.5	436.95	366.8	673.9	352.2
Allied Sectors	679.08	655.6	-	241.77	-	766.85
Horticulture	-	-	97.17	-	269.2	-
Forestry	-	-	-	-	-	-
Animal Husbandry	-	-	808.5	-	206.64	-
Subsidiary occupations/Fisheries	-	-	-	-	36.46	-
Innovative schemes/ Specific Projects	820.98	1273.2	308.23	1007.94	294.0	1375.2
Sub Total	2597.66	2364.3	1650.85	1616.51	1480.2	2494.25

Table 35. Budget Outlay (Rs. in Lacs) for SAP during the plan period (2010-11)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Agriculture	1097.6	335.5	436.95	366.8	673.9	352.2
Allied Sectors	706.1	655.6	-	241.77	-	766.25
Horticulture	-	-	100.16	-	269.2	-
Forestry	-	-	-	-	-	-
Animal Husbandry	-	-	808.5	-	206.64	-
Subsidiary occupations/Fisheries	-	-	-	-	36.46	-
Innovative schemes/ Specific Projects	864.0	1277.5	335.23	1007.94	294.0	1379.5
Sub Total	2667.70	2268.6	1680.84	1616.51	1480.2	2498.25

Table 36. Budget Outlay (Rs. In Lacs) for SAP during the plan period (2011-12)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari
Agriculture	1097.6	335.5	436.95	366.8	673.9	352.2
Allied Sectors	734.33	655.6		241.77		766.85
Horticulture	-	-	103.23	-	269.2	-
Forestry	-	-	-	-	-	-
Animal Husbandry	-	-	810.5	-	206.64	-
Subsidiary occupations/Fisheries	-	-	-	-	36.46	-
Innovative schemes/ Specific Projects	864.9	1281.75	389.23	1007.94	294	1383.75
Sub Total	2696.83	2272.85	1739.91	1616.51	1480.20	2502.80

Table 37. Total Budget Outlay of (Rs. in Lacs) Zone-III during the plan period (2007-08 to 2011-12)

Stream	Bhiwani	Gurgaon	Jhajjar	Mewat	Mohindergarh	Rewari	Total
Agriculture	5488.0	1777.5	2184.75	1834.0	3369.5	1761	16314.75
Allied Sectors	3945.01	3278	-	1208.85		3834.25	12266.11
Horticulture	-	-	486.54	-	1346.0	-	1832.54
Forestry	-	-	-	-	-	-	-
Animal Husbandry	-	-	4044.5	-	1033.2	-	5077.7
Subsidiary occupations/Fisheries	-	-	-	-	182.3	-	182.3
Innovative schemes/ Specific Projects	4640.82	6465.97	2525.15	5039.70	1470.0	12571.8	32713.44
Grand Total	14073.83	11521.47	9240.94	8082.55	7401.00	18167.05	68386.84

CHAPTER 10

CONVERGENCE OF NREGA WITH RKVY

(See Annexure I on convergence for reference)

The following priority areas of RKVY were converged with NREGA and other schemes for attaining targeted growth rate of agriculture sector in Haryana State. The estimated cost for the convergence of NREGA and other schemes are described in C-DAP of respective districts.

Sr. No.	Priority Areas	Sr. No.	Priority Areas	Sr. No.	Priority Areas
1	Strengthening of training Infrastructure at KVK	12	Horticulture Seed production	23	Conservation of village pond
2	Strengthening of training Infrastructure at Block Level	13	Conservation of Murrah buffalo	24	Providing community bulls
3	Strengthening of training Labs	14	Supplementing Mineral Mixture	25	Honey processing units
4	Strengthening of Vet. Hospitals	15	Deworming	26	Mushroom units
5	Amelioration of water logged & saline soils	16	Farm & Animal disposal Pits	27	Mushroom processing units
6	Rain water harvesting	17	Vermi-composting	28	Food preservation units
7	Reclamation of Alkali soils	18	Bee Keeping	29	Milk products units
8	Improving soil health through Green Manuring	19	Agro Forestry & Hort.	30	Commercial dairy units
9	Introduction of Summer Moong	20	Laser levelling	31	Development of Panchayat Land
10	Seed production , IPM and INM	21	Mechanisation in Agriculture	32	Improving the efficiency of irrigation through underground pipelines
11	Training, Demonstration, FFS and Group formation	22	Value addition through intercrops	33	Increase in cropping intensity

CHAPTER 11

HOME SCIENCE/WOMEN IN AGRICULTURE

11.1 Introduction

Women constitute little less than half of the population. In rural setting women are instrumental not only in managing the household works but are also actively associated in one way or the other in varying extent for promotion of agriculture crops and performing allied activities. Women also augment family resources through tasks such as collection of fuel, fodder, drinking water and water for family members and domestic animals, kitchen garden, livestock rearing is again responsibilities that farm women share and thus have an important role in providing nutritional security to the family members. Thus women in rural areas besides being farmers' wives are also active agriculture force responsible for production and maintenance of agricultural crops and allied activities. They work as independent producers, agricultural labourers and as home managers. Today 75% of all female workers and 85% of all rural female workers are engaged in agriculture. They constitute 40% of the total agricultural work force in the country. Women are critical to the well-being of farm households. It has been more convenient to label men as farmers and women as home-makers. In fact, women are involved in all aspects of agriculture to seed selection, planting, weeding, pest control, harvesting, crop storage, handling marketing and processing.

