



Department of Agriculture
Himachal Pradesh

DISTRICT AGRICULTURE PLAN

HAMIRPUR, HIMACHAL PRADESH

Volume - III



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District Agriculture Plans of Himachal Pradesh

- 1. Bilaspur**
- 2. Chamba**
- 3. Hamirpur**
- 4. Kangra**
- 5. Kinnaur**
- 6. Kullu**
- 7. Lahaul-Spiti**
- 8. Mandi**
- 9. Shimla**
- 10. Sirmaur**
- 11. Solan**

FOREWORD

Reducing hunger and poverty in the country by half by 2015, the first UN millennium development goal, remains a serious concern. The small and marginal farmers constituting 65 per cent of the producers in India face hunger and poverty. Food insecurity among them is both a cause and consequence of poverty. Farmers are also consumers and 70 per cent of the consumers in India are also those who earn their livelihood in farming. Because of continuing poor performance of agriculture in rainfed areas and by these farmers, the growth rates of Indian agriculture witnessed sharp deceleration during the last decade, plummeting to less than 2 per cent for the decade 1995-2005 and then rising slightly above two per cent during 2006-07. However, it is still much less than the expected growth rate of 4 per cent. The Eleventh Five Year Plan (2007-2012) has set a target of 4 per cent for agricultural sector against 9 per cent for the economy as a whole. Therefore, how the nation and states jointly prepare the farmers to learn to live under the new challenges and opportunities will largely determine the success in managing the national food security and poverty scenario.

The uncommon opportunities for launching a new initiative named evergreen revolution, especially to address agricultural concerns of small farmers in rainfed areas, demand innovative policies and strategies, new planning and frontier technologies which can enhance productivity per unit of land and water. For this purpose, the most important strategic programme introduced in the Eleventh Five Year Plan is Rashtriya Krishi Vikas Yojna (RKVY) with an outlay of Rs. 25,000 crores. It gives states more flexibility and incentives to spend more on agricultural sector. The additional assistance is given to the state governments, provided expenditure on agriculture by the state governments is higher than the base period, which is defined as the moving average of the expenditure of the preceding three years. The success of efforts of states in the coming five years will depend on the scale of success of synergies it is able to develop with RKVY and other programmes.

To avail additional assistance under this scheme, a framework has been provided which requires that every district should draw up a district agriculture plan that fully utilises an initial resource envelope from all existing schemes, state or central, including resources at the district level from central schemes such as those of Ministry of Rural Development, Ministry of Panchayati Raj and other Ministries. *“The DISTRICT AGRICULTURE PLANS (DAPs) are aimed at determining the overall resource envelope of each district, its production plan and the associated input plan”*. The DAPs will document the diversity of farming economy and growth patterns within the district, potential micro climatic niches, farming systems and natural resources, cropping patterns and livestock. It has also been emphasised to integrate these district level agricultural plans with the state plan. It has been made mandatory to prepare DAPs in accordance with the guidelines issued by the Planning Commission, so as to benefit from the new central schemes for agricultural development.

It is in this context that the Department of Agriculture, Govt of Himachal Pradesh, entrusted the task of preparing the District Agriculture Plans (DAPs) of eleven districts except Una and State Agriculture Plan (SAP) to the H.P. Agricultural University, Palampur. The university took this gigantic task seriously and constituted a core team of agricultural economists under the leadership of Dr. H. R. Sharma, Professor and Head Department of Agricultural Economics, Extension Education & Rural Sociology. The team developed conceptual framework and evolved methodology for the selection of sample panchayats. Overall, 367 sample panchayats were selected from all the 72 blocks of eleven districts in the state. Two questionnaires, one to collect data at the block level and other to collect data at the panchayat level, were prepared. To accomplish the task of data collection, over 200 scientists of the university were engaged for conducting field survey and secondary data collection from across the state in as many as 72 teams. The scientists remained in the field for about two weeks and collected data from the selected panchayats and blocks using participatory rural appraisal (PRA). To ensure comprehensiveness

in data collection for these plans, each district was assigned to a team(s) of agricultural economists. The agricultural economists incharge of different districts worked to prepare draft agriculture plans for different districts, including state agriculture plan.

The field data were further compiled and analysed by the core team of agricultural economists. The plans have been prepared as per the guidelines laid down by the Planning Commission in Comprehensive District Agriculture Plan Manual (C-DAP). Each DAP document contains a plethora of information on various aspects of agricultural development such as cropping patterns, cropping systems, input use, yield gaps, diseases, constraints and required R&D interventions, projected rates of growth for major agricultural crops and agricultural sector including horticulture and animal husbandry and projected input requirements. DAP documents also contain estimates on rural roads, available irrigation potential including water harvesting, soil conservation, human resource requirement and researchable issues that require attention to boost agricultural production and productivity of agricultural sector.

In accomplishing this task, a large team of scientists, administrative staff of the university and key persons of the state Government played key roles. The team leader, Dr. H. R. Sharma and his core team comprising Dr. S. K. Chauhan, Dr. K. D. Sharma, Dr. Virender Kumar and Dr. Harbans Lal prepared the broad framework for preparing the plans. Dr. Kamlesh Singh, Professor Statistics, Mr. Vaibhav Kalia and Mr. Kapil Sharma computer programmers developed a computer programme to analyse the data. The District Agriculture Plan for Hamirpur was prepared by Dr. Rajesh Kumar Thakur, Scientist Incharge KVK, Hamirpur, at Bara. In addition, a large number of scientists and administrative staff of the university were involved in the first ever such state wide field survey for weeks. I wish to place on record my appreciation of the wonderful work done by each one of the above named persons and those I could not mention by name.

Throughout the work on DAPs, the university team received valuable backup advisory support from several officers of the Department of Agriculture, Horticulture and Animal Husbandry in particular from Mr. J. C. Rana, Director, Agriculture, Mr. H. R. Sharma, Additional Director, Agriculture and Mr. Y. P. Thakur, Superintendent Engineer (Soil Conservation) and on behalf of the university I wish to thank them. Lastly, I appreciate and acknowledge the cooperation and help so willingly offered to survey teams and economist incharges by the district level officers of different departments, especially those from the agriculture department, the scientists of UHF, Solan and the Pradhans of Panchayats as well as farmers, during the field surveys and report preparation.



DR TEJ PARTAP
Vice Chancellor

Palampur, March 18, 2009

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Executive Summary of the Plan

The proposed plan has been designed to generate more than 4 per cent annual growth rate in agriculture sector. The funding proposal for the next five year plan has been extracted from the comprehensive district agriculture plan. The comprehensive district agriculture plan along with sector-wise plan outlay and its distribution for the next five years have been presented in the Table below. In the comprehensive plan, total outlay would be Rs 410.16 crores out of which about 10.19 per cent has been earmarked for addressing the crop related issues like promotion of seeds of high yielding varieties, improvement of soil health, protection of crops against biotic and abiotic stresses, promoting water use efficiency, etc. Among different components of interventions to improve and enhance sustainability of crop production system, highest budget has been earmarked for protected cultivation (Rs.1478 lakhs) followed by improvement of crop productivity (Rs 650 lakhs) and improving the water use efficiency through micro-irrigation (Rs 1200 lakhs). The table reveals that in present plan highest priority has been given for natural resource management and infrastructural development. During the survey, while having interaction with the farmers and district level planners, it was pointed out that irrigation, marketing infra-structure, rural road connectivity, irrigation, soil and water conservation are key grass root level factors which promote the growth of agriculture. Hence, a sizable chunk of funds has been kept for development of irrigation and water harvesting through check dams, ponds and tanks, which will increase the irrigation potential in the district and there will be diversification in the farming system towards commercial activities and enterprises. The varietal, technological and managerial gaps are the major constraints responsible for the low yields of different fruit crops. These issues need to be addressed by different technological and extension interventions for which an outlay of Rs 90 lakhs has been kept. This will boost the efficiency of huge investment which is being made under the Horticulture Technology Mission in the horticulture sector. Similarly, the plan outlay to the tune of Rs 837 lakhs has been proposed to address the issues of the livestock, poultry and fishery component in the district. Over the five years period, the plan outlay has been allocated in the proportion of 15 per cent for the first year of the plan, 20 per cent each for the next three years and the remaining 25 per cent is proposed to be spent in the fifth year of the plan.

I. District Agricultural Plan: Funding Proposal for Five Years (Lakh Rs.)

Sr. No.	Schemes	Total Plan	Yearly Allocation				
		Outlay	I	II	III	IV	V
I	Interventions to Improve and Enhance Sustainability of Crop Production System	4178	626.7	835.6	835.6	835.6	1044.5
1	Improvement of productivity of cereals, pulses, oilseeds, vegetables and spices crops through promotion of HYV seeds including hybrids	650	97.5	130	130	130	162.5
2	Improvement of soil health through vermi-composting, bio-fertilizers, micro nutrients, soil testing etc.	375	56.25	75	75	75	93.75
3	Protection of crops against biotic stresses (diseases, pests, weeds) and abiotic stresses (hail storms, drought, flash floods, etc.) and other risk factors	100	15	20	20	20	25
4	Water use efficiency through micro irrigation	1200	180	240	240	240	300
	(i) Sprinkler	1100	165	220	220	220	275
	(ii) Drip	100					
5	Agricultural mechanization through popularization of improved tools and hill specific machinery like power tillers, tractors, crop planters/ harvesters, sprayers, clod breakers and gender friendly post-harvesting equipments to remove women drudgery	350	52.5	70	70	70	87.5
6	Protected (poly house) cultivation to minimize risk factors and enhance quality and productivity	1478	221.7	295.6	295.6	295.6	369.5
7	Strengthening and improvement of quality control infrastructure (seed, pesticides and fertilizer testing laboratories)	15	2.25	3	3	3	3.75
8	Strengthening of seed production farms and promotion of infrastructure to improve seed production and replacement	10	1.5	2	2	2	2.5
II	Need Based Infrastructure Development	934	140.1	186.8	186.8	186.8	233.5
1	Improvement of on-farm water delivery and efficiency of existing irrigation systems	586	87.9	117.2	117.2	117.2	146.5
2	Rural markets	348	52.2	69.6	69.6	69.6	87
III	Natural Resource Conservation and Management	13241	1986.15	2648.2	2648.2	2648.2	3310.25
1.	Soil conservation of arable and non-arable land through engineering measures	909	136.35	181.8	181.8	181.8	227.25
2.	Water harvesting check dams, ponds, tanks, etc.	11050	1657.5	2210	2210	2210	2762.5
3.	Land improvement	1282	192.3	256.4	256.4	256.4	320.5

IV	Niche Based Enterprises for Rural Entrepreneurs	1248	187.2	249.6	249.6	249.6	312
	(i) Organic farming	140	21	28	28	28	35
	(iii) Mushroom	768	115.2	153.6	153.6	153.6	192
	(iv) Sericulture	11	1.65	2.2	2.2	2.2	2.75
	(v) Agro-tourism	315	47.25	63	63	63	78.75
	(vi) Medicinal and aromatic plants	14	2.1	2.8	2.8	2.8	3.5
V	Fruit Production	90	13.5	18	18	18	22.5
VI	Livestock, Poultry & Fisheries	837	125.55	167.4	167.4	167.4	209.25
1	Livestock improvement	725	108.75	145	145	145	181.25
2	Poultry	89	13.35	17.8	17.8	17.8	22.25
3	Fisheries	23	3.45	4.6	4.6	4.6	5.75
VII	Human Resources	1679	251.85	335.8	335.8	335.8	419.75
1	Additional man power requirement	1136	170.4	227.2	227.2	227.2	284
2	Capacity building of extension personnel	543	81.45	108.6	108.6	108.6	135.75
VIII	Research & Extension	582	87.3	116.4	116.4	116.4	145.5
IX	All Sectors & Schemes	22789	3418.35	4557.8	4557.8	4557.8	5697.25

Note: The funding proposal for the next five year plan is extracted from the comprehensive District Agriculture Plan. This plan excludes full amount of funds earmarked for development of irrigation and rural roads for connectivity and 50 per cent of the funds estimated for rural markets and water harvesting

II Comprehensive District Agriculture Plan: Sectoral Outlays and Yearly Allocation (Rs. Lakhs)

Sr. No.	Schemes	Total Plan	Yearly Allocation				
		Outlay	I	II	III	IV	V
I	Interventions to Improve and Enhance Sustainability of Crop Production System	4178	626.7	835.6	835.6	835.6	1044.5
1	Improvement of productivity of cereals, pulses, oilseeds, vegetables and spices crops through promotion of HYV seeds including hybrids	650	97.5	130	130	130	162.5
2	Improvement of soil health through vermi-composting, bio-fertilizers, micro nutrients, soil testing etc.	375	56.25	75	75	75	93.75
3	Protection of crops against biotic stresses (diseases, pests, weeds) and abiotic stresses (hail storms, drought, flash floods, etc) and other risk factors	100	15	20	20	20	25
4	Water use efficiency through micro irrigation	1200	180	240	240	240	300
	(i) Sprinkler	1100	165	220	220	220	275
	(ii) Drip	100					
5	Agricultural mechanization through popularization of improved tools and hill specific machinery like power tillers, tractors, crop planters/ harvesters, sprayers, clod breakers and gender friendly post-harvesting equipments to remove women drudgery	350	52.5	70	70	70	87.5
6	Protected (poly house) cultivation to minimize risk factors and enhance quality and productivity	1478	221.7	295.6	295.6	295.6	369.5
7	Strengthening and improvement of quality control infrastructure (seed, pesticides and fertilizer testing laboratories)	15	2.25	3	3	3	3.75
8	Strengthening of seed production farms and promotion of infrastructure to improve seed production and replacement	10	1.5	2	2	2	2.5
II	Need Based Infrastructure Development	8111	1216.65	1622.2	1622.2	1622.2	2027.75
1	Irrigation	5175	776.25	1035	1035	1035	1293.75
2	Improvement of on-farm water delivery and efficiency of existing irrigation systems	586	87.9	117.2	117.2	117.2	146.5
3	Rural markets	695	104.25	139	139	139	173.75
4	Rural roads for connectivity	1655	248.25	331	331	331	413.75
III	Natural Resource Conservation and Management	24291	3643.65	4858.2	4858.2	4858.2	6072.75
1.	Soil conservation of arable and non-arable land through engineering measures	909	136.35	181.8	181.8	181.8	227.25
2.	Water harvesting check dams, ponds, tanks, etc	22100	3315	4420	4420	4420	5525
3.	Land improvement	1282	192.3	256.4	256.4	256.4	320.5

IV	Niche Based Enterprises for Rural Entrepreneurs	1248	187.2	249.6	249.6	249.6	312
	(i) Organic farming	140	21	28	28	28	35
	(iii) Mushroom	768	115.2	153.6	153.6	153.6	192
	(iv) Sericulture	11	1.65	2.2	2.2	2.2	2.75
	(v) Agro-tourism	315	47.25	63	63	63	78.75
	(vi) Medicinal and aromatic plants	14	2.1	2.8	2.8	2.8	3.5
V	Fruit Production	90	13.5	18	18	18	22.5
VI	Livestock, Poultry & Fisheries	837	125.55	167.4	167.4	167.4	209.25
1	Livestock improvement	725	108.75	145	145	145	181.25
2	Poultry	89	13.35	17.8	17.8	17.8	22.25
3	Fisheries	23	3.45	4.6	4.6	4.6	5.75
VII	Human Resources	1679	251.85	335.8	335.8	335.8	419.75
1	Additional man power requirement	1136	170.4	227.2	227.2	227.2	284
2	Capacity building of extension personnel	543	81.45	108.6	108.6	108.6	135.75
VIII	Research & Extension	582	87.3	116.4	116.4	116.4	145.5
IX	All Sectors & Schemes	41016	6152.4	8203.2	8203.2	8203.2	10254

III. Projected Output Growth in Foodgrains and Vegetable Production

Crops	Existing			Potential Production (Mt)		Growth rate (% p.a.)	
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Scenario I	Scenario II	Scenario I	Scenario II
Maize	31721	62860	19.82	78049	71431	4.83	2.73
Paddy	2417	2528	10.46	3515	3249	7.82	5.71
Wheat	33641	43733	13.00	54782	50178	5.05	2.95
Barley	77	79	10.30	98	89	4.61	2.51
Pulses	70	49	7.01	60	55	4.61	2.51
Foodgrains	67933	109236	16.08	136805	125305	5.05	2.94
Vegetables	1499	32239	215.00	67628	153102	21.95	74.98

Note: Scenario I- output growth with increased irrigated area and crop improvement Programmes
Scenario II- output growth with diversion of 20 % irrigated area to high value cash crops

IV. Projected Output and Growth in the Production of Different Agricultural Crops

Crops	Existing			Potential			Growth rate in production (% p.a)
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Area (Ha)	Production (Mt)	Yield (Q/ha)	
Cereals	69461	138235	19.90	69461	180055	25.92	6.05
Maize	32,706	76,668	23.44	32,706	94,324	28.84	4.61
Paddy	1,949	4,195	21.52	1,949	4,814	24.70	2.95
Wheat	34,620	57,149	16.51	34,620	80,595	23.28	8.21
Barley	186	223	11.99	186	322	17.30	8.88
Pulses	585	330	5.64	585	507	8.67	10.73
Mash	352	173	4.91	352	270	7.68	11.21
Gram	219	151	6.89	219	229	10.45	10.33
Lentil	14	6	4.29	14	8	5.98	6.67
Total Foodgrains	70046	138565	19.78	70046	180562	25.78	6.06
Oilseeds	384	183	4.77	384	243	6.33	6.56
Sesame	116	32	2.76	116	43	3.69	6.88
Sarson	37	18	4.86	37	26	6.92	8.89
Toria	174	96	5.52	174	124	7.15	5.83
Gobhi Sarson	57	37	6.49	57	50	8.84	7.03
Vegetables	2886	33744	116.92	2886	44630	154.64	6.45
Tomato	92	2753	299.24	92	3157	343.17	2.93
Peas	117	916	78.29	117	1190	101.67	5.98
Bhindi	484	3472	71.74	484	4324	89.33	4.91
Cucumber	166	2904	174.94	166	3392	204.33	3.36
Bottle gourd	129	2501	193.88	129	3100	240.33	4.79
Bittergoard	103	916	88.93	103	1423	138.17	11.07
Brinjal	69	1244	180.29	69	1625	235.50	6.13
Capsicum	61	1115	182.79	61	1389	227.67	4.91
Cabbage	97	1396	143.92	97	1964	202.50	8.14
Cauliflower	215	3173	147.58	215	3759	174.83	3.69
Colocasia	261	2549	97.66	261	4698	180.00	16.86
Onion	246	2565	104.27	246	4104	166.83	12.00
Others	846	8240	97.40	846	10505	124.17	5.50
Spices	177	1412	79.77	177	2143	121.07	10.35
Ginger	75	495	66.00	75	834	111.17	13.70
Garlic	102	917	89.90	102	1309	128.33	8.55

Note: Projections are based on the estimated average yields and yields obtained by the progressive farmers

V. Projected Output and Growth in Fruit Production

Particulars	Existing			Potential			Growth rate in production (% p.a.)
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Area (Ha)	Production (Mt)	Yield (Q/ha)	
Mango	2730	2117	7.76	3655	5447	14.91	15.73
Citrus	1414	853	6.04	2007	1855	9.24	11.74
Guava	149	133	8.89	264	318	12.03	13.96
Pome granate	94	38	4.01	609	354	5.82	83.95
Litchi	261	131	5.02	316	264	8.34	10.12
Amla	216	146	6.77	341	309	9.06	11.12
Plum	154	38	2.50	244	118	4.84	20.70
Peach	109	57	5.23	304	226	7.42	29.54
Pear	116	111	9.56	211	279	13.18	15.04
Others	463	171	3.70	626	366	5.85	11.40

Note: i) For computation of growth rates, 10 year period was taken for harnessing the potential production

ii) Projections are based on the estimated average yields and yields obtained by the progressive farmers

VI. Projected Output and Growth in Milk Production

Particulars	Existing			Potential			Growth rate in production (% p.a.)
	Milch animals (No.)	Production ('000' L/day)	Milk Yield (L/day)	Milch animals (No.)	Production ('000' L/day)	Milk Yield (L/day)	
Crossbred cows	10595	35.96	6.17	10095	53.86	9.70	9.95
Local cow	2344	2.44	2.08	2000	3.26	3.26	6.72
Buffalo	101538	205.09	4.07	99038	393.76	7.95	18.40
Goats	29641	3.21	0.43	29641	4.43	0.60	7.59

Note : Projections are based on the estimated average yields and yields obtained by the progressive farmers

Interventions

- To ensure availability of quality inputs like improved seeds, fertilizers, plant protection material by improving and strengthening delivery system.
- Improvement of physical, chemical and biological parameters of soil on the basis of soil health cards proposed to be given to all farmers.
- Promotion of integrated nutrient management through vermi-composting, popularization of bio-fertilizers, and other ameliorants in addition to judicious and balanced nutrients to crops.
- Promotion of micro irrigation for efficient management and delivery of required quantities of water as per crop needs.
- Promotion of protected cultivation along with supporting infrastructure for quality production of high value cash crops.