Rural women with their multiple roles & responsibilities at farm and household front require technologies to reduce their work stress and improve agricultural productivity, family nutrition and cash flow. The farm women also need technologies to augment the income of the family for a better standard of living. Despite their high involvement in agriculture, women lack adequate knowledge and related aspects. The KVKs are mandated for transfer of technologies in a gender neutral way to the farming community as a whole to farmers and farm women. The activities of KVKs include on farm testing to establish the location specificity of agricultural technologies under various farming situations, frontline demonstration to establish the production potentials on the

farmers' fields as well as feedback mechanism, training of farmers & farm women to update their knowledge and skills in improved agricultural technology and training of extension personnels to orient them in the frontier areas of technology development. It has been experienced the technological needs of farm women with respect to home-making aspects got highlighted and the needs related to their role as farmers are addressed only to the limited extent. High priority should be accorded to recognition and mainstreaming of women's role in agriculture. Appropriate structural, functional and institutional arrangements are proposed to be initiated to empower women and build their capacities and improve their access to inputs such as land credit and agricultural technologies. Certain functional arrangements may be made in the KVKs for higher participation of women farmers in the transfer of technology programmes related to agriculture. The technological needs of farm women which are given adequate attention are also need to broaden their base covering the aspects for ensuring food security, economic security and livelihood security.

The nutritional and health security component need to strengthen the database on the regional and ethnic foods and recipes, analyse their nutritional quality and work towards wider acceptability of appropriate food items among rural households. Development of nutritional guides specific to the regional availability of food items, establishment and maintenance of nutrition gardens could be an important means of ensuring nutritional and health security to the rural families. Under the family resource component introducing women friendly drudgery reducing technologies like pickbag, capron improved sickle, wheel hand hoe, smokeless chulhas etc. for the rural masses and for their health security. Under the clothing and textile component the interventions should be focussed primarily on dress designing, fabric embellishment techniques, diversified uses of durries, functional clothing for farm women and industrial workers. Redesigning of these programmes for members of self-help groups or mobilizing women to form self-help groups and utilizing the skill attained in commercial venture could lead to better utility of these training programmes. It would also ensure economic security. The perception of role of farm women in agriculture and allied activities is undergoing a change in global as well as Indian context. It is being realized that for achieving the food grain production for feeding the ever-growing population, different segments of farming

community need to be equally focused as far as popularizing the improved agriculture technologies is concerned.

10.2 Constraints

- Lack of education and awareness
- Low need for achievement
- Low ability to bear risk
- Overdependence on intermediaries
- Scarcity of raw materials
- Stiff competition
- Low mobility
- Low ability to bear risk
- Low need for achievement
- High cost of production

10.3. SWOT Analysis

Strengths

- Instrumental in managing household works as well as in agril. Crops and promoting allied activities.
- Augment family resources through tasks such as collection of fuel, fodder, drinking water and domestic animals.
- Share the responsibility of kitchen garden, livestock rearing
- Important role in providing nutritional security to family.
- Besides farmers' wives are active agricultural work force
- Also work as independent producers, agril. Partners, agril. Labourers and home-managers.
- 75% all female works and 85% of all rural female works are engaged in agriculture.
- Constitute 40% of the total agril. Work force
- 20% of the rural households are de facto female headed
- Extent of contribution of women in agriculture & related activities is spatial, temporal, socio-economic dimensions affected.

- Role of women in Agricultural & Rural Dev. Is intimately related to the goal of comprehensive socio-economic & political dev.
- At present women workforce in agriculture & allied sectors is estimated at about 61 million which amounts to be about 30% of the total rural workers in the country.
- There are 75 million women against 15 million men in dairying.
- Women engaged in animal husbandry account for 20 million as against 1.5 million men.
- All women irrespective of land status of family provide 14-18 hrs. of productive physical labour in different chores.

Weaknesses

- Inadequate information about the improved technologies
- Inadequate access to agril. Information & innovations
- Excessive workload
- The lack of training opportunities, appropriate information, extension & advisory services available to them.
- Low income
- Drudgery
- Nutritional Insecurity
- Time constraints
- Existing social norms
- Poor diet & inadequate nutrient intake
- Higher requirements not met by conventional diets

Opportunities

- ✓ For the attainment of improved level of production productivity & availability of food, women are as much responsible as men farmers are.
- ✓ Attention in recent years at global level is being given for inclusion of women farmers in the development process as well.
- ✓ The UN Millennium declaration (2000) resolves that to promote gender equality & empowerment of women an effective way to combat poverty, hunger & disease and to stimulate development that is truly sustainable.