- Promotion of mechanization conducive to hill farming and equipments and implements to reduce labour and drudgery of women folk.
- Strengthening and improvement of quality control infrastructure (seed, pesticides and fertilizer testing laboratories)
- Creation of monkey sanctuaries, planting of wild fruit species in the forests and taking other measures like sterilization to control the most serious problem of monkey menace as a consequence of which hundred of farmers in the district have abandoned cultivation.

Research and Extension Support

- Refinement and validation of technologies for different Agro-Ecological Situations (A.E.S) of the district.
- Transfer of technologies through extension interventions like need based trainings, demonstrations, exposure visits, replication of success stories, etc.
- Validation of Indigenous Technology Knowledge (ITK) available in the district for different agricultural practices on scientific lines for further replication.
- Use of Information Technology (IT) for technology dissemination by creating IT hubs at focal points for prompt action.
- To create a farm advisory system at least at block level or at circle level to address farmers' day-to-day queries with respect to management and disposal of produce.
- To promote Commodity Interest Groups (CIGs) and Farmers Federation at block or at district level.
- To promote and strengthen the public- private partnership for ensuring delivery of need based inputs and technologies at the farmers' door steps.
- Strengthening of feed back mechanism among farmers-extension workers and researchers for refinement and improvement in the Agricultural Technology.
- To provide the technology and support to the farmers/entrepreneurs in areas where water bodies (check dams) with perennial source of water have been created under watershed schemes.
- Improvement in local germplasm of mango, citrus and standardization of production techniques.

VII. Augmentation of Land and Water Resources: Physical Targets (Ha)

Blocks	Cultivated land	Potential cultivable land	Productive support land	Potential support land	Potential irrigated land	Irrigation potential through water harvesting
Tauni Devi	6201	6469	2402	1411	400	1000
Hamirpur	3900	310	2316	286	300	1400
Bhoranj	6121	645	2660	296	415	2000
Nadaun	7394	5108	2455	304	1342	2500
Bijhari	11129	1800	2993	370	310	1500
Sujanpur	2881	1815	1497	1300	875	440
District	37626	16147	14323	3967	3642	8840

VIII. Projected Fertilisers Demand by 2012-13 (Mt)

Fertilisers	Scenario-I	Scenario-II	Scenario-III
CAN	262.20	312.33	370.92
UREA	6951.30	8403.16	10122.45
IFFCO	1343.92	1628.89	1967.15
SSP	41.64	50.44	60.88
MOP	123.25	141.35	161.80

Note: (i) Scenario-I projects demand on the basis of growth rate of demand for different fertilisers during the last five years.

(ii) Scenario-II projects on the basis of growth rate of demand plus 2 per cent increase in demand arising from ongoing process of crop diversification in the district.

(iii) Scenario-III projects on the basis of growth rate of demand during the last five years plus 2 per cent growth in demand arising due to crop diversification plus additional 2 per cent increase in demand if the target of proposed area under irrigation is fulfilled.

IX. Projected Value of Output and Growth of Agriculture and Allied Sectors

Sector	Current value of output (Rs. Lakh)	Projected value of output (Rs. Lakh)	Growth rate (% p.a)
Agriculture	13855	18363	6.51
Horticulture	506	1270	15.09
Animal husbandry	13507	24928	16.91
Over-all	27868	44561	11.98

Note : Projections are based on the estimated average yields and yields obtained by the progressive farmers and farm gate prices of different commodities.

Interventions

- *In situ* soil and water conservation by employing different measures
- Improvement of support lands (Private Grasslands) by employing different measures for the control of invasive shrubs, weeds, etc. and planting suitable improved grass/fodder trees

- Use of water potential to provide assured irrigation to rain fed areas for increasing the productivity of existing crops and diversification towards cash crops
- Water harvesting to create water potential for irrigation and to augment ground water

X. Potential Enterprises for Gainful Employment

Sector	Enterprises
Farm	Protected cultivation, organic farming, sericulture, agro-tourism, medicinal and aromatic plants, mushroom production, nursery raising (vegetable, flower, fruit & medicinal plant).
Non-Farm	Vermi- culture/composting, mushroom compost units, rural craft, fruits and vegetable processing, bee keeping, dairying

XI. Human Resource Requirement (No.)

Block	Crop production	Horticulture	Animal husbandry	Others	Total
Tauni Devi	9	4	12	9	34
Hamirpur	9	6	10	15	40
Bhoranj	9	4	12	14	39
Nadaun	8	6	8	12	34
Bijhari	9	5	8	12	34
Sujanpur	11	4	13	13	41
District	55	29	63	75	222

Intervention

- Need based training to the extension personnel within and outside the country
- Exposure to places of success stories where exemplary success has been achieved in the improvement of farming systems

XII Expected Quantitative Outcomes

- Irrigation potential shall be created which will provide irrigation to an area of 12,482 hectares exploiting the available water resources and water harvesting through check dams, pond and tanks etc. With the implementation of plan and creation of irrigation infrastructure 33 per cent of the arable land will have assured irrigation facilities compared to existing 5 per cent.
- Available water potential shall be exploited and thereby 12,482 hectares of land shall be brought under cash crops by introducing vegetables in the traditional cropping systems as well as fruit plants and protected cultivation of red and yellow capsicum and flower plants.
- A huge chunk of land amounting to 16,147 hectares infested with soil erosion, stream bank erosion, etc. shall be treated by adopting soil conservation measures.

- Support land (private grasslands) of 18,300 hectares shall be treated against invasive weeds and shrubs. This shall improve the fodder production to the approximate level of 1,830 metric tonnes.
- Foodgrain production shall increase from 1,09,236 metric tonnes to 1,36,805 metric tonnes after the implementation of the plan thereby recording a growth rate of 5.05 per cent per annum in scenario I. In scenario II when 20 per cent of irrigated land is shifted to vegetable production, the growth rate in foodgrains production shall be 2.94 per cent per annum.
- Production of vegetables would increase from 32,239 metric tonnes to 67,628 metric tonnes in scenario I registering a growth rate of 21.95 per cent per annum when the proportion of area under these crops remains same and to 1,53,102 metric tonnes recording a growth rate of 74.98 per cent per annum in scenario II when 20 per cent of the irrigated area is brought under these crops. This will generate a marketable surplus of 1, 37,792 metric tonnes which, in monetary terms, amounts to Rs. 137.79 crores. The market disposal of this surplus shall generate huge employment opportunities for rural unemployed youth through forward and backward linkages.
- Based on the yields of average farmers and that of progressive farmers of different crops and the current area under different crops collected during field survey, the projected production of different crops have been worked out. The growth rate over the existing production in case of cereals, pulses and oilseed crops have been estimated at 6.05 per cent, 10.73 per cent and 6.56 per cent per annum, respectively. Among cereal highest growth is possible in barley (8.88 per cent) followed by wheat (8.21 per cent). Among pulses, mash registered the highest growth of 11.21 per cent followed by gram. The overall growth in foodgrains is 6.06 per cent per annum. The overall growth in production of vegetables is 6.45 per cent in which highest growth is expected in colocasia (16.86 per cent) followed by ginger (13.70 per cent), onion (12.00 per cent) and bitter gourd (11.07 per cent).
- Mango, citrus, guava and aonla are traditionally grown fruits in the district where as pomegranate, litchi, plum, peach and pear are newly adopted fruit crops. Based on yields of progressive farmers and the yield of the average farmer, the production of different fruits is expected to register higher growth rates i.e 15.73, 13.96, 11.74 and 11.12 per cent in case of mango, guava, citrus and aonla, respectively. In case of newly adopted fruits, the annual growth was found the highest in case of pomegranate (83.95 per cent) followed by peach (29.54 per cent) and plum (20.70 per cent). The growth in case of pomegranate is higher because it is resistant to insect pest and diseases and less perishable when compared to others
- Through the implementation of plan, the milk production in the district is expected to increase from the existing level of 246.7 thousand liters per day to 455.31 thousand liters per day from different livestock categories. Among the different categories, the expected

increase in milk yield is 18.40, 9.95 and 6.72 per cent in case of buffaloes, crossbred cows and local cows, respectively

- The demand for different types of fertilisers like CAN, UREA, IFFCO (12:32:16), SSP and MOP is projected to increase to 2,62.20, 6,951.30, 1,343.92, 41.64 and 123.25 metric tonnes, respectively by the year 2012-13 under scenario I. Under scenario II, the demand for these fertilisers is projected to increase to 312.33, 8,403.16, 1,628.89, 50.44 and 141.35 metric tonnes respectively. And in scenario III, it is projected to increase to 370.92, 10,122.45, 1,967.15, 60.88 and 161.80 metric tonnes, respectively
- The projected sectoral growth rates are 6.51 per cent for agriculture, 15.09 per cent for horticulture and 16.91 per cent for animal husbandry. The overall agricultural growth rate is projected at 11.98 per cent per annum during the plan period

XIII Researchable Issues

Crop Production

- Characterization and classification of soils.
- Delineation of the Acid Soil Regions (ASR).
- Integrated Nutrient Management (INM) technology demonstration on farm fields.
- Issues in solid waste management for organic farming in major cash crops of respective region.
- Evaluation of resource conservation technologies (like conservation tillage, deficit water management, pressurized irrigation systems, nutrient-water interaction studies, recycling of waste organic residues etc.) for irrigated and rain fed areas.
- Issues related to increasing water productivity of stored water through crop diversification and soil and water management practices.
- Development of high yielding varieties of various crops having wider adaptability and resistance to various biotic and abiotic stresses, through exploitation of land races, agronomic basis and alien species using conventional as well as non-conventional breeding approaches.
- Refinement in the technology and development of improved varieties of various niche based crops such as special purpose corn e.g. baby corn, sweet corn, and pop corn.
- Development of hybrid varieties of maize and rice to raise overall productivity of these two important crops.
- Concerted efforts on ensuring effective selection, conservation, evaluation, documentation and utilization of genetic resources.

- Formulation of bio-intensive IPM strategies for the management of *Helicoverpa armigera* (tomato and gram), fruit flies (cucurbits and tomatoes), white grubs (potato, maize, peas, ginger, cabbage etc), cut worms (cereals and vegetables); fruit borer (brinjal and okra), leaf miner and pod borer (peas), hairy caterpillar (mash, til, soybean), stem borer and aphids (maize), mites (pulses and vegetables) and plant parasitic nematodes (cereals and vegetables). Insect pest and nematode management under protected cultivation situations.
- Management of insecticide resistance in field populations of *Helicoverpa armigera*, *Spodoptera litu*, *Leucinodes orbonalis* and *Trialeurodes vaporariorum*.
- Collection and utilization of local strains of entomopathogenic organisms for insect-pest management under organic farming situations.
- Identification and utilization of native botanicals for eco-friendly pest management.
- Germplasm screening for resistance against major insect and pests (cereals, pulses, oilseeds and vegetables).
- Survey and surveillance for identification of new invasion of insect pests and major diseases.
- Safe management alternatives for the stored grain pests.
- Identification and management of insect-pests of medicinal, aromatic and ornamental plants.
- Development/identification of bacterial wilt resistant hybrids/varieties of *solanaceous* vegetables.
- Development/identification of hybrids and varieties of potential vegetable crops
- Development of hybrids and production technology for protected cultivation.
- Identification of vegetable based promising cropping sequences.
- Standardization of agro-technology for organic vegetable production.
- Development/refinement of production technology in ginger and colocasia.
- Standardization of production technology of hybrids.
- Standardization of production technology for rain fed cultivation of potential vegetable crops.

- Identification of resistant sources and study of genes of resistance.
- Marker assisted selection of resistant genes using molecular markers and their use in gene pyramiding for resistance in commercial varieties.
- Development of integrated disease management modules suitable for organic and protected agriculture conditions.
- Development of detection techniques for pathogens of quarantine importance and certification purposes.
- Development of IDM module.
- Analysing trends and patterns of prices and markets of emerging crops and enterprises in the context of ongoing process of globalization.
- Understanding economic implications of climate change towards cropping systems, cropping patterns and livelihoods of the farmers.
- Assessing impact of the on-going process of crop diversification on natural resource base (soil, water and environment) and its implications towards livelihoods of the farmers.

Animal Husbandry

- Documentation of Ethno-Veterinary Practices (ITK) followed by farmers for testing their scientific validity for replication and mass commutation.
- Studies on routine and immunodiagnosis of parasitic aetiopathogen causing neonatal diarrhoea and mortality in calves.
- Monkey menace: Socio-biological issues, economic implications and remedial strategy to tackle it
- The stray cattle menace: A technical study into its genesis for its sustainable remedy.
- Studies on the poisonous plants of the district, characterization of their toxic anti-nutritional factors and easy methods to ameliorate their deleterious effects.
- Strategic mineral supplementation in animals to improve profitability of livestock owners of the district.
- Investigations on the etiological agents of infectious infertility among bovine, ovine and caprine including male animals with special emphasis on *Brucella*, *Chlamydia*, *Mycobacterium* and fungal agents.
- Investigations on the epidemiology and serodiagnosis of *Mycobacterium bovis* infection in bovines.

- To develop endocrinological tools to augment production and reproduction in dairy animals.
- Diagnostic imaging for early and accurate management of surgical afflictions in animals.
- Survey of prevalence of acarine fauna of veterinary importance involved in tick typhus.
- Issues related to animal health problems by livestock farmers of migratory routes used in Hamirpur district
- Development of an Integrated Livestock Production Model (ILPM) for cattle, fish and poultry for farmers of district Hamirpur.
- Refinement in existing fodder preservation techniques.
- Development of a profitable dairy husbandry package for mid-hill livestock farmers in the face of the in-coming 'LIVESTOCK REVOLUTION 2020
- Molecular diagnosis and genetic diversity analysis of important pathogens responsible for major animal and poultry diseases and zoonoses in North-West Himalayan region of India.
- Standardization and further application of endoscopic and laproscopic techniques in clinical cases of abdominal disorders in small and large animals.

Horticulture

- Delineation of frost prone areas and recommendation of suitable fruits/varieties for those areas.
- Development of technology for frost management.
- Management of mango mealy bug with emphasis on bio-rational methods
- Development of management strategies for mango malformation and diseases.
- Research on controlling fruit cracks and fruit drops in litchi.
- Development of efficient propagation techniques for litchi, mango, aonla, etc.
- Development of techniques for adjusting flowering in fruit crops as per market demands.
- Generation of data base of pollinator diversity in different horticultural crops

- Identification of potential bee keeping belts of the district along with strategies to assure the availability of bee flora.
- Identification of safe waiting periods of pesticides on horticultural crops
- The development of regular bearing varieties in case of mango and other fruit crops
- Development of packages and practices for the cultivation of wild and local importance fruits like fig, jamun, reetha (soap nut), bael (wood apple), ber, rubus, kainth, lusura (*Cardia mixac*) etc.
- Development of apple, kiwi and pear fruit varieties with low chilling requirements.
- Identification of niche area and remapping of different fruit growing belts
- Diversification of fruits and their varieties with under utilized fruits
- To develop technology for improving water and fertilizer use efficiency in different fruit crops
- Integrated pest/disease management modules for different fruit crops grown in the district.
- Integrated nutrient management in mango, citrus, guava, pomegranate, aonla and other fruit crops.
- Development and finalization of package of recommendation for growing the high value cash crops under protected cultivation round the year utilizing poly houses for zone-I.

XIV Sum UP

In brief, the implementation of District Agricultural Plan (DAP) shall strengthen and improve the physical and institutional infrastructure and shall restore, rejuvenate, conserve and enhance the health of the available natural resource base. It shall also give a big boost to the ongoing process of crop diversification towards high value cash crop agriculture including high value off-season vegetables and other niche based enterprises generating huge employment opportunities for the rural unemployed youth. In concrete terms, the implementation of the plan shall go a long way in ensuring ecological sustainability and economic viability of the production systems of the district.

Chapter-I

INTRODUCTION

1.1 Background

Planning is an act or process of preparing or carrying out a focussed activity with goals, procedures and policies for economic emancipation of a social or economic unit in a given time frame. The document containing goals, targets and policies to accomplish plan targets is defined as plan. Planning in the context of district agricultural plans is an exercise of preparing an integrated plan considering available resources and encompassing all sectoral activities and schemes being carried out by the government or non-government organisations in a local government area such as panchayat, block/taluka or district. Accordingly, the plan thus prepared is called panchayat or block or district plan. The process of democratic decentralised planning in India dates back to the First Five-Year Plan (1951-1956) which underlined the need to break up the planning exercise into national, state, district and community levels. Two new elements, namely, establishment of District Development Council and drawing up of village plans and people's participation in planning process through democratic decisions were added in the Second Five Year Plan following the recommendations of Balwant Rai Mehta Committee in 1957. Several new elements have been added to strengthen the process of decentralised planning in the subsequent plans. The importance of preparing panchayat/block/district plan lies in involving the people at the grassroots/stakeholders level and those who are responsible for implementing these plans. The Administrative Reforms Commission in 1967 highlighted that planning needed to be focussed in those areas where local variations in pattern and process of development were likely to yield quick results. The Planning Commission issued guidelines to the state governments for formulating district plans in 1969. These guidelines provided details regarding the concept and methodology for drawing up these plans in a framework of annual, medium and perspective plans. The recommendations of several other Committees, namely, Danatwala (1978), Hanumantha Rao (1984) and GVK Rao 1985 were instrumental in the concretisation of the idea and concept of District Plans.

The preparation of these plans assumed special significance in the aftermath of the 73rd and 74th constitutional amendments which conferred constitutional status to panchayats at district and sub-district levels and local self-government in urban areas. Article 243 ZD of the constitution provides for the procedure for the constitution of District Planning Committee at the district level to consolidate the plans prepared by the panchayats and municipalities and prepare draft development plan for the whole district. The important functions proposed for the district planning committee include, *inter alia*, to (i) consolidate plans prepared by the panchayats at different levels of the rural local and urban bodies; (ii) assess the development disparity that exists between or among village panchayats, block panchayats and municipalities and identify the basic reasons for these disparities; (iii) identify and prioritize the schemes for the development of district conforming to the objectives of the state and central governments; (iv) formulate objectives and strategies for the identification and prioritization of the schemes for the district. As per the guidelines, the preparation of district level plans have to precede, among others, by the complete assignment of the activities to be undertaken by different levels of local government, formation of District Planning Committees (DPCs).

The current crisis in agricultural sector has once again brought up the importance of preparing district agricultural plans taking into account myriad of agro-climatic niches, problems and potentials in each of the district in the country. As is well known, performance of Indian economy has been a global success story. While it has been growing at a rate of 6 per cent per annum since 1993, the growth rate has been an astonishing 9 per cent during the last four years. This is in stark contrast to the growth rate in Indian agriculture which has witnessed sharp deceleration during the last decade or so. The growth rate has plummeted from a 3.62 per cent per annum during the period of 1984-85 to 1995-96 to less than 2 per cent in the subsequent period of 1995-96 to 2004-05. Agricultural growth was slightly above two per cent during 2006-07 but much lower than the target growth rate of 4 per cent. In brief, Indian agriculture is in a crisis which is unprecedented. The sordid state of affairs has been attributed, among others, to technology fatigue versus policy fatigue and persistent neglect of agriculture and gradual withdrawal of state from active participation in development activities. It is evident from declining plan outlay, declining public sector capital formation, dwindling credit supply which is manifested in fact that the growth rate of institutional credit to agriculture has declined from about 6.64 per cent during 1981-91 to 2.16 per cent during 1991-99, decrease in the use of critical inputs, increase in the cost of production, faulty price policy in terms of mismatch between minimum support price (MSP) and coverage of commodities under MSP scheme. Likewise, neglect of agricultural research and extension, technology fatigue manifested in stagnation/deceleration in growth of yields of important crops like wheat, practically no increase in area under irrigation despite launching Accelerated Irrigation Benefit Programme (AIBP) in 1996-97. Between 1995-96 and 2003-04 both central and state governments have spent nearly Rs. 35,000 crores but the net irrigated area has remained static at around 53-55 million hectares, the poor growth in surface irrigation has obliged farmers to depend heavily on ground water exploitation thereby depleting ground water resources and increasing cost of production and fall in the rate of growth of employment opportunities. While the overall employment growth declined from 1.74 per cent between 1983-84 and 1993-94 to 1.08 per cent between 1993-94 and 2003-04, in agriculture it decreased from 1.41 per cent to 0.63 per cent. The net result has been dwindling income of the farmers culminating in increasing number of farmers' suicides.

The Eleventh Five -Year Plan (2007-2012) has set a target of 4 per cent for agricultural sector and 9 per cent annual growth for the economy as a whole. To accomplish this rate of growth, centre has emphasised fast and inclusive growth, especially of agricultural sector, so that the benefits of growth percolates down to the most vulnerable sections of the society like landless labour, marginal and small farmers, scheduled caste, scheduled tribes, women, and so on. A number of new initiatives have been launched to revive growth in agriculture. One of such important innovation that has been introduced in the Eleventh Five Year- Plan is Rashtriya Krishi Vikas Yojna (RKVY) with an outlay of Rs. 25,000 crores to give states more flexibility and autonomy in planning and executing programmes for agriculture, achieve goals of bridging the yield gaps in important crops, maximise returns to the farmers, incentivise them to spend more on agricultural sector and address the agriculture and allied sectors in an integrated manner. The funds under this scheme would be provided to the states as 100 per cent grant by the central government. An outlay of Rs. 1500 crores has been approved for 2007-08. The financial assistance provided to the state governments from this centrally sponsored scheme is subject to fulfillment of certain conditions. First, the expenditure on agriculture by the state governments is higher than the base period, which is defined as the moving average of the expenditure of the preceding three years. Second, the preparation of district and state agricultural plans is

mandatory. The areas like integrated development of food crops including coarse cereals, minor millets and pulses, agricultural mechanizations, soil health and productivity, development of rain-fed farming systems, integrated pest management, market infrastructure, horticulture, animal husbandry, dairying and fisheries, completion of projects that have definite time lines, support to institutions that promote agriculture and horticulture, etc organic and bio-fertilisers are given priority. The District Agricultural Plan (DAP) should determine each district's final resource envelops its production plan and the associated input plan. It has also been emphasized to integrate these district level agricultural plans with the state plans.

Against above background, the Himachal Pradesh State Department of Agriculture entrusted the task of preparing these plans to Agricultural University, Palampur as per the guidelines issued by the planning commission. The guidelines entail collection and analysis of data on parameters such as land utilization, farming systems, cropping pattern, horticulture, input use, farm machinery, yield and input gaps, issues in livestock management, fisheries, livelihoods of local population, different ongoing irrigation and watershed programmes/schemes, potential for new schemes, women drudgery, post harvest operations, market infrastructure, and so on at the village/panchayats levels. The methodological framework to prepare these plans got evolved in a series of consultations with the officials of the line departments like agriculture and horticulture and the scientists working at different KVKs and regional research stations. The details of the methodological framework have been provided in succeeding paragraphs.

1.2 Data and Methods

In the literature on methodologies in social sciences, there are five main approaches, namely, sample surveys, rapid appraisal, participant observation, case studies and participatory learning and action to conduct a research inquiry. The reliability and generalisability of the findings of any study hinges on the methodology followed to conduct the study. The adoption of a particular approach or amalgam of different approaches, however, is contingent on a variety of factors most notably, the objectives of the proposed research inquiry, the proposed use of the findings, the required level of reliability of results, complexity of the research area/programme and, of course, the availability of resources in terms of both money and time. The merits and demerits of different approaches have been described in Hulme¹, 2000, pp. 79-98. The present chapter is, therefore, devoted to explain methodological framework adopted to prepare district agricultural plans.

1.2.1 Sampling Plan

The state has been divided into 77 developmental blocks. Though, all the developmental blocks in the state were taken, sampling approach was adopted to select the panchayats. The sample panchayats were selected in such a way so that variations in micro climatic niches, farming systems and cropping patterns in a particular block were captured. To meet this requirement, it was decided to select 10 per cent of the total panchayats from each of the block with a minimum of four panchayats in those districts, where number of panchayats was more than 200. In other districts, where number of panchayats was less than 200, 15 per cent of the panchayats were selected again with a minimum condition of selecting four panchayats in a block. Wherever 10 per cent or 15 per cent of the total panchayats from a block was not an integer (5.5 say), in those cases, the next higher integer (say 6) was taken. There are six blocks in the district and following

this methodology, the number of panchayats selected in district Hamirpur was 28. The details of the sample panchayats selected from each block are provided in Table 1 .1.

Table 1.1 Sampling Plan

Block	Total panchayats	No. of selected panchayats	Name of selected panchayats
Tauni Devi	46	5	Kanjian, Samirpur, Guararu, Patnaun and Dugha
Hamirpur	24	4	Kuthera, Khiah, Dhaned and Neri,
Bhoranj	33	4	Dhamrol, Patta, Tal and Ludar Mahadev,
Nadaun	58	6	Nariah, Saproh, Nara, Kotla Chillian, Sanahi and Gwal Pather
Bijhari	48	5	Sour, Dalchera, Jaure Amb, Jamli and Dabriana
Sujanpur	20	4	Patlander, Bir Baghera, Bannal, Tihara
District	229	28	

1.2.2 Survey Tools

Guided by the parameters given in guidelines issued by the Planning Commission for the preparation of these plans and discussions held with the officials of department of agriculture, different aspects on which data were to be collected had been divided in two parts. First, those on which data were to be collected at block level. Second, those on which data were to be collected at panchayat level. Accordingly, two questionnaires were developed which were discussed with different stakeholders and officials of line departments before finalizing. These questionnaires were administered in all blocks and sample panchayats. The data were collected following participatory rural appraisal (PRA) approach. The officers of the line departments, namely, agriculture, horticulture and animal husbandry and panchayat pradhans including two-three progressive farmers participated in the data collection process.

1.2.3 Analytical Tools

The data were analysed following appropriate statistical tools. Since the data were collected from sample panchayats, the estimates arrived at were required to be blown up for the block as a whole. For blowing up these estimates, the statistical tools like percentages, simple and weighted averages and standard deviations of different parameters were computed. The averages then were multiplied with the total number of panchayats in a particular block to arrive at the estimates for the whole block. In some cases, depending upon the nature of parameters, one standard deviation was added to the average to arrive at estimates at the block level. The problems, suggestions and interventions suggested by the grass root level functionaries were coded. Based upon these codes, frequency tables were generated and different problems and interventions were prioritised and five most important problems and interventions were considered for preparing plan estimates. The interventions required to solve different problems and to exploit the available potential in different areas, the interventions were divided into three categories namely, research, extension and development. The funds for these interventions were then worked out in

consultation with the stakeholders. The financial requirements for other parameters like irrigation, watershed schemes, infrastructure, markets, and so on were prepared in consultation with the district level officials of the line departments like agriculture, horticulture, animal husbandry and irrigation. The state level plans were prepared on the basis of different district agricultural plans.

1.2.4 Limitations

For the preparation of the district agricultural plans strictly according to the guidelines issued by the Planning Commission, the data on different parameters should have been collected at the village level. This, however, could not be done due to time constraint. Currently, while most of the data are being collected and prepared at tehsil level, the developmental schemes are being implemented at block level whose geographical area seldom coincides with that of tehsil. This led to some problems in generating estimates for the whole block.

Note

¹ Hulme, David (2000), Impact Assessment Methodology for Micro Finance, Theory, Experience and Better Practices. *World Development*, 28 (1): 79-98

Chapter-II

GENERAL DESCRIPTION OF THE DISTRICT

2.1 Background

2.1.1 Location

District Hamirpur came into existence as a full fledged district on 1st September, 1972. Earlier it was a tehsil of Kangra district. During the old times, Kangra was dominated by the Katoch successors. The king, Hamir Chand first time built up a fort in the district, since then it has been called as Hamirpur. Hamirpur is situated between 76° 13” and 76° 44” on East longitudes and 31° 52” and 31° 58” North latitudes. The elevation of the district above mean sea level varies between 400 – 1,232 meters. Area wise, it is the smallest district among twelve district of the state and is situated at the centre of the state. The area falls under the middle and upper Shivalik ranges and has the most fragile ecosystem. The area falls under the sub-montane low hill zone (Zone-I) of Himachal Pradesh having slopping and undulating topography. Besides having a number of places of scenic beauty, the district has a few places of religious importance. Of these, Baba Balak Nath at Deotsidh is the sacred place, where lakhs of pilgrims from all over India and abroad visit every year. Besides, Chugan and fort at Sujanpur Tihra, is a place of historical importance.

2.1.2 Boundaries

The district shares its boundaries with four districts of state. It is bound by Kangra district in the north, Mandi district in the north east, Bilaspur and Una districts in the south east and south, respectively. Hamirpur district comprises of six tehsils/ sub-tehsils. Among these Nadaun, Sujanpur Tihra, Hamirpur, Bhoranj and Barsar are tehsils and Dhatwal is sub- tehsil. From the administrative point of view, the district has been divided into six developmental blocks viz. Hamipur, Bhoranj, Nadaun, Bijhari, Sujanpur and Tauni Devi. There are 229 Panchayats and 1, 672 villages among which 1,635 villages are inhabited and 37 are uninhabited. There are also five towns i.e. Hamipur, Barsar, Nadaun, Bijhari and Sujanpur. Two National Highways (Jalandhar –Manali and Shimla-Dharamshala (NH-88 and NH-70)) pass through the district.

2.2 Physiographic Features

2.2.1 Area

Area-wise, the district is the smallest among the twelve districts of the state. The total geographical area of the district is 1,10,070 hectares which accounts for 2.1 per cent of the total geographical area of the state. According to Surveyor of India, the total geographical area of the district is 1,118 sq.km which supports 4, 12,700 human, 2,03,896 livestock population and other species of flora and fauna. Of the total population of the district, 3, 82, 494 inhabit in rural areas and 30, 206 people are urban dwellers.

2.2.2 Seasons and Climate

District falls in the sub-humid sub-tropical zone and has a relatively mild climate during the year. The winter season prevails from November to March, spring from April to May and summer

from June to September and transitional season from October to November. May and June are the hottest months of the year where the mercury levels usually more than 30° C and December and January are coldest months where the nights experience a temperature of around 8-10° C. In the months of December/January, there is occurrence of severe frosts which cause injuries to a number of field as well as fruit crops e.g mango, papaya etc. In general, the minimum temperature in the winters goes to 4° C and rises to the maximum limit of 34° C in summer. Except these months of the year, the general, climate in the district is mild as it receives a fairly good quantum of monsoon rains which support the plantation in the forests, pastures and inhabited areas with lush green grasses and vegetation.

2.2.3 Rainfall

District Hamirpur receives a good quantum of annual rainfall. There are two seasons of rainfall during the year, one from December to March, associated with the passage of western disturbances and the other which is the main one, extending from middle of June till middle of September, caused by the south west monsoon. The trend of number of rainy days and the total annual rainfall received in the district w.e.f 1990-91 to 2006-07 has been presented in Table 2.1. It can be observed from the table that the pattern of rainfall over the period has been erratic. Highest total rainfall of 2,144 mm was received during 1990-91 and lowest of 1113 mm during 1993-94. The total number of highest rainy days in a year was 110 during 1992-93 followed by 107 during 1994-95. Despite good number of rainy days and total annual rainfall, usually *Rabi* crops and *Kharif* crops in some cases face the moisture stress conditions at the critical growth periods which reduce the yield levels to greater extent. This is mainly due to the uneven distribution to rainfall during the years.

Table 2.1 Trend in Average Annual Rainfall; 1990-91 to 2006-07

Year	No. of rainy days	Total rainfall (mm)
1990-91	99	2144
1991-92	78	1183
1992-93	110	2114
1993-94	97	1113
1994-95	107	1493
1995-96	74	1514
1996-97	81	1304
1997-98	79	1796
1998-99	62	1144
1999-2K	57	1168
2000-01	69	1191
2001-02	57	1187
2002-03	52	1131
2003-04	58	1315
2004-05	60	1392
2005-06	54	1126
2006-07	70	1630

Source: Annual Season and Crop Reports, Different Issues, Directorate of Land Records, Government of Himachal Pradesh.

2.2.4 Soils

Physiographically, the district can be divided into two tracts i.e. rainfed hilly tract and rainfed and irrigated valley tract. The majority of the soils of rainfed hilly tract fall under the antisol and the inceptisol orders. The soils of this tract are shallow and moderately deep with incipient profile development. The texture varies from loamy sand to sandy loam having stony surface. Soils are neutral in reaction (6.5-7.0), available N & P are low and K is medium. Soils have low water holding capacity and susceptible to soil erosion. The soils of the rainfed and irrigated valley tract fall under the antisols, inceptisols and alfisos orders. The soils show incipient to moderate profile development. Soil texture varies between loamy sand to clay loam. Soil reaction is neutral and rarely acidic. N and P are low to medium and K is medium. The soil depth is low to medium with low water holding capacity. The soils of some parts of developmental blocks of Sujapur, Bhoranj, Hamirpur, parts of Bijhari are shallow and have gravels.

2.2.5 Forests

The total area under forest cover is 20206 ha which accounts for about 19 per cent of the total geographical area of the district. The forest area falls under the Hamirpur forest division. For management purpose, the area has been divided into Hamirpur, Aghar, Bijhari, Barsar and Nadaun ranges. In the district, the major tree species is chil (*Pinus roxburghii*) which is found as pure as well as chil with scrub forest. These species are found in the DPF/UPF as well in the private lands of the people. The major product of chil forest is timber and resin production. Earlier there was provision of TD rights (fuel/timber wood grazing of animals etc) to inhabitants of the villages adjoining to the forest areas. The second economic tree species found in the forest areas of the district is khair (*Acacia catechu*) which is prevalent in Nadaun and Barsar ranges. The major product of khair tree is katha.

2.2.6 Flora and Fauna

The district has diversified flora in the form of trees, shrubs and grasses. The major trees species found in the district are *Acacia catechu* (Khair), *Grewia optiva*, *Bauhinia variegata* (Khanar), *Emblia officinalis* (Aonla), *Bambusa aurandinalis* (Bans) *Zizyphus mauritiana* (Ber), *Bombax ceiba* (Simbal) *Magifera indica* (mango), *Ficus carica* (Fig), *Pyrus pashia* (Kainth), *Celtis australis* (Khir), *Toona citiata* (Tuni), *Syzygium cumini* (Jamun) *Terminalia chebula* (Harar) and *Terminalia belerica* (Behra). These are found in the forests, private lands and are being used for providing fuel wood, fodder, timber and fruits etc. In addition to these, there are numerous shrubs and bushes adapted to the climatic conditions of the district such as *Carissa spinarum*, *Zeromphus sionaosa*, *Mimosa himalayana*, *Nyctanthes arbortristis*, *Dodnaea viscosa*, *Woodfordia fruticosa*, *Adhatoda vasica*, *Murraya koeingi*, *Zizyphus mauritiana*, *Vitex eigundu*, *Indigofera dosha*, *Carissa opaca*, *Chlorophytum sp.* *Cascuta reflexa* and *Saccharam sp.*

The major grass species found in the grassland and pastures of the district are *Chrysopogon montanus* (Dholoo), *Heteropogon contours* (Lamloo), *Themeda athera* (Lunji), *Culaliopsis binata* (Baggar), *Bothriochloa pertusa* (Makora.) *Brachiaria multica* (Para grass) *Aristida sp.* and *Cynolon detilon* (Doob/Khabbal).

This district once used to be quite rich in wild life and other fauna. With continuous increase in the human population, increase in the cultivated area and developmental activities such as construction of roads etc. some species of wild life are at the verge of extinction. The main reasons for the decline of wild life in the tract are indiscriminate shooting/hunting and forest fires. The major species of the mammals found in the area are *Felis bengalensis* (Leopard cat), *Felis chane* (Jungle cat), Muntucus (Barking Deer), *Vulpes bengalensis* (Fox) *Camis aureus* (Jackal), *Mucaca mulatto* (Monkey) *Preshytes entellus* (Langoor Common) *Sus sacrofa* (Wild boar), *Hystrix indica* (Porcupine) and *Lepus nigrioilis* (Hare). Among the birds, *Milvus migrant* (Vulture), *Eudynamys scolopacca* (Koel), *Coluba livia* (Pigeon), *Caracias bengalesis* (Blue jay), *Columbs livia* (Hawk), *Francolius francolinus* (Black partridge), *Francolius pondicerianus* (grey partridge), *Payo crislatus* (Pea cock), *Coturnix coturnix* (Common quail), *Alectoris graeca* (Chakore), *Corvus splendens* (Crow) and *Prottacula Karmeri* (Parrot) are common in this area.

2.3 Demographic Features

The population related indicators of district Hamirpur along with state level indicators has been presented in Table 2.2. The total population of the district as per census 1991 was 3,69,128 which has increased to 4,12,700 in 2001 showing a decadal growth rate of 11.62 per cent. The growth rate of state as a whole for the same period is 17.39 per cent. The total population of the district accounts for 6.79 per cent of total population of the state. The table reveals that the density of population was 330 and 369 persons per square kilometer for 1991 and 2001 census respectively. The density of population in district Hamirpur is quite high (more than three times) as compared to the overall population density of state, which indicates the higher pressure on existing natural resources. The sex ratio of the district was 1,099 during 2001. The educational status of both male and female population has improved in the district. The overall literacy of the district was 74.88 and 82.50 per cent during 1991 and 2001, respectively. The corresponding figures for the state as a whole were 63.86 and 77.13 per cent.

Table 2.2 Demographic Features of District Hamirpur

Particulars	Year	Population (No.)					Literacy %		
		Person	% to state	Decadal growth	Density/ sq km	Sex ratio	Male	Female	Total
Hamirpur	1991	369128	7.14	16.17	330	1105	85.11	65.90	74.88
	2001	412700	6.79	11.62	369	1099	90.20	75.70	82.50
H. P.	1991	5170877	100.00	20.79	93	976	75.36	52.13	63.86
	2001	6077900	100.00	17.39	109	970	86.02	68.08	77.13

Source: Census of HP, 1991 & 2001

Tehsil wise distribution of total population of the district has been presented in Table 2.3. It can be seen from the table that the total population of Hamirpur was highest i.e. 1,11,210 (26.95 Per cent) followed by Nadaun 91,410 (22.15 per cent) and minimum in Dhatwal (ST) (8.44 Per cent). Sex ratio (female per 1000 males) was highest in Dhatwal (ST) and minimum in Hamirpur tehsil. The majority of total population of all tehsils of district is rural, which varies between 83.61 to 100 per cent (Table 2.4 and Table 2.5). The percentage of urban population in Hamirpur

and Sujanpur tehsils was around 14 per cent whereas the urban population in Bhoranj and Dhatwal (ST) was nil as all the people resided in rural areas.