- ✓ NAP announced in July 2006 states that high priority should be accorded to recognition & mainstreaming of women role in agriculture.
- ✓ Appropriate structural functional & institutional arrangements are proposed to be initiated to empower women & build their capacities, improve their access to inputs such as land, credit & agril. Technologies.
- ✓ Certain functional arrangements may be made in the KVKs for higher participation of women farmers in the TOT prog. related to agri.
- ✓ The role of SMS (H.Sc.) in KVK need to be broadened from their present role of transferring the technologies related to home & associated activities to their additional role of coordation of activities that facilitates effective transfer of agril. Technologies to the women farmers as well.
- ✓ Modernisation, urbanization and development of education and business and new awareness
- ✓ Movement in transition period.
- ✓ Coordinating agencies and Institutes for Empowerment of Women:
 - ICDS
 - DRDA
 - RUDSET
 - Nehru Yuva Kendra etc.
- ✓ Solar energy available in abundance, sustainable, indigenou, preserves environment & ecology.

Threats

- About 66% female population in rural sector is idle & unutilized.
- Long hrs. of work with much labour resulting to fatigue & drudgery
- Depleting fuel resources
- Devastating exploitation of natural resources
- Increase in population
- Search for alternative sources of energy due to increased consumption & tremendous growth & development.
- Poor nutritional status of children resulting in deficiency diseases
- Malnutrition – resulting into high mortality and morbidity

- Iron deficiency anaemia
- Vit. A deficiency affecting vulnerable sections
- Protein – energy malnutrition.

10.4 The Vision

Strengthening the traditional role of Home Scientist (Need to focus)

- Shift from traditional trainings, viz. tailoring, family nutrition, food preservation, child care to – covering aspects for ensuring food security, economic security and livelihood security.
- Strengthening the data base on the regional & ethnic foods & recipes, analyse their nutritional quality & work towards wider acceptability.
- Development of nutritional guides specific to the regional availability of the food items & their translation in regional language.
- Establishment, maintenance of nutrition gardens for ensuring nutritional & health security of rural family.
- Similarly backyard fruit cultivation, if possible.
- Introducing women friendly technologies.
- Interventions focussed on dyeing procedures, weaving, use of natural and indigenous dyes, economic feasibility of use of locally available agro & animal based fibres, tailoring, knitting, embroidery, embellishment technologies etc.
- Redesigning of these programmes for members of SHGs or
- Mobilising women to form SHGs and utilizing the skill attained in commercial venture.
- Identify and promote need based drudgery reducing testing technologies in agril. & animal husbandry.
- Providing on-going systematic information to beneficiaries
- They are central human units for agril. Production & post harvest mgt. & agro-processing so their participation needs to be ensured.
- Environment building approach
- Increase in knowledge, sharpening of skills, easy and frequent access to women friendly technologies, credit, extension and other support services.

- Need of women entrepreneurship.
- Diets planned & supplemented from cereal based diets to protective foods like pulses, vegetables, fruits, vegetable and milk.
- Supplementing GLV powder in diet to fight against anaemia.
- Use of indigenous GLV in diet.
- Use of paushtik atta for PEM.
- Utilisation of carrot power & use of Vit. A rich food.
- Use of amylase rich foods for infants & children.
- Direct involvement of women who are likely to be affected by dev. Programmes.
- Paradigm shift from awareness to sustainable dev.

Need Gap of Women Farmers

Rural women with their multiple roles & responsibilities require

- Technologies to reduce their work stress and improve agril. Productivity.
- Family Nutritional Security.
- Cash flow
- Need technologies to augment the income the family for a better standard of living.
- Lack of adequate knowledge and technical competency related to technological advances in crop production & related aspects.
- The access to agril. Technology is particularly not neutral in rural setting.
- Informal demarcating/differentiation in the perception of technological needs of women & men farmers.

Redefined Role Towards Agric. Related Programmes

- ✓ Gender analysis of the crops/enterprise (initially) & their relative participation in activities.
- ✓ Abolishing social taboos in interacting & participating in male experts programmes.

- ✓ Create database of the traditional knowledge base owned by rural women folk by proper documentation as they possess vast repository of traditional wisdom & information related to agril. medicinal plants & traditional food factors.
- ✓ Mobilise to form SHGs for economic & social empowerment
- ✓ Backyard fruit & vegetable cultivation.
- ✓ Scientific post-harvest mgt. of farm produce.
- ✓ Field trials on drudgery reducing technologies
- ✓ Have multidisciplinary functions in KVKs. Effective participation in multi-team of KVK.

Priority setting:

- Increase in knowledge, sharpening of skills
- Easy and frequent access to women friendly technologies.
- Credit, extension and other support services.
- OFTs to establish the location specificity of drudgery reducing technologies and other agril. Technologies.
- FLDs to establish its production potentials on the demonstration centres/farmers fields as well as feedback information.
- Training of farm women to update their knowledge & skills to improved agril. Technologies.
- Training of extension personnel to orient them in the frontier areas of technology development.
- Holistic dev. Of agriculture & farm households
- Transfer of technologies in a gender neutral way to the farming community as a whole.
- Direct involvement of women who are likely to be affected by dev. Programmes.

10.5 Sustainability issues and gap analysis of productivity of different allied sectors

Table 38. Sustainability issues and gap analysis of productivity of different allied sectors

(Home Science/Women in Agriculture).

Sr. No.	Gap	Factors/constrains leading to gaps	Strategies	Approach and methodology	Performance indicators	Sustainability output
1.	Women friendly drudgery reducing technologies.	<ul style="list-style-type: none"> Lack of awareness Long hour of work with much labour resulting in fatigue and drudgery 	Educate farm women regarding different technologies related to drudgery reduction like improved sickle, capron, pick bags, maize sheller, wheel hand hoe, dung collector trolley etc.	<ul style="list-style-type: none"> Training and demonstrations to educate farm women. On Farm Trials (OFT) 	Entire state	<ul style="list-style-type: none"> *Reduction in drudgery and physiological stress. *Increased efficiency.
2.	Fuel efficient chullah	Depleting fuel resources	Aware farm women regarding health hazards caused by traditional chullahs and need of conservation of resources.	<ul style="list-style-type: none"> Demonstration 	Entire state	* Improvement in the health status and less consumption of fuel.
3.	Solar energy for rural development	Devastating exploitation of natural resources and increase in population	Search for alternative sources of energy due to increased consumption and tremendous growth and development viz. solar cooker, solar drier, solar lantern etc.	Training and Demonstration	Entire state	*Provides clean energy and preserves the environment and ecology and conserves fuel resources.
4.	Bio-gas plants	<ul style="list-style-type: none"> * Narrow nozzle pipe for putting dung * Lack of awareness. 	Exposure visit of farm women to model bio-gas plant units and their motivation regarding importance of biogas plants and conservation of human resources.	Training and demonstrations on installation of biogas plants and their linkage with the line departments.	Entire state	Improvement in the health status and economic status of farm-women. Eco-friendly technology.
5.	Safe drinking water	<ul style="list-style-type: none"> Lack of Awareness and technical knowhow. Lack of resources. 	* Educate farm women regarding water-borne diseases	Demonstration on different ways of purifying drinking water viz. boiling, solar disinfection, cloth filter, chemical disinfection,	Entire state	Improvement in health status.

				Matka filter and use of indigenous plants like Sahjana seeds		
6.	Nutrition gardens	<ul style="list-style-type: none"> • Scarcity of water • Lack of achievement • Scarcity of land 	Educating farm women regarding importance of nutritious and fresh vegetables and fruits grown in nutrition gardens	* Kitchen gardening, seed packets/seedlings/fruit plants	Entire state	Improvement in nutritional status and nutritional security and economic security.
7.	Clean milk production	<ul style="list-style-type: none"> • Scarcity of water and space • Excessive workload 	Educating farm women about importance of clean milk production and related aspects viz. clean environment and premises, clean vessels, milk containers, clean animals, clean milking and clean milk storage.	Training and Demonstrations	Entire state	* Prevention of illness and poor health.
8.	Designing and stitching	<ul style="list-style-type: none"> • Low mobility • Stiff competition • Low need of achievement 	Educating farm women on dress designing and making the linkages with markets and schools.	Training through paper patterns, drafting and adaptation	Entire state	Increase in economic status and self-confidence.
9.	Complementary feeding	<ul style="list-style-type: none"> • Ignorance • Wrong traditional beliefs regarding feeding practices. • Inadequate amounts. 	Involvement of farm women, Anganwadi workers and field functionaries in production, distribution and consumption of instant complementary foods based on locally available low cost nutrition foodstuffs.	Trainings and Demonstrations	Entire state	Improvement in health and nutritional status.
10.	Malnutrition and nutritional deficiency diseases	<ul style="list-style-type: none"> • Ignorance • Prejudices and superstitions • Poor hygienic environmental conditions • Socio-economic causes 	<ul style="list-style-type: none"> • Educating farm women, pregnant and lactating mothers and adolescent girls about causes and prevention of malnutrition, iron and vit. A deficiency diseases. • To promote dietary intake of proteins, vitamin A and iron rich foods for alleviating the problem of malnutrition and deficiency diseases in all age groups. 	Training and demonstration on value added products of protein, vitamin A, vitamin C and iron rich foods viz. green leafy vegetables, papaya, pumpkin, carrots, soybean, Til, groundnut etc.	Entire state	Improvement in the health and nutritional status of children, pregnant lactating mothers and adolescent girls.

10.6 Finance required for Special Projects of Home Science Activities (one time investment)

(a) Non-recurring Expenditure

(i) Strengthening of training infrastructure facilities at all Krishi Vigyan Kendras

Table 39. Cost for infrastructure for one KVK

Sr. No.	Infrastructure	No.	Cost (in Lacs) for 1 KVK	Cost (in Lacs) for 19 KVKs
1.	Establishment of Home Science Lab.	1 (each KVK)	Rs. 9.95 Lacs (one time)	9.95x 19 = 189.05 Lacs

See Table 67 for equipments list

(b) Recurring Expenditure

(Per year)

- 1. Mahila Helper for Lab.** (On contractual basis) 25 days
employment/material @ D.C. rate

$$\begin{array}{r} \underline{D} \quad \underline{X} \quad \underline{R} \quad \quad \underline{M} \quad \quad \underline{Y} \quad \quad \underline{\text{Whole Stat}} \\ 25 \quad \times \quad 150 \quad = \quad 3750 \quad \times \quad 12 \quad = \quad 45,000 \quad \times \quad 19 \quad = \quad 8,55,000.00 \end{array}$$

Training Materials:

<u>2007-08</u>	<u>2008-09</u>	<u>2009-10</u>	<u>2010-11</u>	<u>2011-12</u>
24,000	24,000	24,000	24,000	24,000
24000 X 19 = 4.56 Lacs				