Table 2.3: Tehsil Wise Demographic Features of District Hamirpur, 2001

(Per Cent)

Tehsil	Person	Male	Female	Sex ratio per 000 male
Nadaun	22.15	12.02	22.25	1110
Sujanpur Tihra	10.46	5.76	10.37	1079
Dhatwal (ST)	8.44	4.57	8.49	1114
Hamirpur	26.95	1.50	26.49	1061
Bhoranj	19.87	10.67	20.14	1132
Barsar	12.14	65.49	12.25	1121
District	100	100	100	1099

Source: Primary Census Abstract of Himachal Pradesh-Series 3, Census of India, Directorate of Census Operations, Himachal Pradesh, Shimla

Table 2.4 Tehsil Wise Rural and Urban Population of District Hamirpur, 2001

Tehsil	Total			Rural			Urban		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
Nadaun	91410	43327	48083	87005	41078	45927	4405	2249	2156
Sujanpur Tihra	43189	20772	22417	36112	16893	19219	7077	3879	3198
Dhatwal (ST)	34816	16469	18347	34816	16469	18347	-	-	-
Hamirpur	111210	5395	57256	93958	44627	49331	17252	93279	7925
Bhoranj	81985	38456	43529	81985	38456	43529	-	-	-
Barsar	50090	236115	26475	48618	22843	25775	1472	772	700
District	412700	360534	216107	382494	80366	202128	30206	100179	13979

Source: Primary Census Abstract of Himachal Pradesh-Series 3, Census of India, Directorate of Census Operations, Himachal Pradesh, Shimla

Table 2.5 Tehsil Wise Proportion of Rural & Urban Population of District Hamirpur, 2001

Tehsil	Rural			Urban		
	Persons	Male	Female	Persons	Male	Female
Nadaun	95.18	94.81	95.52	4.82	5.19	4.48
Sujanpur Tihra	83.61	81.33	85.73	16.39	18.67	14.27
Dhatwal (ST)	100.00	100.00	100.00	-	-	-
Hamirpur	84.49	82.71	86.16	15.51	17.29	13.84
Bhoranj	100.00	100.00	100.00	-	-	-
Barsar	97.06	96.73	97.36	2.94	3.27	2.64
District	92.68	91.75	93.53	7.32	8.25	6.47

Source: Primary Census Abstract of Himachal Pradesh-Series 3, Census of India, Directorate of Census Operations, Himachal Pradesh, Shimla

Agriculture in hilly areas is not fully mechanized and most of the agricultural operations are taken up by the manual labour. Therefore, to promote agricultural enterprises, there is need to

study the composition of various type of workers. The distribution of workers in district as well as in the state has been presented in Table 2.6 and Table 2.7. It can be seen from Table 2.6 that in district Hamirpur the total workforce is around 50 per cent of the total population. The percentage of total male workers is slightly higher as compared to female counterpart both at district as well as at state level. However, the percentage female marginal workers are higher as compared to male marginal workers in the district as well as in the state. The percentage of main and marginal workers to the total population in the district is 29.04 and 20.73, respectively. The corresponding figures for the state are about 32 and 17 per cent of the total population. The proportion of main workers to the total workforce is higher as compared to the marginal workers at district and state level (Table 2.7).

Table 2.6 Proportion of Workers to Total Population, 2001

(No.)

Particulars	Person	Male	Female
Hamirpur			
Total population	412700	196593	216107
Total workers	205405 (49.77)	100067 (50.90)	105338 (48.74)
Main workers	119870 (29.04)	69496 (35.35)	50374 (23.31)
Marginal workers	85535 (20.73)	30571 (15.55)	54964 (25.43)
Himachal Pradesh			
Population	6077900	3087940	2989960
Total workers	2992461 (49.23)	1686658 (54.62)	1305803 (43.67)
Main workers	1963882 (32.31)	1333361 (43.17)	630521 (21.09)
Marginal workers	1028579 (16.92)	353297 (11.44)	675282 (22.58)

Note: Figures in parentheses are percentages

Source: Primary Census Abstract of Himachal Pradesh

Table 2.7 Percentage of Main and Marginal Workers, 2001

Particulars	Persons	Male	Female
Hamirpur			
Main workers	58.36	69.45	47.82
Marginal workers	41.64	30.55	52.18
All	100.00	100.00	100
Himachal Pradesh			
Main workers	65.62	79.05	48.29
Marginal workers	34.38	20.95	51.71
All	100.00	100.00	100

Source: Primary Census Abstract of Himachal Pradesh

Table 2.8 represents occupational composition of main and marginal workers and it shows that the percentage of cultivators accounts for 57.29 per cent in Hamirpur and 55.46 per cent in Himachal Pradesh. Among cultivator the percentage of females was 88.42 and 80.93 in the district and state, respectively. Similar trend was observed in case of marginal workers. The table further reveals that the among other occupational categories, the share of agricultural labourers and household industry workers is less than 3.1 per cent in the district and less than 6 per cent in the state. The other work categories among main workers accounted for 40.34 of the total main workers in Hamirpur in which the share of male and female worker is 61.95 and 10.53 percent, respectively.

Table 2.8 Occupational Pattern of Main and Marginal Workers, 2001

Particulars	Hamirpur			Himachal Pradesh		
	Persons	Male	Female	Persons	Male	Female
I Main Workers	119870 (100.00)	69496 (100.00)	50374 (100.00)	1963882 (100.00)	1333361 (100.00)	630521 (100.00)
i. Cultivators	68675 (57.29)	24132 (34.72)	44543 (88.42)	1089124 (55.46)	578807 (43.40)	510317 (80.93)
ii. Agricultural labour	719 (0.60)	455 (0.65)	264 (0.52)	36156 (1.84)	26499 (1.99)	9657 (1.53)
iii. Household industry	2122 (1.77)	1859 (2.67)	263 (0.52)	34917 (1.74)	27671 (2.07)	7246 (1.15)
iv. Others	48354 (40.34)	43050 (61.95)	5304 (10.53)	803685 (40.92)	700384 (52.53)	103301 (16.38)
II Marginal Workers	85535 (100.00)	30571 (100.00)	54964 (100.00)	1028579 (100.00)	353297 (100.00)	675282 (100.00)
i. Cultivators	74860 (87.52)	22768 (74.48)	52092 (94.77)	865746 (84.16)	255505 (972.32)	610241 (90.36)
ii. Agricultural labour	2572 (3.01)	1318 (4.31)	1254 (2.28)	58015 (5.64)	29159 (8.25)	28856 (4.27)
iii. Household industry	794 (0.93)	388 (1.27)	406 (0.74)	17602 (2.03)	6363 (1.80)	11239 (1.66)
iv. Others	7309 (8.55)	6097 (19.94)	1212 (2.21)	87216 (8.48)	62270 (1.76)	24946 (3.69)

Note: Figures in parentheses are percentages

Source: Primary Census Abstract of Himachal Pradesh

2.4 Land Utilization, Cropping Pattern and Crop Production

The total geographical area of the district is 1,10,070 hectares and the changes in the land use for the period 1990-91 to 2004-05 have been depicted in Table 2.9. The table reveals that the area under forest accounts for 16.70 per cent of the total geographical area during 2004-05 which show gradual decline since 1990-91. The area under barren land, land put to non-agricultural uses, cultural wastes accounted for 13.34, 17.24, 8.98 and 4.36 per cent, respectively of the total geographical area of the district. The current fallow and other fallow lands was 5.26 and 1.91 per cent of the total geographical area, whereas the area under miscellaneous trees and groves was nil. The net area sown is of the major concern as far as development of agriculture in the district is concerned. The net sown area of the district was 36.48 per cent during 1990-91 which has gradually declined to 32.21 per cent during 2004-05. The land use pattern for the period of 1990-

91 to 2004-05 has not shown drastic pattern of change. However, in general, the area under land put to non-agricultural uses has shown an increasing trend. Almost similar trend has emerged at state level for different categories.

Table 2.9 Changes in Land Utilization Pattern (Per Cent)

Particulars	Year	Forest Land	Barren land	Non-agri. uses	Culture able waste	Pasture	Misc trees/groves	Current fallow	Other fallow	Net sown area
Hamirpur	1990-91	18.21	15.81	15.36	7.10	0.33	0.00	6.22	0.49	36.48
	1995-96	18.47	14.52	15.70	8.95	0.25	0.00	8.13	0.75	33.23
	2000-01	16.95	11.21	16.87	10.07	5.25	0.01	5.87	1.13	32.65
	2004-05	16.70	13.34	17.24	8.98	4.36	0.00	5.26	1.91	32.21
H.P.	1990-91	30.85	5.46	5.74	3.72	33.72	1.43	1.33	0.46	17.31
	1995-96	31.10	4.07	5.66	3.64	35.44	1.35	1.55	0.76	16.43
	2000-01	24.05	17.75	6.90	2.74	33.63	1.25	1.19	0.30	12.20
	2004-05	24.22	14.78	10.08	2.80	33.02	1.51	1.32	0.31	11.94

The changes in the cropping pattern of the district have been presented in Table 2.10. The table indicates that the total cropped area was 79.32 thousand hectares during 1990-91 which declined to 71.17 thousand hectares (1995-96), 68.94 thousand hectares (2000-2001) and 70.07 thousand hectares in 2004-05. It is interesting to note that from 1990-91 to 2000-01, the major proportion (about 99 per cent) of total cropped area was under food grain only. Among the different crops, wheat occupied maximum share of total cropped area followed by maize. The percentage of area under paddy, barley and pulses declined continuously in the district since 1991-91 to 2004-05. The table further indicates that during last five years i.e. 2000-01 to 2004-05 the area under total food grain crops has declined by almost 2 per cent. This indicates that this area might have been shifted to cash crops mainly off-season vegetables. At state level, the share of food grain crops to the total cropped area showed a gradual decline which was around 83.66 per cent during 2004-05 as compared to 88.59 per cent during 1990-91. This indicates that in the state about 5 per cent of the cropped area has been diversified towards cash crops mainly vegetables and millets.

Table 2.10 Changes in Cropping Pattern (Per Cent)

Particulars	Year	Maize	Rice	Wheat	Barley	Pulses	Food grains	Cropped area ('000' Ha)
Hamirpur	1990-91	48.30	4.45	44.76	0.25	1.39	99.35	79.32
	1995-96	45.68	4.09	47.92	0.31	0.85	98.88	71.17
	2000-01	44.73	3.49	50.41	0.15	0.20	99.01	68.94
	2004-05	45.27	3.45	48.01	0.11	0.10	96.95	70.07
H.P.	1990-91	32.44	8.63	38.26	2.98	3.69	88.59	983.60
	1995-96	32.58	8.74	38.04	2.84	3.8	87.43	949.89
	2000-01	31.46	8.65	38.27	2.71	3.28	85.98	947.54
	2005-06	30.98	8.32	37.59	2.65	2.88	83.66	953.60

Note: Percentages have been worked out on the basis of total cropped area in each district.
Source: Annual Season and Crop Reports, Directorate of Land Records, Government of Himachal Pradesh

The changes in production of different crops including total foodgrains have been presented in Table 2.11. The table shows that the production of foodgrains declined from 115.85 thousand tonnes in 1995-96 to 82.77 thousand tonnes in 2005-06, maximum decline was recorded in maize and wheat in the district. Similar trend was observed in the state also. The production of foodgrains in the state was 1336.26 thousand tonnes in 1995-96 which declined to 1079.15 thousand tonnes in 2005-06. In the district, rice production showed very slight decline in production which was 3.28 thousand tonnes in 1995-96 and declined to 3.23 thousand tonnes in 2005-06 while in the state it was 111.76 thousand tonnes in 1995-96 and declined to 112.14 thousand tonnes in 2005-06. The production of pulses decreased from 0.24 thousand tonnes in 1995-96 to 0.02 thousand tonnes in 2005-06 in Hamirpur district, but at state level the production of pulses nearly doubled during the period. The yields of main crops, including food grains, have been shown in Table 2.12. It can be seen from the table that the yield of major foodgrains has declined to varying degree between 1995-96 to 2005-06 both at district and state level. The pulse productivity in the district has declined drastically from 7.6 q/ha in 1995-96 to just 0.76 q/ha in 2005-06. However, in the state the yield of pulses has increased from 2.31 to 7.14 q/ha in the mentioned period.

Table 2.11 Trends in Production of Major Crops, 1990-91 to 2005-06 ('000' tonnes)

Particulars	Year	Maize	Rice	Wheat	Barley	Pulses	Foodgrains
Hamirpur	1990-91	NA	NA	NA	NA	NA	NA
	1995-96	65.84	3.28	46.15	0.34	0.24	115.85
	2000-01	72.84	3.59	53.84	0.15	0.05	130.47
	2005-06	51.44	3.23	28.04	0.023	0.02	82.77
H.P.	1990-91	669.20	945.32	543.69	3.71	10.87	1368.66
	1995-96	663.44	111.76	502.01	3.42	18.61	1336.29
	2000-01	683.64	124.98	251.32	21.41	20.46	1108.41
	2005-06	543.06	112.14	365.89	29.36	19.63	1079.15

Source: Annual Season and Crop Reports, Directorate of Land Records, Government of Himachal Pradesh

Table 2.12 Trends in Yields of Major Foodgrain Crops, 1990-91 to 2005-06 (Q/ha)

Particulars	Year	Maize	Rice	Wheat	Barley	Pulses	Foodgrains
Hamirpur	1990-91	NA	NA	NA	NA	NA	NA
	1995-96	20.3	11.3	13.5	14.5	7.6	13.14
	2000-01	22.5	14.2	15.7	13.9	6.6	14.58
	2005-06	18.0	14.9	13.0	10.3	0.76	11.39
H.P.	1990-91	18.76	9.87	15.99	14.70	2.31	16.54
	1995-96	19.90	13.46	13.89	12.69	5.16	16.09
	2000-01	22.94	15.24	7.21	8.33	6.58	14.59
	2005-06	18.39	14.13	10.21	11.64	7.14	13.52

Source: Annual Season and Crop Reports, Directorate of Land Records, Government of Himachal Pradesh

The data on area, production and yield of different vegetables and spices for the year 2005-06 has been presented in Table 2.13. The table reveals that of the total 1495 hectare area under vegetables and spices, capsicum and chillies occupied 210 hectare with a production of 6480 tonnes. Onion and garlic production was 2,700 tonnes with coverage of 165 ha area. The other important vegetables of district are cauliflower, cucurbits and bhindi grown on an area 360 hectare contributing 5560 tonnes towards production pool in the district. The table further reveals that the yield of major vegetables grown in the districts varied between 100 q/ha in case peas to 308.57 q/ha in case of capsicum and chillies whereas, in state, the yield varied between 104.6 q/ha (French beans) to 327.05 in case of tomato. It can be seen from the table that the productivity of capsicum & chillies, bean, bhindi, radish, turnip and carrot in district was higher as compared to the state. This indicates that there is scope for exploiting the available niches/irrigated land for the production of these vegetables in the district.

Table 2.13 Area, Production and Yield of Different Vegetables and Spices, 2005-06

Crops	Hamirpur			Himachal Pradesh		
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Area (Ha)	Production (Mt)	Yield (Q/ha)
Peas (Green)	90	900	100.00	15348	177036	115.35
Tomato	100	1796	179.60	9211	301249	327.05
French beans	100	1500	150.00	2674	27973	104.61
Onion & garlic	165	2700	163.64	3735	49622	132.86
Cabbage	70	1750	250.00	3677	115920	315.26
Cauliflower	120	1960	163.33	2263	53103	234.66
Radish, turnip & carrot	80	2000	250.00	1571	32675	207.99
Bhindi	120	1800	150.00	1728	19659	113.77
Cucurbits	120	1800	150.00	2082	43845	210.59
Capsicum & chillies	210	6480	308.57	2081	30876	148.37
Brinjal	70	910	130.00	772	14267	184.81
Other vegetables	250	8554	342.16	3715	63817	171.78
Ginger	-	-	-	2455	17051	69.45
Coriander (dry)	-	-	-	263	84	3.19
Chillies (dry)	-	-	-	837	87	1.04
Total	1495	32150	215.05	52412	947264	186.47

Source: Directorate of Land Records, Government of Himachal Pradesh, Shimla

Keeping in view the agro-ecological situation of the district, the fruits like mango, citrus, guava, peach and papaya etc; are grown by the farmers. Table 2.14 represents the area and production of fruits for period of 1990-91 to 2005-06. The table indicates that the area under fruits in the district has increased from 4,388 hectares during 1990-91 to 4,932 hectares during 2005-06. The production of all type of fruits has increased from 1103 to 5058 tonnes during the said period. The total fruit production was lowest i.e. 609 tonnes during 1995-96. The area and production of fruits also showed an increasing trend at state level. Fruits wise area and production of district Hamirpur has been presented in Table 2.15 & Table 2.16. It is clear from the table that in Hamirpur, among the different fruits grown, the area under citrus was highest 1,259 hectares which accounts for 25.53 per cent of the total area under fruits. The share of citrus in total fruit

production in the district was 17.69 per cent. At state level apple was important fruit crop accounting 46.20 per cent of the total area and 77.69 per cent of the total fruit production. The next major fruit crop of the state was citrus accounting for 4.19 per cent of production and covering 10.82 per cent of the total fruit area.

Table 2.14 Area and Production of Fruits; 1990-91 to 2005-06

Particulars	Year	Area (Ha)	Production (Mt)
Hamirpur	1990-91	4388	1103
	1995-96	5412	609
	1999-00	6200	2011
	2005-06	4932	5058
Himachal Pradesh	1990-91	163330	386314
	1995-96	195684	311889
	1999-00	217319	428049
	2005-06	191668	695520

Source: Directorate of Horticulture, Government of Himachal Pradesh, Shimla

Table 2.15 Area and Production of Different Fruits, 2005-06

Fruit Crops	Hamirpur		Himachal Pradesh	
	Area (Ha)	Production (Mt)	Area (Ha)	Production (Mt)
Apple	-	-	88560	540360
Citrus	1259	895	20729	29160
Dry Fruits	279	21	11210	3920
Other Fruits	3394	4142	71169	122080
Total Fruits	4932	5058	191668	695520

Source: Directorate of Horticulture, Government of Himachal Pradesh, Shimla

Table 2.16 Per Cent Area and Production of Different Fruits, 2005-06

Fruit Crops	Hamirpur		Himachal Pradesh	
	Area (Ha)	Production (Mt)	Area (Ha)	Production (Mt)
Apple	-	-	46.20	77.69
Citrus	25.53	17.69	10.82	4.19
Dry Fruits	5.66	0.42	5.85	0.56
Other Fruit	68.82	81.89	37.13	17.55
Total Fruits	100	100	100.00	100.00

Source: Directorate of Horticulture, Government of Himachal Pradesh, Shimla

2.5 Distribution of Land Holdings

Table 2.17 shows the changing distribution of landholdings in terms of proportion of different categories of holding and area accounted for by them. The table shows that the percentage of marginal holdings increased from nearly 55 per cent to 67.20 per cent from 1980-81 to 2000-01 while the corresponding area increased from 15.11 to 27.86 per cent.

Table 2.17 Changing Pattern of Land Holdings, 1980-81 to 2000-01 (Per Cent)

Particulars	Census Year	Marginal <1 Ha		Small 1-2 Ha		Medium 2-4 Ha		Large >4 Ha		Total (Ha)	
		No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
Hamirpur	1980-81	55.16	15.11	22.26	21.57	15.12	28.60	7.46	34.71	50686	73568
	1985-86	61.84	21.57	20.57	24.03	12.59	28.30	5.00	26.09	59886	73541
	1990-91	63.20	23.19	21.05	25.72	11.51	27.24	4.24	23.85	65851	76735
	1995-96	64.96	25.89	20.49	25.97	10.92	26.89	3.63	21.25	69193	76579
	2000-01	67.20	27.88	19.71	27.26	9.97	25.99	3.12	18.87	72877	74513
H. P.	1980-81	55.30	14.92	22.03	20.43	15.16	27.08	7.51	37.57	637081	980425
	1985-86	61.55	20.46	20.63	22.71	12.24	25.97	5.58	30.86	752882	980240
	1990-91	63.82	21.26	19.96	23.29	11.26	25.51	4.96	29.94	833793	1009766
	1995-96	62.85	23.05	19.61	24.07	10.74	25.54	6.80	27.34	884492	999099
	2000-01	67.30	25.70	19.10	25.00	9.80	24.80	3.80	24.50	913914	978756

Source: Agricultural Census, Directorate of Land Records, Government of Himachal Pradesh, Shimla

The proportion of small holdings, however, declined from 22.26 per cent in 1980-81 to 19.71 per cent in 2000-01 and the area under small holdings increased from 22 per cent in 1980-81 to 27 per cent in 2000-01. The number and area under medium and large holdings declined at district level. Almost similar pattern was evident for the state as well.

The changes in average size of holding has been presented in Table 2.18. The table shows that the average size of holdings of all size categories both at district and state level recorded a persistent decline from 1980-81 to 2000-01. The overall average size of holding was close to 1 ha both at district and state level.

Table 2.18 Changes in Average Size of Holdings, 1980-81 to 2000-01 (Hectares)

Particulars	Year	Marginal (<1 Ha)	Small (1-2 Ha)	Medium (2-4 Ha)	Large (> 4 Ha)	Overall (Ha)
Hamirpur	1980-81	0.40	1.41	2.75	6.75	1.45
	1985-86	0.43	1.43	2.76	6.40	1.23
	1990-91	0.43	1.42	2.76	6.55	1.17
	1995-96	0.44	1.40	2.73	6.48	1.11
	2000-01	0.42	1.41	2.66	6.21	1.02
H. P.	1980-81	0.42	1.43	2.75	7.70	1.54
	1985-86	0.43	1.43	2.76	7.20	1.30
	1990-91	0.40	1.41	2.74	7.31	1.21
	1995-96	0.41	1.39	2.69	7.03	1.13
	2000-01	0.41	1.40	2.71	6.85	1.07

Note: Medium includes semi-medium holdings also

Source: Agricultural Census, Directorate of Land Records, Government of Himachal Pradesh, Shimla

2.6 Input Use and Irrigation

In Himachal Pradesh, more than 80 per cent area is un-irrigated and major crops like maize, wheat and paddy are grown under rainfed conditions. Table 2.19 reveals that per cent irrigated

area to net sown area in district has increased to 5.30 per cent during 2005-06 as compared to 4.40 per cent during 1990-91. In case of crops, it is around 2 per cent in maize and about 5 per cent in wheat. During 1990-91, per cent irrigated area under paddy was 30.14 per cent which declined to 17.92 per cent during 1995-96 and increased again to 35.60 per cent during 2005-06. Table further revealed that per cent irrigated area to net sown area has slightly increased from 17 to 19 per cent in the state. Paddy crop occupied maximum per cent irrigated area to the net sown area in state showing an increase from 30.14 to 35.60 and 57.79 to 60.39 per cent, respectively from 1990-90 to 2002-03. Table 2.20 indicates area under high yielding varieties of major crops during 2006-07. Wheat crop covered 33.65 thousand hectare area under high yielding varieties followed by 30.50 thousand hectares under maize and 1.80 hectares under paddy in the district Hamirpur. Similar trend was observed at state level, maximum being under wheat (349.6 thousand hectares) followed by maize (280.61 thousand hectares) and paddy (72.65 thousand hectares). Use of fertilizers is considered as the king pin for increasing the productivity of different crops.

Table 2.19 Area under Irrigation in Major Crops (Per Cent)

Particulars	Year	Maize	Paddy	Wheat	% Irrigated area
Hamirpur	1990-91	2.08	30.14	4.55	4.40
	1995-96	1.81	17.92	4.23	4.55
	2000-01	2.24	35.58	4.31	4.62
	2005-06	2.44	35.60	4.89	5.30
H P	1990-91	6.78	57.79	17.31	17.00
	1995-96	7.77	60.41	18.90	18.79
	2000-01	8.28	63.21	18.46	19.13
	2002-03	9.43	60.39	20.33	18.80

Source: Annual Season and Crop Reports, Directorate of Land Records, Government of Himachal Pradesh, Shimla

Table 2.20 Area under High Yielding Varieties of Major Crops, 2006-07 ('000, Ha)

Source: Annual Season and Crop Reports, Directorate of Land Records, Government of H.P.

Crop	Hamirpur	Himachal Pradesh
Maize	30.50	280.61
Paddy	1.80	72.65
Wheat	33.65	349.60

Table 2.21 indicates that fertilizers consumption in the Hamirpur district has increased from 1,006 metric tonnes during 1980-81 (774 mt in Kharif and 232 mt in Rabi) to 2,854 mt during 2005-06 (1,898 mt in Kharif and 956 mt in Rabi). At state level also, there was an increase of about 244 per cent in fertilizer consumption from 1980-80 to 2005-06. In terms of fertilizer consumption per hectare, it increased from 14.06 kilogram per hectare in 1980-81 to 40.64 kilogram per hectare in 2005-06 in district and from 14.74 kilogram per hectare to 50.78 kilogram per hectare at state level.

Table 2.21 Fertilizer Consumption, 1980-81 to 2005-06

District/ State	Year	NPK (Metric Tonnes)			NPK (Kg/ha)		
		Kharif	Rabi	Total	Kharif	Rabi	Overall
Hamirpur	1980-81	774	232	1006	22.04	6.36	14.06
	1991-92	1808	662	2470	48.89	18.12	33.60
	1998-99	1617	810	2427	44.72	22.82	33.87
	2005-06	1898	956	2854	53.72	27.39	40.64
Himachal Pradesh	1980-81	8155	5795	13950	15.93	13.33	14.74
	1991-92	15599	15006	30605	29.12	34.36	31.47
	1998-99	15318	19534	34852	28.88	42.85	35.33
	2005-06	19197	28776	47973	37.28	66.69	50.78

Source: Statistical Outlines, Directorate of Economics and Statistics, Government of Himachal Pradesh, Shimla

Machinery is an important input of production of different crops as it helps in completion of different agricultural operations well in time and also saving energy and labour. The extent of use of different farm machineries in the district and state has been presented in Table 2.22.

Table 2.22 Extent of Mechanization (Number)

Type of implement	Hamirpur			Himachal Pradesh		
	1992	1997	2003	1992	1997	2003
Ploughs	57301	30983	32590	710349	462439	631470
Carts	NA	1	8	1128	1807	240
Cane crushers	243	150	124	1878	1213	1135
Tractors	115	196	356	3466	4205	6966
Oil engines	27	56	52	1299	1295	3664
Electric pumps	37	20	536	1222	2530	7325
Threshers	2031	1062	2081	19221	14048	19458

Source: Statistical Outlines, Directorate of Economics and Statistics, Government of Himachal Pradesh, Shimla

It can be seen from the table that the number of ploughs has decreased from 57,301 to 32,590 in district and 7, 10,349 to 6, 31,470 at state level during 1992 and 2003, respectively. However, the number of tractors has increased from 115 during 1992 to 356 during 2003 in district and from 3,466 during 1992 to 6,966 during 2003 at state level thereby indicating the increase in farm mechanization. There was a huge increase in number of electric pumps in the district from 37 in 1992 to 536 in 2003 and from 1,222 in 1992 to 19,458 in 2003 in the state. Likewise, the number of oil engines also increased both at district and state level. However, the number of cane crushers decreased both at district and state level. There was a slight increase in number of threshers from 2,031 during 1992 to 2,081 during 2003 in district and corresponding increase for the same period at state level was from 19,221 to 19,458.

2.7 Livestock and Fisheries

Farming practices and components of farming systems in hilly areas are usually mixed and integrated due to specificities of the areas. In these situations, livestock component of farming systems plays vital role in household economies both in term of employment and income generation. It fulfills household needs for milk, meat, and other milk products on one hand and

provides sustainability to the other farming components such as agriculture, horticulture through Farm Yard Manure (FYM), which is the most critical input for the crop enterprises. The activities of livestock component are of continuous nature and provide regular stream of returns round the year. Therefore, it is important to examine the changes in the livestock population and its composition.

The status of livestock component in district for the latest three censuses has been presented in Table 2.23. The table reveals that the total livestock population of the district has declined continuously from 2,59,640 in 1982 to 2,03,896 in 2003. On the other hand, it has shown a marginal increase at state level. In general, there was decline in the population of all categories of livestock except buffaloes in the district which has shown an increase of 30.10 per cent during 2003 as compared to 1982 animal census. Among different categories of livestock, the steepest decline has been observed in case of sheep whose population was less than 1/3rd during 2003 as compared to the population of 1982 census. At state level, the population of all categories of livestock showed an increasing trend except sheep. The table further reveals that there was tremendous increase in poultry population in the district as well as in Himachal Pradesh. This has recorded an increase of 62.07 and 131.77 per cent between 1982 and 2003 census.

Table 2.23 Changes in Livestock Population in District Hamirpur, 1982 to 2003

Particulars	Census year	Cattle	Buffalo	Sheep	Goats	Total livestock	Poultry
Hamirpur	1982	70447	80328	58877	39350	259640	25037
	1992	60810	94352	50027	30794	246273	29814
	2003	39040	104512	17911	29641	203896	40579
Himachal Pradesh	1982	2106229	560006	1055005	1035337	4795226	329561
	1992	2151616	700923	1074345	1115591	5116933	664039
	2003	2196538	773229	906027	1115587	5046044	763820

Source: Livestock Census 1982, 1992 and 2003

The production of milk, meat, eggs and wool from different categories of livestock has been presented in Table 2.24 for the period 1990-91 to 2006-07. The table clearly indicates that although the cattle population of the district has shown a decreasing trend, yet the milk production in the district has increased from 2.95 mt (1990-91) to 9.30 mt (2006-07). It is mainly due the rearing of improved/cross bred cattle by the farming community. The overall production of the milk in Hamirpur district increased from 51.57 thousand metric tonnes during 1990-91 to 77.37 thousand metric tonnes during 1995-96 which later decreased to 74.28 and 71.24 thousand metric tonnes during 2000-01 and 2006-07, respectively. The wool production increased both at district and state level. On the other hand, the total meat production from animal was 130.57 during 2006-07 showing a decrease of 42 per cent and 35 per cent over 2000-01 and 1990-91, respectively. The lowest meat production was recorded during 1995-96 which was around 98 metric tonnes. On the same pattern, the egg production in the district decreased from 22.73 lakh during 1990-91 to 17.50 lakh during 2006-07. This indicates that majority of the poultry was reared for meat purpose.

The status of fish production of the district as well as for the state has been presented in Table 2.25. It can be seen from the table that the number of registered fishermen in Himachal Pradesh

declined to 10,536 during 2006-07 from 12,109 during 1990-91. Contrary to this, the number of registered fishermen in the district Hamirpur increased from 271 to 360 during the same period. The fish production in the district increased by more than 300 per cent from 1990-91 to 2006-07.

The above discussion indicates that among milch animals, the buffaloes are the most preferred one. However, in spite of decreasing livestock population, the milk production has shown an increasing trend. Similarly, the population of sheep showed a declining trend but the total wool production registered an increase. This may be due to the adoption of improved breeds. In order to improve production and productivity of the livestock component, there is need to strengthen breed improvement programmes for both cattle and buffaloes through intensive research and development programmes. There is also need to lay due emphasis on poultry and fish farming to check the declining trend in the meat and egg production.

Table 2.24 Changes in Livestock Production, 1990-91 to 2006-07

Particulars	Milk ('000' Mt)				Wool (Mt)	Meat (mt)				Eggs (Lakh no.)
	Cow	Buffalo	Goat	Total		Goat	Sheep	Pig	Total	
Hamirpur										
1990-91	2.95	47.41	1.21	51.57	61.51	99.62	76.74	0.24	176.60	22.73
1995-96	4.11	71.47	1.79	77.37	53.54	59.55	38.543	-	98.095	31.23
2000-01	4.97	67.54	1.77	74.28	78.55	126.37	57.91	2.07	186.35	36.60
2006-07	9.30	60.84	0.98	71.24	80.90	80.9	46.20	1.30	130.57	17.50
Himachal Pradesh										
1990-91	257.563	300.843	14.199	572.605	1452.10	2332.00	1432.00	285.00	4049.00	531.70
1995-96	302.842	344.635	28.795	676.272	1548.13	2283.07	1159.39	150.82	3593.28	720.81
2000-01	349.620	377.032	33.759	760.411	1586.11	2248.61	955.19	221.61	3425.41	815.68
2006-07	500.005	345.186	27.204	872.014	1605.33	1869.60	799.85	264.77	2934.23	771.98

Source: Directorate of Animal Husbandry, Government of Himachal Pradesh, Shimla

Table 2.25 Trends in Fishery Production, 1990-91 to 2006-07

Particulars	Registered Fishermen	Production (Mt)
Hamirpur		
1990-91	271	142
1995-96	168	258
1999-00	275	384
2006-07	360	519
Himachal Pradesh		
1990-91	12109	5132
1995-96	8162	6002
1999-00	9698	6995
2006-07	10536	6886

Source: Summary Statistics for District Hamirpur 2006-07, District Statistical Office, Hamirpur

2.8 Infrastructural Facilities

The infra-structural Facilities of locality play a crucial role in the promotion and development of different enterprises for the social upliftment of rural masses. The important infra-structural facilities available in district have been presented in Table 2.26.

Table 2.26 Infrastructural Facilities in District Hamirpur, 2006-07

Sr. No.	Particular	Number
1.	Veterinary hospitals	17
2.	Veterinary dispensaries	119
3.	Artificial insemination centers	128
4.	Primary schools	509
5.	Middle schools	131
6.	High schools	85
7.	Senior secondary schools	111
8.	Colleges	6
9.	Hospitals	2
10.	Community/Primary health centers	29
11.	Civil dispensaries	1
12.	Health sub- centers	152
13.	Hospital beds	490
14.	Hospital beds per lakh of population	0.001
15.	Ayurvedic dispensaries	70
16.	Ayurvedic hospitals	3
17.	Homeopathic dispensaries	1
18.	Fair price shops	273
19.	Commercial banks	60
20.	Co-operative societies	347
21.	Himachal <i>gramin</i> banks	2
22.	Motorable roads (Km)	1680
23.	Post office	225

Source: Summary Statistics for District Hamirpur 2006-07, District Statistical Office, Hamirpur

2.9 Potential and Constraints

The above deliberations indicated that district Hamirpur receives a good quantum of annual rainfall i.e. more than 1,000 mm. There are two seasons of rainfall during the year, one from December to March, associated with the passage of western disturbances and the other which is the main one extending from middle of June till middle of September caused by the south west monsoon. The major portion of rainfall i.e more than 70 per cent is received during July to September. So there exists tremendous scope of rain water harvesting through construction of check dams on small seasonal tributaries and tanks on suitable places for providing the life saving irrigations to the high value crops.

The cropping pattern of the district is dominated by the food grain crops, mainly, maize and wheat which are not so remunerative. As such there is tremendous scope for diversifying the existing cropping pattern through the introduction of vegetables and other high value cash crops under irrigated conditions. The potential of these activities can further be enhanced by undertaking these activities during the rainy season or by harvesting the rain water potential through different measures. The cultivation of vegetables like cucurbits and solanaceous crops during kharif season under rainfed situations has been taken up by a few innovative farmers and has proved highly profitable. The vegetables produced under rainfed situations in the kharif are fetching remunerative prices as these are treated as off-season produce for the distant markets.

Dairy farming is also one of the promising farm avocations as it provides round the year income and employment besides contributing significantly towards sustainability to the crop sector. Among milch animals, buffalo is the most preferred milch animal due to taste preference for buffalo milk and more adaptability.

There are about 1,000 Women Self Help Groups and good number of unemployed rural youth in the district. The agro-climatic conditions are favourable for the production of following enterprises which provide livelihood to rural women and un-employed rural youth:

- Mushroom Production
- Bee keeping
- Protected cultivation of high value crops
- Poultry production enterprises
- Cultivation of medicinal plants
- Post harvest management and value addition activities
- Sericulture

There are various constraints that hinder the growth and progress of agriculture and allied activities. The pertinent constraints are enlisted as under:

- Frequent occurrence of droughts in rabi and summer seasons as well as periodic acute frost injury to major fruits like mango and subtropical fruits
- Scattered niche crops and poor marketing infrastructure
- Infestation of forests and pastures with obnoxious weeds leading to fodder scarcity
- Loose and shallow soil strata more vulnerable to soil erosion
- Scanty irrigation facilities thwarting diversification with high value commercial crops
- Poor management of traditional water bodies and minimal efforts for rain water harvesting and conservation
- Reduction in livestock particularly bullocks leading to reduced supply of organic manure

In order to harness the potential available in the district, these constraints need to be tackled on priority in a planned manner. The district agricultural plan under consideration has been prepared in consonance with the above mentioned potential and constraints

Chapter-III

SWOT ANALYSIS OF THE DISTRICT

SWOT (Strength, Weakness, Opportunities and Threats) analysis is an ideal tool for taking rational decisions about an enterprise under given set of situations. The decisions regarding the selection of agricultural enterprises, use of production technology and post-harvest management are complex and risky. The risk and uncertainty can be minimized if strengths, weaknesses, opportunities and threats of an enterprise/activity are analysed properly and carefully prior to the execution. This section deals with the SWOT analysis with respect to the existing agricultural enterprises as well as the new/potential enterprises of the district.

3.1 SWOT Analysis for Improving Agriculture and Allied Sectors

3.1.1 Strengths

Natural Resources

- District receives a good quantum of annual rainfall i.e. 1,000-1,500 mm.
- The topography of district is moderately hilly and undulating which makes the soil of the district well drained
- Soil conservation and rain water harvesting activities have been undertaken by the Department of Agriculture and District Rural Development Agency in which about 300 water harvesting structures have been constructed which can be used for irrigation for growing cash crops or providing the life saving irrigation to different crops.
- Climatic conditions of the district are relatively moderate which offer good scope of rearing wide range of livestock and poultry species.
- About 35 per cent of the total geographical area is under pastures/grass lands/waste land etc. which can be improved through introduction of improved grasses and multiple tree species. This will provide support to livestock component and wild life.
- The forest areas, common lands, river beds and neglected pieces of private lands are full of obnoxious weeds which can be utilized for the production of vermi-compost by the farmers.

Agriculture

- Land use system of the district indicates ample scope for diversification.
- The agro-climatic situations are suitable for the cultivation of cereals, pulses, oilseeds and number of vegetable crops as well as fruit crops like citrus, mango, guava and papaya. Vegetables like tomato, cucurbits, brinjal, chillies and capsicum etc. can also be grown successfully during kharif under rainfed situations.
- More than 95 per cent of the total cropped area is occupied by cereals in which the use of plant protection chemicals like herbicides, insecticides/pesticides is limited, thus, offering great potential for promoting organic farming.