Table 40. Farm Women Field Schools covering identified critical technologies in next five years (One KVK)

Fields	2007-08		2008-09		2009-10		2010-11		2011-12		Total		For all 19 KVKs	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
Home Science/Women in Agriculture (20 women)	1	.40	1	.40	1	.40	1	.40	1	.40	5	2.0	95	7.60 Lacs

Cost - 0.40 Lacs/FFS

Table 41. Closing the gap for realizing the vision (Women in Agriculture)

Issues	Programmes	Activities	Collaborators/Targets
Drudgery Reducing Technologies	Conducting trainings, demonstrations, OFTs and FLDs in selected villages	Putting Exhibits at Farm women Field Schools (Progressive farm women)	ICDS FFS Mahila Mandal
Conservation of resources	Fuel efficient bulbs Solar equipments Vermi-composting Biogas plants	Putting actual models Besides training & demonstration	BDO ADO DRDA ICDS FRM (COHS, CCS HAU, Hisar)
Environmental sanitation	Soakage Pit	Construction of soakage pit. Training & demonstration	FRM (COHS, CCS HAU, Hisar)
Safe Drinking water	Different water Purification Techniques at household levels	Demonstration on different techniques	ICDS
Nutritional security	Kitchen gardening/Pot gardening	Training on scientific method of nutrition gardening	ICDS DHO
Malnutrition & deficiency diseases	Nutrition Education value Added Products of Til, Soybean, Bajra, Groundnuts, Carrot, Green leafy vegetables etc.	Training & Demonstration	ICDS
Economic empowerment of farm women	Training course on dress designing and tailoring, detergent making, fabric embellishment techniques etc.	Trainings & demonstrations	DRDA Red Cross RVDSET NEHRU YUVA KENDRA

Table 42. Training Proposed for Capacity Building of Farm Women at District Level

Sr. No.	Subject	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Women Friendly Drudgery Reducing Techniques	200	.80	200	.80	200	.80	200	.80	200	.80	1000	4.0
2.	Fuel efficient chullahs	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
3.	Solar energy for rural development	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
4.	Biogas plants	20	.08	20	.08	20	.08	20	.08	20	.08	100	.4
5.	vermi-composting	50	.20	50	.20	50	.20	50	.20	50	.20	250	1.0
6.	Safe Drinking water	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
7.	Nutrition gardens	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
8.	Dress Designing & Stitching	20	.08	20	.08	20	.08	20	.08	20	.08	100	.4
9.	Complementary feeding	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
10.	Malnutrition & nutritional	100	.40	100	.40	100	.40	100	.40	100	.40	500	2.0
Total											17.8 x19		338.2 Lacs

Table 43. Training Proposed for Capacity Building of Women field functionaries (At District Level)

Name of Department	2007-08		2008-09		2009-10		2010-11		2011-12		Total		For all KVKs	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
ICDS/DRDA, Nehru Yuva Kendra	200	1.2	200	1.2	200	1.2	200	1.2	200	1.2	1000	6.0	21,000	72.0
NGOs	25	1.5	25	1.5	25	1.5	25	1.5	25	1.5	125	.75	2,625	9.45
Total	225	1.35	225	1.35	225	1.35	225	1.35	225	1.35	1225	6.75	23,625	81.45

Year-wise No. of training/man days

Phy- No., Fin- Rs. in Lacs

Table 44. Trainings Proposed for capacity building of field functionaries (at State Level)

Name of Department	2007-08		2008-09		2009-10		2010-11		2011-12		Total		For all KVKs	
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
ICDS/DRDA, Nehru Yuva Kendra	100	.6	100	.6	100	.6	100	.6	100	.6	500	3.0	10,500	63.0

Cost norms - Rs.600/trainee/day

Table 45. Proposed Study Tour/Exposure visits of Extension Workers

Subject	2007-08		2008-09		2009-10		2010-11		2011-12		Total		For all 19 KVKs		
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	
Inter State exposure visit for a batch of 5 extension workers in the district @ Rs.500/day/extension worker for 10 days maximum excluding travelling expenses	8	.25	8	.25	8	.25	8	.25	8	.25	40	1.25	760	23.75	
International exposure visit of 1 extension worker in the district @Rs.5000/day/extension worker for 15 days at least excluding traveling exposure.	1	.75	1	.75	1	.75	1	.75	1	.75	5	3.75	95	356.25	
Total														380	Lacs

Table 46. Proposed Study Tour/Exposure visit of Farm Women

Sr. No.	Activity/Component	2007-08		2008-09		2009-10		2010-11		2011-12		Total		For all 19 KVKs'	
1.	Inter district exposure visit of farm women for a batch 20 @ Rs.300/per head per day for two days.	2	2.4	2	2.4	2	2.4	2	2.4	2	2.4	10	12	190	228
2.	Inter State Exposure visit for a batch of 10 farm women @ Rs.300/day excluding travel expenses (per head per day) for maximum 10 days including journey period.	1	.30	1	.30	1	.30	1	.30	1	.30	5	1.5	95	1805
Total														2033	Lacs

Table 47. List of equipments and machinery for setting up Home Sci. Lab. at each KVK.