- In case of wheat, almost 100 per cent farmers have adopted improved varieties, whereas, about 50 per cent of the farmers are using the seeds of hybrids in case of maize.
- Farm yard manure is being used in case of maize cultivation.
- Scientific weed management practices in maize, paddy and wheat are being followed by about 40 per cent of the farmers
- Although broadcasting is the major method of seed sowing in case of maize and wheat yet about 30 per cent farmers use *kerā* (broadcasting method).
- Traditional water bodies such as *khatris* are available in most of the households in some parts of Sujapur, Tauni Devi, Bhoranj and Hamirpur developmental blocks. These water harvesting structures can be used for irrigation or providing life saving irrigation to cash crops.

Horticulture

- The mushroom growing activities can be undertaken throughout the year due to availability of raw material and high demand in the market
- District has wide range of local germplasm of fruits like mango, citrus which can be used for the production of variety of value added products.
- The medicinal plants such as *herd*, *bhera* and *amla* can also be grown successfully on marginal and sub-marginal lands.
- District has the state's best road connectivity to the rural areas for marketing of fruits.
- District has about 300 water harvesting structures which can support plantation of fruits in adjoining areas.

Animal Husbandry

- Among the milch animals, about 60 per cent cattle are crossbred and about 30 per cent of buffaloes are of improved breeds.
- Sufficient green grasses and tree litter are available for 6-7 months in a year. Crop residues, weeds and fodder crops supply the dry/green fodder for rest of the year.
- Improved sticks of grasses and nursery of fodder trees are available with many departments like SAUs/KVK/Farmers for improvement of grass lands and pastures.
- The climatic conditions are suitable for rearing of cows and buffaloes successfully.
- Veterinary clinical services are available within 10 km distance in the district.
- Markets for milk and milk products are available in the local areas. The procurement of milk from rural areas is also being done by the milk federation.
- Intensive Dairy Development Project is in operation in the district for breed improvement, dissemination of better management practices and commercialization of the activities.
- Credit facilities are available in the district under different departmental and credit institutional schemes.

- Good scope of poultry enterprise especially broiler as the population of small ruminants (sheep & goat) is low in the district. Moreover, maize is the major crop of the district and the same is the chief ingredient of poultry feed.
- Good coverage of artificial insemination programme in the district for breed improvement.
- Disease resistance of non-descript cattle and other livestock, rich biodiversity both in domestic and wild animals provide inherent strength to the district to develop integrated crop livestock production systems particularly of sheep and goats based farming.

Others

- The literacy level in the district is higher as compared to other parts of the state helping in the general awareness and acceptability of the improved technologies responsive.
- Retired military personnel and educated un-employed youth having entrepreneurial ability are available.
- Fertilizer sale outlets are available near the villages.
- About 300 water harvesting structures can be utilized for fishery activities.

3.1.2 Weaknesses

Natural Resources

- The annual rainfall is not evenly distributed. About 70 per cent of total rainfall is received during rainy season (June-September).
- The soils are generally shallow with poor water holding capacity. The soils in the development blocks of Tauni Devi, Bhoranj, parts of Hamirpur and Bihari blocks are gravelly.
- The sloppy landscape causes quick run-off of rain water due to which ground water recharging is limited. Soils are susceptible to erosion, as a result, the fertile layer of soil run away with water
- Poor management of natural resources by the departments and beneficiaries.
- Scanty/poor vegetative cover on the forest/common lands.

Agriculture

- Farmers use higher seed rate as compared to the recommendation of the CSK HPKV which results into higher plant density. This leads to competition for nutrients, thus, affecting the overall growth and productivity.
- More than 90 per cent of the farmers follow broadcasting method of sowing in case of wheat, pulses and oilseeds and more than 50 per cent in case of maize. This leads to improper distribution of seed and placement of seed in the soil at varying depths leading to poor germination and low yields.

- Lack of awareness among the farmers about the scientific weed management in different crops. Farmers do not have full knowledge of crop specific herbicides, time of application and recommended doses of different herbicides.
- Lack of knowledge about the management of insect pest and diseases of different field crops. The losses due to insect pest and diseases are more in vegetable crops.
- More than 95 per cent of net area sown is rain fed.
- The average size of land holding is small (0.6 ha) and scattered.
- Erratic rainfall leading to moisture stress during different stages of crop growth in summer and winter months
- Method of preparation and application of FYM is unscientific. The available bio-mass in form of obnoxious weeds and crop wastes are burnt rather than used for composting. A few farmers still use animals dung as fuel.
- Imbalanced use of plant nutrients i.e. Nitrogen, Phosphorus and Potassium (NPK) is skewed towards Nitrogen (N). Majority of the farmers are not using the basal dose of NPK.
- The fields are small which restrict the proper use of mechanized farm implements.
- Non-availability of basic farm equipments and tools like spray pumps and manually operated line sowing tools etc. with farming community. However, these equipments and tools are available with the state department of agriculture on subsidized rates.
- Weak extension and back-up support system as a result of which farmers are handicapped in adopting improved technologies.

Horticulture

- Farmers ignore the proper layouts as per specific requirements of crops due to small size of individual farmer's holding.
- The pit size is not as per the recommendations i.e. 1x1x1 meter. Time of pit digging and its filling is not as per scientific recommendations.
- Lack of grafting, training and pruning skills of different fruits plants among the farming community.
- The fruit plants are generally planted on the field bunds for which proper basins are not prepared and maintained. The fields are terraced due to which the root distribution of the plants is not uniform.
- Lack of awareness about the proper application schedules of fertilizers and other nutrients among the farmers.
- Lack of knowledge about the insect, pest and disease management in fruit crops.
- Lack of knowledge about the grading and proper packing of fruits.

Animal Husbandry

- Non availability of green fodder throughout the year. Lack of nutritious and high yielding varieties of fodders.
- Preference of natural service with local bulls in case of buffaloes as success rate of artificial insemination is low.
- A large proportion of cattle and buffaloes in the district are non-descriptive and low yielders.
- Although the maintenance and per unit milk production cost is lower in case of cattle yet farmers prefer rearing buffaloes over cows.
- Farmers use local/indigenous wisdom for cure of diseases rather than seeking proper clinical diagnosis and treatment.
- Traditional/unscientific method of feeding (low adoption of chaffing) and management of livestock. There is a general lack of awareness among the farmers about the feeding of mineral mixture and other supplements.
- Non-adoption of deworming and vaccination schedule.
- The huge livestock population coupled with unscientific rearing practices are posing a serious threat to the sustainability of integrated crop livestock production systems in the district.
- Lack of awareness about the scientific storage/preservation methods of green fodder and storage for lean periods.
- Inability/unwillingness of farmers to transport their diseased animals to hospital/dispensary due to hilly tract in some parts of the district.

Others

- Migration of rural youth to urban areas and preference to jobs other than agriculture
- Low level of marketable surplus of cereals, vegetables, milk, egg and seasonal fruits with farmers which influences the marketing efficiency.
- Market facility are not adequate and properly administered due to lack of staff.

3.1.3 Opportunities

Natural Resources

- Area is suitable for planting improved grasses, fodder and timber trees
- Availability of drought tolerant wild fruit species like *aonla*, wild *ber* and wild pear etc.
- Soils are suitable for raising *khair*, *aonla*, bamboo, bael, fig and soap nut etc.
- Plenty of scope for rain water harvesting during rainy season which can be used as life saving irrigation for plantation and high value cash crops.

- Broad leaved fodder/timber trees plantation can replace the pine trees to augment fodder supply and reduce fire hazards

Agriculture

- Diversification is possible in the *Kharif* season (rainy season) with introduction of vegetables like tomato, okra, brinjal, cucurbits capsicum/chillies under rainfed situations.
- Diversification towards cash crops is also possible through the utilization of created irrigation potential and rain water harvesting sites.
- The seeds of improved varieties as well as hybrids in case of wheat, maize, oilseeds, pulses and vegetables are available which can be made available to the farmers.
- Recommendations available for the control of major insect, pest and diseases.
- Intensive crop production is possible in lower portions of the district

Horticulture

- The local germplasm of mango, citrus, *amla*, *harar* and other fruits can be multiplied and upgraded for more productivity.
- The climatic conditions of district are congenial for the production of mushroom throughout the year under natural climatic conditions i.e. button mushroom during winters and dhingri and milky mushroom during summer.
- District has relatively mild climate suitable for plantation of variety of fruit and medicinal plants e.g. mango, citrus, guava, *harar*, *aonla*, *bhera* etc.
- The maturity time of fruit crops in the district is different from that of plains which may provide opportunity to get attractive prices in the major markets of the country.

Animal Husbandry

- Huge demand of milk, meat and eggs in local and distant markets.
- Incentives for establishment of dairy, poultry and fishery units are available.
- The abundant availability of green fodder in kharif/rainy season can be utilized to address scarcity of green fodder experienced during winter and summer months through scientific preservation such as silage and hay making.
- Scope for improving pastures through planting of quality grasses and fodder plants.
- Good germplasm of sheep at sheep breeding farm, Tal, exists in the district/country.

Others

- New schemes like promotion of export of high value crops and multiplication of HYV seed through seed village concept through different incentives are being implemented by central/state governments for upliftment of farmers.
- The water harvesting structure constructed by the department of agriculture can be used for providing irrigation and fish production activities

- Selective herbicides are available and recommended for the control of weeds in arable and non-arable lands.
- Scope of organic farming of cereals and pulses.
- Setting up of agro processing units (fruit and vegetable processing and canning units) for value addition.

3.1.4 Threats

- Due to the hilly and sloppy topography and high intensity rains and lack of proper soil and water conservation measures at individual and community level, a sizeable amount of fertile soils is eroding from the forests and arable lands every year which is causing degradation of land resources. This is being further aggravated through different developmental activities. This will cause a serious concern for sustainability of production potential of land.
- Occurrence of severe frost at every 4-5 years interval causing damage to fruits like mango, papaya, banana
- Infestation of forest areas and other common land resources with obnoxious weeds (*Lantana*, *Parthenium* and *Ageratum*) which are acting as seed banks for infecting the adjoining areas (culturable lands, pastures, road sides, river banks etc.)
- Poor management of forest and common lands poses environmental threats for inhabited flora and fauna.
- Un-scientific use of inorganic fertilizers and plant protection materials adversely affecting the human as well as soil health which may lead to loss of bio-diversity.
- Preference for natural service with inferior/local bulls may result in inferior off-springs or cause genetic inbreeding, which may reduce milk production in the future.
- With the popularization of improved varieties/hybrids the precious local germplasm of different crops is at the verge of extinction (maize, paddy, wheat, pulses, and oilseeds) which will adversely hamper the future varietal developmental programmes.
- Development of resistance in pathogens and insect-pests against commonly used insecticides/fungicides e.g. in cucumber wilt and viral diseases; fruit fly, fruit borers, hadda beetle, blister beetle, white fly, etc. pose great danger to yield stability of existing improved varieties.
- Excessive mining in the district is leading to deepening of river/*Khads* and lowering the ground water table. This may lead to the drying up of natural water bodies.
- Increasing cases of infertility in cattle causing stray animal menace

3.2 Issues Emerging out of SWOT Analysis

- Preference of white collar jobs among educated rural youth.
- The productivity of existing crops and livestock need to be improved.

- Need for strengthening the soil and water conservation activities at farmers as well as public level.
- Improper and non-judicious use of irrigation with respect to water use efficiency and crop selection.
- Improvement of local germ-plasm of maize to make it resistant to lodging.
- Low investment in agriculture sector despite availability of huge subsidies in critical inputs and implements by the government.
- Improper spacing, pit size, fertilization in fruit plantations.
- Motivation of un-employed educated rural youth to adopt high income generating agricultural enterprises (mushroom, vegetable, poultry, processing and value addition) to check their migration to urban areas.
- Non availability of disease resistant varieties of bottle gourd, brinjal and other cucurbits.
- Eradication of obnoxious weeds such as *Ageratum*, *Parthenium* and *Lantana* on arable and non-arable lands.
- Lack of awareness of the latest agricultural technology.
- Development of improved varieties of fodders for pastures and field crops like berseem, sorghum, oats etc. suitable to Hamirpur conditions.
- Prevalence of malpractices by traders in marketing of produce.
- Preference for rearing of buffaloes over cattle due to taste factor.
- Low yield of livestock due to non-availability of green fodder round the year and imbalanced feeding of concentrates and other minerals.
- Prevalence of infertility and mastitis in livestock due to poor hygiene and housing.
- Preference of natural service by local bull over artificial insemination.
- High calf mortality due to poor management and feeding/deworming

3.3 Sectoral Growth Drivers

The existing agricultural scenario of the district is subsistence in nature but has great potential in different enterprises through the exploitation of niches. The area from the traditional crops i.e. maize and wheat may be diversified towards vegetable production to fulfil the growing demand in local and distant markets. The improvement/ diversification in livestock component by replacing local buffaloes with improved cattle coupled with scientific management/feeding practices will increase the milk production in the district for local consumption and surplus may be available for value addition purposes. Being major maize producing area, promotion of poultry farming and baby corn production may also prove as good growth drivers. The area is suitable for the production of fruits like citrus species, mango, guava, papaya and pome-granate etc. of which plantation can be promoted through the latest technology. In addition to this, there is scope for promoting the protected cultivation of high value crops (flowers/vegetables) round

the year. Mushroom production, processing and value addition enterprises are also the key factors for increasing the household income and providing self-employment to rural youth.

Exploitation of the existing irrigation potential, soil/rain water harvesting, improving the water utilization efficiency and filling the production gaps in different crop/livestock activities will increase the overall productivity/income of the sector in a phased manner. The district is well connected with the local /distant markets through link roads/state/national highways network for the disposal of fruits and vegetables. In the district, various development projects are in progress in which thousands of migratory labour class are involved and the demand for cereals, vegetables and fruits, milk and meat etc; is increasing. Therefore, available infra-structural facilities in the form of roads, processing units, extension network, research and extension institutes and credit facilities are the major growth drivers for the development of agriculture sector.

Chapter-IV

AGRICULTURAL DEVELOPMENT OF THE DISTRICT

Agriculture sector of the economy plays a crucial role in the socio-economic parameters of the society in general and the hilly region in particular. The current agricultural scenario is the resultant of number of changes which have taken place over the years with respect to human preferences, adoption of new agricultural technology, diversification of farming systems in the light of government policies and market forces. The pace of agricultural development depends on a number of factors such as extent of exploration of natural resources (land, water and environmental conditions), innovativeness of the farming community and availability of infra-structural facilities. The availability of these resources including infrastructural aspects along with the temporal changes and present status of agricultural development in terms of cropping pattern, crop production, crop yields, input use, and so on have been discussed using published data in chapter-II. 'What is and what ought to be' needs vision at micro and macro levels. On ground 'what is existing' is the resultant of endogenous (strengths and weaknesses) and exogenous (threats and opportunities) factors operating in particular situation and point of time. Strengths, weaknesses, opportunities and threats (SWOT) analysis for the different components i.e. natural resources, agriculture, horticulture and animal husbandry has been presented in chapter III, as emerged from wisdom and understanding of survey teams, interaction with respondents comprising of farmers, extension workers/scientists of line departments working in district, etc. The present chapter, based upon the data collected from all blocks and sample panchayats, describes some of the important aspects of agricultural development of the district such as land utilization pattern, cropping pattern, input gap, yield gap, varietal and technological problems, interventions required to solve these problems and researchable issues.

4.1 Land Use Pattern

Land use classification of an area indicates the present status of its utilization for different purposes under public and private ownership arrangement. Over the years, the land utilization pattern shows a gradual change in its utilization in the light of government policies as well as changing perspectives of the human population. The block-wise land use pattern of district Hamirpur has been analyzed and is presented in Table 4.1. The total geographical area of the district is 10,008 hectares. Block wise distribution of the area shows that among different blocks of the district, Bijhari is the biggest block which accounts for 26 per cent of total geographical area of the district. Hamirpur is the smallest block accounting for 6 per cent of total geographical area of the district. Table also reveals that among different categories of land use, about 34 per cent of total geographical area of the district is being used for cultivation of crops which is found to be the highest (64. per cent) in Bhoranj block followed by Hamirpur (50 per cent). The area under forest cover is around 17 per cent of the total geographical area. It accounts for 30 and 23 per cent in Bijhari and Nadaun blocks, respectively. Among different blocks, the area under forest is lowest in Tauni Devi block accounting for only 6 per cent of the total geographical area of the block. The area under supporting lands such as barren and uncultivable land, permanent pastures and grazing lands at district level accounts for 14 and 11 per cent respectively, of the total geographical area to the district whereas the cultural wastes and fallow land jointly accounts for 12 per cent. Among the blocks the percentage of permanent pastures to the total

geographical area is higher in Sujapur (20.66 per cent) followed by Tauni Devi (18.78 per cent). The cultural wastes and fallow land is higher in Hamirpur block as compared to other blocks of the district, which needs to be improved through the management of obnoxious weeds and introduction of improved grasses. During the survey, it is revealed by the respondents that this area is neglected due to the monkey menace and infestation by obnoxious weeds. The area can be brought under cultivation by way of eradication of obnoxious weeds and management of stray and wild animals. The table further indicates that the area under different categories of land use is degraded (more than 35 per cent) in case of forest and permanent pastures. Barren and uncultivable lands are rocky, stony and sloppy which require engineering interventions for the improvement.

An attempt has been made to identify the general problems of different land use categories of different blocks and percentage of panchayats facing these problems have been presented in Table 4.2. The percentage of panchayats having different problems such as hilly terrain, infestation of land with bushes and obnoxious weeds, rocks and boulder, wild animal and stray cattle menace, lack of technical knowledge etc; varies between 50 to 100 per cent in different blocks. The table indicates that the problem of stray and wild animals was reported by 53.57 per cent and 67.87 per cent panchayats of the district, respectively, which pose the major threats for the agricultural and other cash crops. In order to improve the different classes of lands in different blocks, there is need for scientific/land improvement interventions on various issues as observed during the survey and interaction with farmers. Table 4.3 presents the interventions needed to solve the problems of different land categories as identified in Table 4.2. Plantation of improved tree/fruit/grass species, eradication of weeds, export of monkeys and fencing etc. are proposed as the major intervention for the improvement of forest land, culturable wastes and permanent pastures and grazing lands. In order to overcome the problems of barren and uncultivable land, leveling, contour bunding and irrigation facilities were proposed by 75 per cent, 50 per cent and 57 per cent panchayats of the district, respectively. The estimates of area which require situation based interventions in terms of leveling, contour bunding, fencing and check dams were made for different blocks of the district and have been indicated in Table 4.4. The table shows that for the district as a whole 7789 hectares of land need leveling and 16,724 hectares contour bunding and terracing. The total amount of funds required for land improvement in the district was estimated at Rs 1,282 lakh (Table 4.5).

4.2 Soil and Soil Health

Soil is vital natural resource and its proper use and management sustains the life-supporting system and socio-economic development of any country. As per the recent soil survey by NBSS & LUP (1997), more than 75 per cent of the geographical area of the state is suffering from one or other soil degradation problem. The major degradation problem observed is water erosion including topsoil loss and terrain deformation, flooding and acidity. Therefore, major challenge is to reduce these problems up to the tolerance limits for the sustainable agricultural development of the state. This calls for scientific land use planning on watershed basis and its proper implementation with the active involvement of stake holders. There is a need to select watersheds representing each of the agro-ecological situations of the state and develop these as models, which will act as wheels of agro-technology transfer for the development of the

adjoining areas. An effort has been made to compile the soil survey information available from different sources for its best use for the preparation of soil profile for the district.