Sr. No.	Name of the Equipments	Approx. Cost (Rs.)
Foods & Nutrition & Food Science & Technology		
1.	Gas connection with gas burner having 3 cylinders (commercial connection) <ul style="list-style-type: none"> • Gas burner with 4 pots • Gas burner with 1 pot • Gas burner with 2 pots 	30000-00
2.	(a) Weighing balance (1 kg. capacity, 5 kg. capacity & 10 kg. capacity). (b) Electronic balance	5000-00 5000-00
3.	Food Processor (2 sets) (Mixer, grinder, juicer etc.)	10000-00
4.	Hand operated (2 sets) (Mixer, Juicer)	5000-00
5.	Electronic Microwave oven Egg beaters (Electric & Manual) Cake tins Trays etc.	100000-00 25000-00 2000-00 2000-00
6.	Knives, graters, peelers, cutters, churner and home accessories, strainers etc.	25000-00
7.	Cooking utensils (Pressure cookers, Patilas with lids, containers, kadahies and other utensils)	25000-00
8.	Boiling machine (Crown corking machine)	5000-00
9.	Pulping machine (Mini)	15000-00
10.	Sealing machine	5000-00
11.	Chips making machine	20000-00
12.	Electronic drier (Air oven)	50000-00
13.	Refrigerator (Big)	30000-00
14.	Aquaguard/RO	20000-00
15.	Desert coolers	10000-00
16.	A.C.(2 each 1.5 ton)	60000-00
17.	Storage racks (2 sets)	10000-00
18.	Demonstration table	10000-00
19.	Homogenizer	50000-00
20.	Juice Extracting Machine	25000-00
21.	C.P.Capsealer Electric	20000-00
22.	C.P.Capsealer Manual	2500-00

	Sub Total	589000-00
Clothing & Textile		
Dress designing		
1.	10 sewing machines with foot	30000-00
2.	Interlock machine	5000-00
3.	Accessories(Threads, needle box, scissors, inch tape etc.)	2000-00
4.	Cutting table with flannel (2 Nos.)	40000-00
5.	Utensils for dyeing	1000-00
6.	Blocks, stencils	1000-00
7.	Storage cabinet (1 No.)	5000-00
8.	Storage racks (1 No.)	2000-00
9.	Miscellaneous	14000-00
	Sub Total	100000-00
Human Development & Family Studies		
1.	Weighing machine, Height rods Infantometer	15000-00
2.	Teaching materials	10000-00
3.	Display boards	20000-00
4.	Stencils	5000-00
5.	Storage almirah and racks	10000-00
6.	Educational toys	10000-00
	Sub Total	70000-00
Family Resource Management		
1.	Fuel efficient pipeless chullahs	250-00
2.	Solar lantern	4000-00
3.	Solar drier	4000-00
4.	Solar Lighting system	12000-00
5.	Bio-gas unit	10000-00
6.	Drudgery reducing devices (Trolley, wheel hand hoe, capron, fodder collector, gloves)	5500-00
7.	Drudgery reducing kitchen appliances (Grater, peeler, knives, sag cutter, potato masher)	1000-00
8.	Miscellaneous	13250-00
	Sub Total	50000-00
Extension Education		
1.	Infrared thermometer	1500-00
2.	Hot Plate (for melting wax)	1000-00
3.	Paraffin wax	1000-00
4.	Gel Wax	1000-00
5.	Glass containers (tumblers)	1000-00
6.	Candle moulds (straight)	5000-00
7.	Designer moulds	5000-00
8.	Accessories (wick, colour, fragrance, additives, stone marbles, Adhesives & threads)	5000-00
9.	Miscellaneous	4000-00
10.	Wax boiler/melter (double boiler)	1000-00
11.	Pouring pitcher	1000-00
12.	Storage cabin	5000-00
13.	C.D.Library	10000-00
14.	Mixer for detergent making	10000-00
15.	Laptop	50000-00
16.	Digital camera	25000-00
17.	Miscellaneous (Furniture & Fans)	10000-00
	Sub Total:	150000-00
	Grand Total	9,59,000

Table 48. Total Budget Outlay for Home Science Activities for the plan period

Sr. No.	Particulars	Amount (Rs. in Lacs)
1	Non-recurring Expenditure	189.05
2	Recurring Expenditure	8.55
3	Training Materials	4.56
4	Farm Women Field Schools	7.60
5	Training Proposed for Capacity Building of Farm Women at District Level	81.45
6	Training Proposed for Capacity Building of Women field functionaries (At District Level)	63.00
7	Proposed Study Tour/Exposure visits of Extension Workers	380.00
8	Proposed Study Tour/Exposure visit of Farm Women	2033.00
Total		2767.21

CHAPTER 12

CONCLUDING REMARKS

In order to improve the livelihood of rural households, there is need to enhance the farm income in a holistic manner. Enhanced productivity can be achieved by adoption of improved environment friendly technologies in a sustainable manner linked with good market potential. The present State Agriculture Plan (SAP) has been prepared keeping in view the current and future aspects concerning livelihood security of farming community of the State with the following remarks.

1. The evolution of green revolution varieties and their management, creation of favorable infrastructure of irrigation, fertilizer industry and assured marketing coupled with minimum support price policy augmented the area as well as productivity of crops. During the last few years the growth in cereal production (rice and wheat) has been due to agronomic management and free market economy by giving good prices of agricultural produce to its farmers. The continuous dominance of rice-wheat cropping system in Zone-I and II has depleted underground water resources and resulted in nutrient mining. The recent debate on falling water table and deteriorating soil health has prompted the scientists to rethink. The extension functionaries and scientists are now advising the farmers to adopt conservation agriculture, judicious use of irrigation water, balance use of fertilizers and need based pesticides. India and perhaps the whole world are short of rice and wheat which are best grown in Zone-I and II. We, therefore, can not reduce the area of rice and wheat under diversification that does not guarantee supplies to growing population of our country. The scientists and even farmers have favored diversification within rice-wheat cropping system with technologies that are less costly and allow savings in the natural resources. Thus, the slogan of diversification may have flown without any tangible outcome. The efforts need to be concentrated on producing more cereals per unit area because the scope of area expansion under crops is squeezing due to urbanization. There is need of strong linkages and synergies with the public and private

sectors for hybrids/varieties to improve productivity using less resource.

2. The current need is 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 increase their income and remain engaged at the same time. The goal of the plan is to increase productivity at 4% per year, reduce water consumption by 10% in rice- wheat cropping system and reduce energy consumption by 10% in agriculture. Further, the reduction in energy consumption upto 50% need to be targeted through reduced fuel consumption at crop establishment at least. Savings in energy consumption is expected to reduce the associated carbon dioxide emissions. The price of already subsidized diesel will may rise further in future. Resource conservation technologies like zero-tillage for conservation agriculture are available that can reduce the energy consumption and increase profits. Laser land leveling and bed planting can save the scarce underground water resource. Green manuring and inclusion of summer moong in rice-wheat crop rotation in fallow period will improve the soil health and decrease the input pressure of all kinds. In future, the decreasing size of operational holding in the State will demand the use of these technologies to increase resource use efficiency.

3. The farmers of the State have become important competitors in all sorts of agriculture produce, from cereal to milk, mushroom, honey, vegetables and fisheries. The State is well known for basmati rice. The success of the economic transformation can be measured by the falling share of agriculture in the gross domestic product which has decreased to almost 22%. Agriculture is likely to provide less jobs now compared with over two-thirds only ten years ago. Even so, over 65% of population still lives in villages, so a successful rural economy will remain the key to maintaining its impressive progress. Knowledge and skill 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 the district where its young population does not wish to adopt farming as a profession. The urbanization is happening in the State 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 of the important ingredients of success. It is sure that the different sources of income including crops, dairying, mushroom cultivation, fisheries and honeybee production etc can help farmers to get daily income. Integration and balancing crop cultures and subsidiary occupations is the focus of this plan to boost the income and living standard of the farming community.

4. The demand for labour in the State is increasing particularly for rice transplanting, harvesting and other agriculture operations including grading and processing of grains, vegetables and fruits. On the contrary the availability of local labour is decreasing. This will demand more mechanization for sowing, harvesting, storage and processing. The increased targets of XI five year plan could be met only by the adoption of efficient higher technology levels in all cropping systems especially in rice-wheat cropping system. This would require large scale availability of machinery for land leveling (laser land leveler), tillage (especially zero tillage machines, bed planter and paddy transplanters) in the State. 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 the State must be done for planning for the next season. This exercise may be made mandatory and should form part of planning process for any current year. Time has now come to again review commendation of fertilizers and to meet the target of attainable yield of 10 per cent farmers; the recommendations of fertilizers may have to increase from the current level to harvest maximum productivity levels.

5. As the information technology has become accessible, easy and affordable, extension services and/or can be out sourced from any where. It can be seen in spread of hybrids of rice and vegetables. More and more linkages synergies need to be developed by outsourcing technologies. More and more infrastructure facilities need to be put to use with DDA's, DHOs, Animal Husbandry officers, Fisheries Officers etc. which then can be linked to KVKs for a perfect integration of agriculture. Data center need to be created to increase the computing capacity of extension workers. The data center for state may be located at main campus of CCS HAU, Hisar.

Proposed Budget for XIth Plan
Haryana State
(Stream-I: Specific Projects & Stream-II:
Strengthening of Existing State Sector Activities)

Sr. No.	Sector/Scheme	Proposed Outlay (Rs. in Lacs)
1	Agriculture	91777.24
2	Allied Sectors	52543.53
3	Specific projects for Convergence of NREGA & Other Schemes with RKVY	82186.59
3	Women in Agriculture	2767.21
Total		229274.57

ANNEXURE I

WITH REFERENCE TO CONVERGENCE (SONIPAT DISTRICT)

CONVERGENCE OF "RASTRIYA KRISHI VIKAS YOJNA" WITH OTHER RURAL SCHEMES

Rastriya Krishi Vikas Yojna (RKVY) has been designated for incentivizing the states so as to increase their investments in the agriculture and allied sectors for achieving the growth rate of 4% annually during 11th five years plan period. Emphasis has been laid on the convergence in planning, management and implementation in agriculture development for making optimum use of resources in the context of quantum jump in the outlays in agriculture and allied sectors, water resources and rural development through RKVY. National Food Security Mission (NFSM), NRM, NREGS, Bharat Nirman and Backward Region Grant Fund (BRGF) etc. The objective of convergence is to utilize the available resources at the optimum level and to capitalize the assets created under one scheme by taking it to the next higher level. The assets created and capacity built under one scheme can be further fortified by taking up the next economic activity which can boost growth of agriculture and allied sector.