Physiographically, district can be divided into two tracts i.e. rainfed hilly tract and rainfed irrigated valley tract. The rainfed hilly tract is characterized by hill ranges, intermingled with rivers (*Khads*), rivulets and streams. Numerous small barren hills, hillocks and rocks are scattered all over the area. Cultivation is done usually in small terraces across the slopes. The width of the terraces varies between 2 to 5 meters and slope within the terraces is 1 to 3 per cent. The elevation of this tract varies between 650-1100 meters above mean sea level. Due to the irregular, undulating topography, shallow depth, steep slopes, poor soil structure, scanty vegetative cover and erratic rainfall, the soils are subjected to soil erosion during rainy season. During the summers, the area dries up and crops experience the condition of drought and crop yields are low. On the other hand, the topography of rainfed and irrigated valley tract is slightly slopping to plain with some areas having rolling land shape. Most of the area of this tract lies along the rivers and rivulets, surrounded partially and completely by hill ranges.

The majority of soils of the rainfed hilly tract fall under the entisol and inceptisol orders which are shallow to moderately deep with incipient profile developments. Texture varies from loamy sand to sandy loam having stony surface. Soil reaction is neutral (6.5-7.0 pH). Available N and P are low and K is medium. Water holding capacity is low and soils are susceptible to excessive soil erosion and land slides.

Soils of rainfed and irrigated valley tract, by and large, fall under the entisols, inceptisol and Alfisols orders. These soils show incipient to moderate profile development. Soil texture varies between loamy sand to clay loam. Soil reaction is mostly neutral and rarely acidic. N and P are low to medium and K is medium. Soil depth is shallow to moderately deep with low water holding capacity.

4.3 Water Resources and Management

Water is scarce resource and is extremely important for sustaining the life and growth of economy in all spheres. Therefore, there is need for proper use of water and its exploitation on sustainable basis. As far as the water resources are concerned, district Hamirpur is considered as the driest district of the state. The water situation in the district in terms of surface and underground water is discussed below.

Beas: It is one of the major rivers of the state/district which pass across the district, but touches the boundaries of the district in development block of Sujampur and Nadaun. A number of drinking water schemes including a few irrigation projects have been operationalized from this river.

Kunah Khad: Kunah is the main khad having its origin in the district itself. It starts from the Awahdevi area of Tauni Devi block and runs across Hamipur and Nadaun blocks of the district and joins the river Beas. Many small perennial as well as seasonal tributaries are the major sources of water to Kunah khad. There is sufficient water in the khad and many drinking water schemes are in operation.

Bakar Khad: This Khad originates from Tauni Devi block and mingles with Beas covering a distance of about 20 kilometers. It is seasonal tributary and generally dries up during the summer months. The gradient of the khad is sloppy as compared to the arable lands. The scope of gravity irrigation schemes from this khad are limited.

Man Khad: It originates from Barsar area of development block Bijhari and has total length of about 40 kms till it mingles with river Beas. It receives the water from number of tributaries. Many drinking water and irrigation schemes have been established on this khad for the benefit of the society. The slope of the khad is gentle and passes through the inhabited areas.

Sukar Khad It originates from the Salauni area of the district situated in development block Bijhari. It has two strings one extends towards Bilaspur and joins Sutlej and second one runs towards Hamirpur and Nadaun area and falls into Kunah khad and ultimately joins river Beas. It is generally a seasonal tributary having a few perennial feeding *chous* (*Nallas*). Its total length is about 15 km towards Hamirpur and towards other side it enters into Bilaspur after a distance of 25 km.

Other Khads: Seer, Pung, Jaglehr, Chaintha, Sanehl, Hathly, Gasoti, Jamli, Bumbloo etc. are other *khads* which are found in different parts of the district. All these *khads* after covering a distance of 10-15 km joins one of the above mentioned major *khads* of the district.

It is evident from the above discussion that there are large number of small tributaries in the district most of which are feeding sources for the major khads of the district. Since the breadth of the major khads like Kunah, Man, Sukar and Mundkhar etc; is quite large, it is difficult to construct check dams for water harvesting. But on the other hand, the small tributaries which are feeding source of above mentioned *khads* are generally narrow gullies which needs to be plugged for water storage and harvesting under watershed schemes.

Lakes, Tanks, Springs and Spring Heads

There is no potential natural lake in the district but there are large number of small ponds locally called as *tals*, among them, the biggest and famous is located in the development block Bhoranj and village is known after it as TAL. The water is used by people for livestock and washing of clothes. Most of the other small ponds which used to be earlier maintained for the storage of water for summer months to fulfill the requirement of livestock are defunct due to poor management. In addition to this, there are large number of *Khatris* in development blocks of Tauni Devi, Sujanpur, Bhoranj and Hamirpur. *Khatris* are the traditional water harvesting structure dugged in to the hard conglomerates to store water during rainy season which is to be used for different domestic purposes during summer months. Small springs are prevalent in different blocks of the district which serve as sources of water for the tributaries in the district.

Ground Water Resources

The exact quantum of utilisable ground water resources and stage of ground water resources in the district has not yet been estimated. The map of the ground water resources in district given below, however, shows soft rock aquifers where tube well and dug well are feasible and hard

rock aquifers where bore well, dug well and spring development are possible. The information provided in the legend, however, shows that regional geology is characterised by alluvium, siwaliks and metamorphic rocks. Ground water quality is assessed to be good and check dams, check dam cum ground water dam and recharge shaft have reported to be suitable recharge structures. Further, the data provided in the accompanying legend to the ground water resources map also reveals the depth, feasibility of bore well and dug well in the soft rock aquifers which varies between 50-100 meters and 10-20 meters with discharge of 1,200-2,500 litres per minute in case of the former type of wells and 300-500 litres per minute in respect of the latter. Likewise, in hard rock aquifers, the depth of bore well, dug well has been estimated between 100 to 200 metres and 10 to 20 meters, respectively.

4.4 Cropping Systems and Cropping Pattern

The major cropping systems followed in district Hamirpur are presented in Table 4.6. The table reveals that maize-wheat, paddy-wheat, maize-toria-wheat, maize-sarson, paddy-berseem, chari-berseem and mash-gram are the major crop rotations being followed in different blocks. The vegetable based crop rotations are tomato-cauliflower, summer squash-tomato-cauliflower, capsicum-brinjal-cauliflower, okra-radish-cauliflower and cucurbits-cole crop rotations are being practised by the farmers in district under irrigated and rainfed situations. The block wise cropping pattern of the district has been presented in Table 4.7. The table reveals that among different crops, wheat was the major crop of district which occupies about 46 per cent of the total cropped area of the district. Its share in total cropped area was found the highest (50 per cent) in Bijhari and the lowest in Sujanpur (44.47 per cent). Maize was the next important crop of the district accounting for 43.46 per cent of the cropped area. It occupied the area highest in Sujanpur and lowest in Bhoranj block (37.01 per cent). Table further indicates that the total area under vegetables in the district accounted for 3.79 per cent of the total cropped area while it was estimated at 5.43 per cent in Nadaun block and 4.38 per cent in Sujanpur block. Okra, tomato cauliflower and cucurbits were the major vegetable crops grown in district Hamirpur. The total area under fruit crops in the district was around 5,707 hectares (Table 5.2). Mango, citrus, guava aonla are the major fruit crops of the district. Among different crops, the area under mango was the highest i.e 2730 hectares which accounted for about 48 per cent of the total area under fruit crops. Since the plantations have been done mostly in the cultivated land i.e. on the fields bunds, the area has not been included in the cropped area separately.

4.5 Input Use and Gaps

The average size of holding is continuously shrinking due to the increase in population and fragmentation of holdings. As a result the majority of the holdings in the district falls under the small and marginal farm categories. Therefore, in order to fulfill the diversified needs of the farm families, limited available land resources are being used intensively for the production of foodgrains, fruit and vegetables etc. Under these circumstances, the production of different enterprises can be sustained through the judicious use of critical inputs such as seeds, fertilizers and plant protection materials etc. The potential yields may be achieved by ensuring timely availability of inputs and their judicious use at appropriate stages. The actual use of these inputs, their requirements and gaps for different crops have been worked out for all the blocks of the district and have been presented in Tables 4.8 to Table 4.9. It can be observed from the tables that in case of cereals, pulses, oilseeds, vegetables and spices etc; the farmers are using higher seed rates as compared to the recommendations of state agricultural university. The higher seed rates used in different field crops may be attributed to the lack of technical know how about the optimum doses or due to the fact that farmers under-estimate the germination percentage of the seed under the rainfed farming situation with tractor sowing. The majority of the farmers use higher seed rate in maize because they follow the practice of thinning the crop which is used as fodder for the livestock. The block wise pattern of seed use has been found to be more or less similar in all the developmental blocks of the district. On the other hand, fertilizer is also identified as the critical input which influences the productivity of crop cafeteria. In contrast to the seed, the fertilizer used by the farmers in different crops (aggregated for all crops) was found

to be lower as compared to the actual requirements of different crops as per the recommendations of state agricultural university (Table 4.10). It emerges from the interactions with the respondents that the fertilizers use in terms of plant nutrients (N, P&K) was imbalanced in all the crops due to the fact that fertilizers containing N, P&K or complex fertilizers were not available in the cooperative societies at proper time. Similarly, among all these critical inputs, the role of FYM in maintaining the soil health with respect to water holding capacity, aeration, and microbial activities is of vital importance. The actual use of the FYM was also low as compared to the recommendations of the university due to the decreasing population of the livestock especially bullocks in the district. The quantity of the FYM can be increased to the desired levels through the adoption of composting technologies.

At present, the farmers are trying to diversify their cropping system through the introduction of cash crops, mainly, vegetable crops whose nutrient requirement is higher as compared to the traditional crops. This will further widen the gap between the available and required plant nutrients which will affect the productivity levels of the crops by making the soils nutrient deficit. Therefore, in order to increase the productivity of different crop there is need to ensure the supply of complex fertilizers as well as the fertilizer brands which supply the single nutrient as per the requirement of the crops. There is a need to educate the farmers about the balanced use of critical inputs through need based training and awareness programmes.

4.6 Yield Gap Analysis

Yield of any crop in a particular locality is the overall result of soil and environmental factors, input use and management. The gaps in yield of crops have been estimated on the basis of average farm's yield of the blocks and as obtained by the progressive farmers of the same block (Table 4.11 and Table 4.12). It is evident that there is significant difference between the average yield of the area and the yield of the progressive farmer in case of cereals, pulses and oilseeds (Table 4.11). The per cent increase in the yield of progressive farmers over average yields varies between 15-39 per cent in case of maize, 21-63 per cent in case of paddy and 38-46 per cent in case of wheat in different blocks. This clearly indicates the difference in management practices adopted by the farmers of different blocks. This Table further indicates that the yield gap was comparatively higher in case of barley, pulses and oilseeds due to the fact that the average farmer grows these crops on marginal lands, whereas, the progressive farmers grow these crops on fertile piece of land. Similar gaps in the yield of progressive and average farmers were also observed in case of vegetable crops (Table 4.12). These gaps can be bridged through improved management practices, awareness among the farmers and by ensuring the supply of critical inputs well in time.

4.7 Reasons for Gap in Yields

During the survey, an attempt was made to identify the major factors responsible for the yield gaps between progressive and average farm situation and the same have been presented in Table 4.13 for cereals, pulses and oilseed crops and in Table 4.14 for vegetable and spice crops. Number of reasons/ issues responsible for the low yields of different crops as reported by respondents include lack of technical know- how, non- availability of quality inputs (seeds, plant protection material, fertilizers etc.) inadequate knowledge, lack of irrigation and management of

weeds in crops. In case of pulses and oilseeds, the major reason for the low yield of crops in different blocks was the cultivation of these crops on the poor land under average farm situation. One of the most common factors responsible in all the crops was the imbalanced use of fertilizers (N, P&K) due to the non-availability as well as the lack of knowledge about the balanced use of fertilizers in different crops. Thus, there existed a significant difference between the yields of progressive farmers and the average farmer of different blocks, despite the fact that both were working under similar set of situations with respect of climate, soil and infra-structural arrangements. This suggests that the progressive farmers were putting their best efforts in the arrangement of critical inputs and practices in different crop operations at proper time in consultation with the extension workers of line departments. Therefore, there is a need to increase the awareness of the farmers with respect to technical know-how of different crops through trainings, demonstrations and improving the critical input distribution system to the door steps of the farming community. The respondents have shown their concern about the increasing menace of wild and stray cattle which is becoming a major threat for the farming community. This needs a formulation of separate strategy by the government.

4.8 Farm Mechanization

During the survey it was gathered from the respondents that new generation showed little interest in agriculture and only the aged section of the population was engaged in most of the agricultural operations of the crop production and livestock management. The field preparation and seed sowing operations for cereals, pulses and oilseeds were carried out by tractor in most of the areas due to non-availability of bullocks at household level. Most commonly used farm implements in the district were maize sheller, thresher, tractor, iron plough, spray pump/ power sprayer, chaff cutter, power tiller and water lifting devices (Table 4.15). It can be seen from the table that among the different farm implements, the percentage of farmers using threshers was more than 95 per cent in all blocks of the district. Similarly, the percentage of households using maize sheller, tractor for sowing and chaff cutter etc; was more than 50 per cent. The extent of use of the machinery and equipments was comparatively lower in case of Tauni Devi and Sujampur blocks due to the small size of fields and steep hilly terrain as compared to other three blocks of the district.

The table further reveals that the extent of use of spray pumps in different blocks of the district varied between 13-38 per cent of households because of the fact that pumps were generally used by vegetable growers and farmers hardly used these in maize and wheat crops.

4.9. Existing Schemes for Agricultural Development

In order to accelerate the agricultural growth, the state departments (Agriculture, Horticulture, Animal Husbandry, Fisheries etc.) implement various schemes to increase the productivity of different crops/enterprises for improving the socio-economic status of farming families. The status of the existing schemes for agricultural development like watershed development, soil conservation and irrigation etc; in terms of number of schemes, villages covered, population covered, area covered and number of beneficiaries for agricultural development has been presented in Tables 4.16 to 4.21. Table 4.16 indicates that department of agriculture is implementing four schemes (two schemes on water harvesting and two schemes on soil and

water conservation) and nine other schemes such as macro management, ISOPOM, distribution of fertilizers, RKVY, Biogas Development Programme, Rashtriya Krishi Bima Yojana, Soil Testing Scheme and Support to State Extension Reform Project in all the development blocks of the district. Under the water harvesting schemes, the highest area is covered under Nadaun and Hamirpur blocks whereas the area covered is lowest in Tauni Devi (130 hectares). Similarly, the area covered under other agriculture schemes is also lowest in Tauni Devi whereas, it is highest in Nadaun followed by Bijhari blocks. The status of irrigation infrastructure of the district has been presented in Table 4.17-4.21. The Table 4.17 indicates that there are 50 completed lift irrigation schemes in which the share of Nadaun is highest followed by Bijhari. However, in Tauni Devi only three schemes have been completed. Under kuhl and tank irrigation in the 27 kuhl irrigation and 141 Tank irrigation schemes have been completed with highest coverage under kuhl irrigation in Bhoranj (20 number) and tank irrigation schemes are in Bijhari block. It is interesting to note that out of the total lift irrigation, kuhl, and tank irrigation schemes, 35, 6 and 139 are functional which formed about 70, 6 and 98.6 per cent of total completed irrigation structures, respectively. In the district, there were 11 on-going irrigation schemes in Bijhari block (Table 4.20). The total requirements of funds for the repair and maintenance of different irrigation schemes has been estimated at Rs 586 lakhs.

4.10 Varietal and Technological Problems

The farming community of the district is growing different crops i.e. cereals, pulses, oilseeds and vegetables etc. In the earlier section, the reasons for low yields of the average and progressive farmers were identified. An attempt was also made to identify the technological and varietal parameters which were mainly responsible for the low yields. Therefore, in order to obtain the progressive farmer's yield at average farm situation, number of technological and varietal interventions were required to be addressed which have been summarized in Tables 4.22 to 4.27. The cursory glance at the tables indicates that the different crop groups faced problems of crop specific diseases, insect-pests, poor quality of seeds, weeds, varietal problems and lack of technical know how. In addition, monkey menace and stray cattle are posing serious problems in a large proportion of panchayats (Table 4.22 - 4.25). The interventions required to solve these problems include organizing training camps to educate the farmers about the latest technical know-how about varieties, application of different inputs, eradication of weeds, management of insect-pest and diseases and ensuring timely availability of seeds and other inputs.

4.11 Extension Gaps in Yield of Crops

The extension yield gaps have been defined in two ways. First, the difference in yields obtained at the experimental farms of the Himachal Pradesh Agricultural University and the actual average yields of the average farmers in different blocks (Gap I). Second, the difference in yields which have been obtained by the progressive farmers and those obtained by the average farmers (Gap II). The extension yield gaps in different crop groups have been presented in Tables 4.28 to 4.30. These tables show significant gap between the average yields of progressive farmers and those obtained at University farms and the actual yields of average farmers. These yield gaps bring out a huge potential to increase production of different crops in all the six blocks of the district provided concerted efforts be made to bridge extension yield gaps by strengthening the existing extension infrastructure. It may also be underlined that even if we ignore differences in

yields as reported by university and that of average farmers by arguing that it was difficult for an average farmer to apply inputs with the scientific precision as was done at the experiments or on farm testing yet there was still a significant difference in yields obtained by the average farmers and those obtained by the progressive farmers in their neighbouring villages or may be in the same village.

4.12 Extension Interventions

The following extension interventions have been suggested by sampled panchayats to bridge the yield gaps between the yields of average farmers and that of progressive farmers.

- Provision of quality inputs like improved seeds, fertilizers, plant protection material by improving and strengthening delivery system to ensure timely availability of these inputs.
- Supply of hybrid seeds of different crops.
- Soil testing facilities and improvement of physical, chemical and biological parameters on the basis of nutrients available in the soil and required for different crops. Emphasis must be given to improve soil health rather than simple plant nutrients.
- Promotion of integrated nutrient management through vermi-composting, popularization of bio-fertilisers, and other ameliorants in addition to judicious and balanced nutrients to crops. Strengthening and improvement of quality control infrastructure (seed, pesticides and fertilizer testing laboratories).
- Promotion of micro-irrigation for efficient management and delivery of required quantities of water as per crop needs so that the additional area could be brought under irrigation.
- Promotion of mechanization conducive to hill farming and equipments and implements to reduce labour and drudgery of the women folk.
- Promotion of protected cultivation along with supporting infrastructure for quality production of high-value cash crops.
- Strengthening the existing marketing infrastructure like construction of village link roads and establishing collection centers for a cluster of villages.
- Provision of assured irrigation to rain-fed areas and water harvesting to create water potential for irrigation and to augment ground water
- Organizing frequent training camps for farmers, particularly for the cultivation of high value cash crops like vegetables, spices and flower.

- Initiation of suitable measures to tackle monkey menace and problem of stray cattle and wild boars.

4.13 Researchable Issues

In view of the prevailing diseases, problems and interventions suggested and on-going climate change, the following set of researchable issues has been identified in crop production. The research agenda of the R & D institutions of the state should, therefore, include research on these issues. The funds for undertaking research on these issues have been provided in the plan under research and extension head.

- Characterization and classification of soils.
- Delineation of the Acid Soil Regions (ASR).
- Integrated Nutrient Management (INM) technology demonstration on farm fields.
- Issues in solid waste management for organic farming in major cash crops of respective region.
- Evaluation of resource conservation technologies (like conservation tillage, deficit water management, pressurized irrigation systems, nutrient-water interaction studies, recycling of waste organic residues etc.) for irrigated and rain fed areas.
- Issues related to increasing water productivity of stored water through crop diversification and soil and water management practices.
- Development of high yielding varieties of various crops having wider adaptability and resistance to various biotic and abiotic stresses, through exploitation of land races, agronomic basis and alien species using conventional as well as non-conventional breeding approaches.
- Refinement in the technology and development of improved varieties of various niche based crops such as special purpose corn e.g. baby corn, sweet corn, and pop corn.
- Development of hybrid varieties of maize and rice to raise overall productivity of these two important crops.
- Concerted efforts on ensuring effective selection, conservation evaluation, documentation and utilization of genetic resources.
- Formulation of bio-intensive IPM strategies for the management of *Helicoverpa armigera* (tomato and gram), fruit flies (cucurbits and tomatoes), white grubs (potato, maize, peas, ginger, cabbage etc), cut worms (cereals and vegetables), fruit borer (brinjal and okra), leaf miner and pod borer (peas), hairy caterpillar (mash, til, soybean), stem borer and aphids (maize), mites (pulses and vegetables) and plant parasitic nematodes (cereals and vegetables). Insect pest and nematode management under protected cultivation situations.
- Management of insecticide resistance in field populations of *Helicoverpa armigera*, *Spodoptera litura*, *Leucinodes orbonalis*: and *Trialeurodes vaporariorum*.