A. **Convergence of Agriculture Component under RKVY with NREGA:**

1. **Rain water harvesting:**

Water harvesting refers to collection and storage of rain water, prevention of losses through evaporation and seepage and all other hydrological and engineering interventions, aimed at conservation and efficient utilization of rain water. Rain is the primary source of water for us. Rivers, lakes and ground water are the secondary sources of water on which we depend a lot for irrigation. Water harvesting means to understand the value of rain and make optimum use of it at the place where it falls.

Annual rainfall of the district is nearly 550 mm, but this rainfall occurs during drought spell with high intensity resulting in rapid surface flow, leaving very little for the recharge of ground water.

Existing ground water situation of Sonipat district:

Net ground water availability (Ha.m)	Existing ground water draft for irrigation (Ha.m)	Ground water availability for further irrigation development (Ha.m)	Category
44956	48178	-3534	Over exploited

Water harvesting structures to be constructed during the coming three years:

Year	No. of structures to be constructed	Dimension	Project cost / structure (Rs.)	Labor cost /structure (Rs.)
2009-10	50	5'×5'×7'	110000.00	35000.00
2010-11	50	5'×5'×7'	110000.00	35000.00
2011-12	50	5'×5'×7'	110000.00	35000.00

Note: The expenditure of labor component would be met under NREGS/other schemes.

1. Construction of Panchayati Pucca Rasta:

Farmers face difficulty in carrying out agricultural activities in their fields due to undulating Panchayati Kuccha Rasta. These should be leveled and made Pucca Rasta with the help of labors under NREGS and Haryali (IWDP) Scheme.

Year	Length of Rasta (KM)	Anti. Cost (Rs.)			Remarks
		Earth filling	Labor	Total	
2009-10	2	485000.00	268000.00	753000.00	Labor cost be met under NREGS
2010-11	2	485000.00	268000.00	753000.00	
2011-12	2	485000.00	268000.00	753000.00	

2. Plantation:

Year	No. of plants	Plant cost (Rs.)	Labor Cost/ plant (Rs.)	Watering cost (Rs.)	Total cost (Rs.)	Remarks.
2009-10	10000	60000.00	59000.00	250000.00	379000.00	Labor cost be met under NREGS.
2010-11	10000	60000.00	59000.00	250000.00	379000.00	
2011-12	10000	60000.00	59000.00	250000.00	379000.00	

B. Convergence of Horticulture Component under RKVY with NREGA:

1. Construction of community tanks:

Year	No. of tanks	Tank Dimension	Man days	Total cost (Rs.)	Remarks
2009-10	2	220'×198'×15'	18670	2576460.00	Labor cost be met under NREGS
2010-11	2	220'×198'×15'	18670	2576460.00	
2011-12	2	220'×198'×15'	18670	2576460.00	

2. Grass Hopper control in Institutional areas:

Grass hopper is causing a menace during the rainy season. It attacks fodder crops and sugarcane severely. It lays its eggs in road sides and unculturable fellow land. These fellow lands have to be dusted / sprayed to control the grass hopper. The following are the estimates to control in institutional fellow areas.

Area in Hact.	Comparative statement of recommended pesticides wise budget requirement for institutional areas.										Labor charges @ Rs. 138/-	
	Melathion 50 EC		Carbaryl 50 WP		Methyl Parathion		2% Dust		Fenvelerate 2% Dust		Man days	Rs.
	Ltrs.	Cost Rs.	Ltrs.	Cost Rs.	Kgs.	Cost Rs.	Kgs.	Cost Rs.	Kgs.	Cost Rs.		
3924	4905	931950.00	7358	3679000.00	98100	981000.00	98100	981000.00	98100	981000.00	1984	271032.00
Doses / Man days	0.50 Lt. / acre or 1.250 Lt. / Ha		0.750 Kg. / acre or 1.875 Kg. / Ha.		10 Kg. / acre or 25 Kg. / Ha.		10 Kg. / acre or 25 Kg. / Ha.		10 Kg. / acre or 25 Kg. / Ha.		5 Acre = 2 1 Ha. = 1	
Rate / Lt / kg / & Wages	190/-		500/-		10/-		10/-		10/-		As per NREGS norms	

B. Convergence of Fisheries Component under RKVY with NREGA:

1. To construct new ponds and renovate existing ponds

The activity under convergence of Fisheries Component under RKVY with NREGA is to construct new ponds and renovate existing ponds in different panchayat and supplement these ponds with fingerlings and other inputs or fish culture. There will be increase in fish productivity and income from ponds to the panchayats as well as employment opportunities under NREGS as it is a labor intensive activity.

Year	Activity		Total outlay (Rs.)		Labor component		Remarks
	Construction of new ponds in ha.	Renovation in ha.	New ponds	Renovation @ Rs. 75000/- per ha.	New ponds	Renovation	
2009-10	10	40	3000000.00	300000.00	50%	50%	50% of cost under SGRY
2010-11	10	40	3000000.00	300000.00	50%	50%	
2001-12	10	40	3000000.00	300000.00	50%	50%	