- Collection and utilization of local strains of entomopathogenic organisms for insect pest management under organic farming situations.
- Identification and utilization of native botanicals for eco-friendly pest management.
- Germplasm screening for resistance against major insect pests (cereals, pulses, oilseeds and vegetables).
- Survey and surveillance for identification of new invasion of insect pests and major diseases.
- Safe management alternatives for the stored grain pests.
- Identification and management of insect-pests of medicinal, aromatic and ornamental plants.
- Development/identification of bacterial wilt resistant hybrids/varieties of *solanaceous* vegetables.
- Development/identification of hybrids and varieties of potential vegetable crops.
- Development of hybrids and production technology for protected cultivation.
- Identification of vegetable based promising cropping sequences.
- Standardization of agro-technology for organic vegetable production.
- Development/refinement of production technology in ginger and colocasia.
- Standardization of production technology of hybrids.
- Standardization of production technology for rainfed cultivation of potential vegetable crops.
- Identification of resistant sources and study of genes of resistance.
- Marker assisted selection of resistant genes using molecular markers and their use in gene pyramiding for resistance in commercial varieties.
- Development of integrated disease management modules suitable for organic and protected agriculture conditions.
- Development of detection techniques for pathogens of quarantine importance and certification purposes.
- Development of IDM module.
- Analysing trends and patterns of prices and markets of emerging crops and enterprises in the context of ongoing process of globalization.
- Understanding economic implications of climate change towards cropping systems, cropping patterns and livelihoods of the farmers.
- Assessing impact of the on-going process of crop diversification on natural resource base (soil, water and environment) and its implications towards livelihoods of the farmers.

Table 4.1 Block Wise Land Utilization Pattern (ha) of Hamirpur District, Himachal Pradesh

Sr No	Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
1	Total geographical area	20304	10203	12720	24741	27920	13540	109428
2	Forests	1282	1282	1157	5805	8504	992	19012
	% of total geographical area	6.27	12.56	9.10	23.46	30.46	7.33	17.37
	Productive	740	1482	881	3540	3085	592	10320
	Degraded	532	682	276	2265	2056	400	6211
3	Barren and uncultivable land	2168	1602	324	5464	3257	2574	15389
	% of total geographical area	10.68	15.70	2.55	22.08	11.67	19.01	14.06
	Rocky	561	2801	77	1864	1257	1574	8134
	Stony	702	1125	105	2000	1000	600	5532
	Slopy	905	2276	142	1600	1000	400	6323
4	Land put to non-agricultural uses	906	1649	229	3955	2200	2481	11420
	% of total geographical area	4.46	16.16	1.80	15.99	7.88	18.32	10.44
	Buildings	206	1208	120	555	1300	879	4268
	Roads/paths/channels etc	200	600	109	400	900	1602	3811
5	Culturable waste	4325	380	605	542	1800	217	7869
	% of total geographical area	21.30	3.72	4.76	2.19	6.45	1.60	7.19
	Weed/bush infested	2700	200	360	327	1250	151	4988
	Area prone to animal menace	1625	110	245	215	550	66	2811
6	Permanent pasture and other grazing lands	3813	102	2197	0	3363	2797	12272
	% of total geographical area	18.78	1.00	17.27	0.00	12.05	20.66	11.21
	Productive	2402	2316	1901		2993	1497	11109
	Degraded	1411	286	296		370	1300	3663
7	Land under miscellaneous trees and groves	0	152	40	15	1106	0	1313
	% of total geographical area	0.00	1.49	0.31	0.06	3.96	0.00	1.20
8	Fallow land	1619	352	0	1566	0	1598	5135
	% of total geographical area	7.97	3.45	0.00	6.33	0.00	11.80	4.69
	Current fallow	1619	323	0	1563	0	1598	5103
	Other fallow	0	29	0	3	0	0	32
9	Cultivated land	6201	4684	8168	7394	7690	2881	37018
	% of total geographical area	30.54	45.91	64.21	29.89	27.54	21.28	33.83

Source Field Survey, 2007-08

Table 4.2 Problems in Land Development (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Sr.No.	Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
	Forest							
	Productive							
1.	Hilly terrain covered with obnoxious weeds and large trees	60.00	75.00	50.00	66.67	80.00	50.00	64.29
2.	Maximum area rainfed	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3.	Existence of bushes, cactus and other unwanted plants	80.00	75.00	75.00	66.67	100.00	50.00	75.00
4.	Mostly fuel wood trees	40.00	75.00	75.00	66.67	80.00	75.00	67.86
	Degraded							
	Woody plants	80.00	75.00	100.00	83.33	60.00	75.00	78.57
	Barren and uncultivated land							
1.	Rockey	80.00	75.00	50.00	66.67	60.00	100.00	82.14
2.	Land covered with rocks and big boulders	80.00	50.00	50.00	50.00	80.00	75.00	64.29
3.	Steep slopes	100.00	100.00	100.00	100.00	100.00	100.00	100.00
4.	Maximum area rain-fed	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5.	Difficult to manage	80.00	50.00	75.00	50.00	80.00	100.00	71.43
	Land put to non-agricultural uses							
	Roads/Paths/Channels							
1.	Cannot be put under agriculture	60.00	25.00	50.00	50.00	40.00	75.00	50.00
2.	Infested with weeds	100.00	125.00	100.00	83.33	80.00	100.00	96.43
	Culturable Waste							
1.	Weeds/bush Infested	60.00	75.00	75.00	66.67	60.00	50.00	64.29
2.	Area under obnoxious weeds	60.00	75.00	75.00	50.00	80.00	75.00	67.86
3.	Lack of knowledge about weed eradication	100.00	100.00	75.00	50.00	80.00	75.00	78.57

Table 4.2 contd.....

	Prone to animal menace																		
1.	Stray animal	20.00	50.00	75.00	66.67	60.00	50.00	50.00	50.00	53.57									
2.	Monkey menace	80.00	50.00	50.00	66.67	80.00	75.00	75.00	75.00	67.86									
3.	Wild boar problem	80.00	50.00	25.00	66.67	80.00	50.00	50.00	50.00	60.71									
4.	Area difficult to manage	80.00	50.00	75.00	50.00	80.00	100.00	100.00	100.00	71.43									
5.	Technology not known	60.00	75.00	50.00	50.00	80.00	75.00	75.00	75.00	64.29									
	Permanent pasture and other grazing lands																		
	Productive																		
1.	Poor yielding grass varieties	100.00	100.00	100.00	83.33	100.00	100.00	100.00	100.00	96.43									
2.	Local grasses	100.00	100.00	100.00	83.33	100.00	100.00	100.00	100.00	96.43									
3.	Infestation with lantana and other weeds	60.00	75.00	50.00	50.00	60.00	50.00	50.00	50.00	57.14									
	Degraded																		
1.	Government land and public property	60.00	100.00	100.00	66.67	100.00	75.00	75.00	75.00	82.14									
2.	Weed infestation	80.00	100.00	75.00	66.67	60.00	75.00	75.00	75.00	75.00									

Source: Field Survey, 2007-08

Table 4.3 Interventions for Land Development (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Sr. No.	Intervention	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
	Forest							
	Productive							
1	Plantation of productive tree sp.	80.00	75.00	75.00	66.67	80.00	75.00	75.00
2	Land development and eradication of weeds	60.00	100.00	75.00	83.33	60.00	100.00	78.57
3	Training to go for other enterprise	20.00	50.00	50.00	33.33	20.00	25.00	32.14
4	Quality forest planting material	60.00	75.00	75.00	50.00	40.00	50.00	57.14
	Degraded							
1	Plantation on degraded area	80.00	100.00	100.00	83.33	60.00	75.00	82.14
	Barren and uncultivable land							
	Rocky							
1	Levelling required	100.00	75.00	75.00	66.67	60.00	75.00	75.00
2	Contour bunding	40.00	50.00	50.00	50.00	60.00	50.00	50.00
3	Irrigation facility	60.00	75.00	50.00	66.67	40.00	50.00	57.14
	Land put to non-agricultural uses							
	Roads/paths/channels							
1	Provision for funds for repair and maintenance	80.00	100.00	75.00	50.00	40.00	100.00	71.43
	Culturable waste							
	Weed/bush infested							
1	Eradication of weeds	60.00	75.00	50.00	66.67	60.00	100.00	67.86
2	Awareness programme and introduction of grasses replacing weeds	80.00	50.00	75.00	33.33	60.00	75.00	60.71
3	Plantation of fodder trees and fruit trees	60.00	50.00	75.00	50.00	40.00	75.00	57.14
4	Knowledge of weedicide for eradication	80.00	75.00	50.00	66.67	80.00	100.00	75.00

Table 4.3 cont.....

	Area prone to animal menace												
1	Permission to export monkeys	80.00	50.00	75.00	66.67	80.00	75.00	75.00					71.43
2	Fencing to stop stray animals	60.00	75.00	50.00	66.67	60.00	75.00	75.00					64.29
	Area difficult to manage												
1	Provision for funds	40.00	75.00	50.00	50.00	60.00	75.00	75.00					57.14
	Permanent pasture and other grazing lands												
	Productive												
1	Introduction of improved grass cuttings	60.00	75.00	50.00	66.67	80.00	75.00	75.00					67.86
2	Weeds eradication programme	100.00	100.00	100.00	83.33	100.00	100.00	100.00					96.43
	Degraded												
1	Introduction of fodder-trees and grasses	80.00	50.00	75.00	66.67	80.00	75.00	75.00					71.43
2	Weeds eradication programme	100.00	75.00	75.00	66.67	60.00	75.00	75.00					75.00

Source: Field Survey, 2007-08

Table 4.4 Improvement Needed to Increase the Productivity of Land (Ha) in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Land levelling	3266	3605	346	3402	2565	3540	16724
Contour bunding and terracing	1575	987	895	1015	2452	865	7789
Fencing (length in km)	2515	2502	3603	2503	1150	2510	14783
Check dam (Length in m)	5610	550	4505	3035	3256	4102	21058

Source: Field Survey, 2007-08

Table 4.5 Financial Estimates for Land Improvement (Rs. Lakh) in Hamirpur District of Himachal Pradesh

Sr. No.	Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
1	Barren and uncultivable land							
	Rocky/stony/sloppy	32.5	93	27.1	82	48.9	38.6	322.1
2	Land put to non-agricultural uses							
	Buildings	0.2	1.2	0.1	0.6	1.3	0.9	4.3
	Roads/paths/channels	1	3	0.3	2	4.5	8	18.8
3	Culturable waste							
	Weed/bush infested	96.8	6	12	72.5	37.5	4.5	229.3
	Area prone to animal menace	32.5	2.2	4.9	22.5	11	1.3	74.4
4	Permanent pasture and g. lands							
	Productive	28.97	25.73	32.5	0	0	21.5	108.7
	Degraded	14.6	0	0	0	0	11.5	26.1
5	Land under misc. tree crops							
	Fallow land	0	3.8	0	0.3	22.2	0	26.3
6	Fallow land							
	Current fallow	32.3	0	0	31.3	0	32	95.6
	Other fallow	0	0	0	0.1	0	0	0.1
7	Cultivated land							
	Cultivated land	62	39	61.3	73.9	111.3	28.8	376.3
	Total	300.87	173.93	138.2	285.2	236.7	147.1	1282

Source: Field Survey, 2007-08

Table 4.6 Major Cropping Systems in Hamirpur District of Himachal Pradesh

Cropping sequences	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur
Unirrigated						
Maize-wheat	✓	✓	✓	✓	✓	✓
Paddy-wheat	✓	✓	✓	✓	✓	✓
Maize-toria-wheat	✓	✓	✓	✓	✓	✓
Maize-sarson	✓	✓	✓	✓	✓	✓
Maize-toria+gobhi sarson	✓	✓	✓	✓	✓	✓
Maize-wheat+sarson	✓	✓	✓	✓	✓	✓
Mash-gram	✓	✓	✓	✓	✓	✓
Maize-potato	✓	✓	✓	✓	✓	✓
Paddy-berseem	✓	✓	✓	✓	✓	✓
Chari-berseem	✓	✓	✓	✓	✓	✓
Tomato-wheat	✓	✓	✓	✓	✓	✓
Okra-wheat	✓	✓	✓	✓	✓	✓
Cucurbits-wheat	✓	✓	✓	✓	✓	✓
colocasia-wheat	✓	✓	✓	✓	✓	✓
Maize-onion/garlic	✓	✓	✓	✓	✓	✓
Colocasia- onion	✓	✓	✓	✓	✓	✓
Sugarcane	✓	✓	✓	✓	✓	✓
Irrigated						
Maize-wheat	✓	✓	✓	✓	✓	✓
Maize-potato	✓	✓	✓	✓	✓	✓
Maize-toria-wheat	✓	✓	✓	✓	✓	✓
Paddy-wheat	✓	✓	✓	✓	✓	✓
Tomato-cauliflower	✓	✓	✓	✓	✓	✓
Okra-radish-cauliflower	✓	✓	✓	✓	✓	✓
Summer squash-tomato-cauliflower	✓	✓	✓	✓	✓	✓
Capsicum-brinjal-cauliflower	✓	✓	✓	✓	✓	✓
Cucurbits-cole crops	✓	✓	✓	✓	✓	✓

Source: Field Survey, 2007-08

Table 4.7 Cropping Pattern (Ha) in Hamirpur District of Himachal Pradesh

Crops	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Cereals	11625	8388	15090	13695	13300	7363	69461
Maize	5650	4100	6250	6756	6250	3700	32706
Paddy	110	80	1400	174	35	150	1949
Wheat	5850	4200	7320	6750	7000	3500	34620
Barley	15	8	120	15	15	13	186
Pulses	59	143	39	175	82	87	585
Mash	45	80	12	90	45	80	352
Gram	12	60	25	82	35	5	219
Lentil	2	3	2	3	2	2	14
Oilseeds	20	100	60	55	100	49	384
Sesame	5	40	5	26	10	30	116
Sarson	2	5	8	2	15	5	37
Toria	10	40	42	22	50	10	174
Gobhi sarson	3	15	5	5	25	4	57
Fodder		110	564				
Others	25		5	5			35
Vegetables	423	287	550	801	480	345	2886
Tomato	5	12	10	35	20	10	92
Peas	10	12	60	20	10	5	117
Bhindi	75	39	150	105	50	65	484
Cucumber	20	12	9	65	35	25	166
Bottle gourd	20	26	8	25	25	25	129
Bittergourd	15	14	10	20	20	24	103
Brinjal	8	18	10	10	15	8	69
Capsicum	7	14	15	3	10	12	61
Cabbage	15	12	15	30	10	15	97

Table 4.7 cont.....

Cauliflower	12	28	30	85	40	20	215
Colocasia	95	14	17	15	75	45	261
Onion	10	18	50	65	90	13	246
Others	131	68	166	323	80	78	846
Spices	30	22	30	30	38	27	1898
Ginger	15	12	12	15	8	13	75
Garlic	15	10	18	15	30	14	102
All crops	12182	8940	15774	14761	14000	7871	75249

Source: Field Survey, 2007-08

Table 4.8 Seed Use, Requirement and Gaps in Cereals, Pulses and Oilseeds Crops Kg/ha in Hamirpur District of Himachal Pradesh)

Crop	Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur
Maize	U	46.50	44.50	45.00	37.90	41.25	43.50
	R	20.00	20.00	20.00	20.00	20.00	20.00
	G	-26.50	-24.50	-25.00	-17.90	-21.25	-23.50
Wheat	U	150.66	142.15	148.23	137.65	144.98	153.26
	R	120.00	120.00	120.00	120.00	120.00	120.00
	G	-30.66	-22.15	-28.23	-17.65	-24.98	-33.26
Paddy	U	108.70	114.25	106.35	109.36	110.11	107.15
	R	90.00	90.00	90.00	90.00	90.00	90.00
	G	-18.70	-24.25	-16.35	-19.36	-20.11	-17.15
Barley	U	135.63	145.89	144.25	153.25	139.55	146.89
	R	120.00	120.00	120.00	120.00	120.00	120.00
	G	-15.63	-25.89	-24.25	-33.25	-19.55	-26.89
Mash	U	25.63	28.13	29.10	26.89	27.79	30.11
	R	20.00	20.00	20.00	20.00	20.00	20.00
	G	-5.63	-8.13	-9.10	-6.89	-7.79	-10.11
Gram	U	60.25	55.13	57.10	49.15	51.10	53.15
	R	45.00	45.00	45.00	45.00	45.00	45.00
	G	-15.25	-10.13	-12.10	-4.15	-6.10	-8.15
Lentil	U	60.25	55.13	57.10	49.15	51.10	53.15
	R	25.00	25.00	25.00	25.00	25.00	25.00
	G	-35.25	-30.13	-32.10	-24.15	-26.10	-28.15
Toria	U	18.90	19.75	20.25	16.18	19.38	20.66
	R	15.00	15.00	15.00	15.00	15.00	15.00
	G	-45.25	-40.13	-42.10	-34.15	-36.10	-38.15
Gobhi Sarson	U	10.95	10.36	9.75	8.80	10.36	9.15
	R	6.00	6.00	6.00	6.00	6.00	6.00
	G	-4.95	-4.36	-3.75	-2.80	-4.36	-3.15
Sesame	U	7.25	6.95	7.57	7.25	6.90	6.88
	R	5.00	5.00	5.00	5.00	5.00	5.00
	G	-2.25	-1.95	-2.57	-2.25	-1.90	-1.88

Note: U-used, R-Required and G-Gap; Source: Field Survey, 2007-08

Table 4-9 Seed Use, Requirement and Gaps in Vegetables and Spices (Kg/ha) in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi			Hamirpur			Bhoranj			Nadaun			Bijhari			Sujanpur			
	U	R	G	U	R	G	U	R	G	U	R	G	U	R	G	U	R	G	
Vegetables																			
Tomato	0.48	0.50	0.02	0.52	0.50	-0.02	0.60	0.50	-0.10	0.55	0.50	-0.05	0.56	0.50	-0.06	0.60	0.50	-0.10	
Tomato (H)	0.25	0.15	-0.10	0.29	0.15	-0.14	0.21	0.15	-0.06	0.19	0.15	-0.04	0.19	0.15	-0.04	0.31	0.15	-0.16	
Peas (Early)	100	125	25	115	125	10	110	125	15	115	125	10	118	125	7	135	125	-10	
Peas (Late)	65.00	70.00	5.00	75.00	70.00	-5.00	64.00	70.00	6.00	69.00	70.00	1.00	76.00	70.00	-6.00	77.00	70.00	-7.00	
Okra	22.50	20.00	-2.50	23.50	20.00	-3.50	19.50	20.00	0.50	25.30	20.00	-5.30	25.50	20.00	-5.50	22.40	20.00	-2.40	
Cucumber	4.25	4.00	-0.25	4.50	4.00	-0.50	5.25	4.00	-1.25	4.75	4.00	-0.75	4.80	4.00	-0.80	4.60	4.00	-0.60	
Bottle gourd	6.15	5.00	-1.15	7.10	5.00	-2.10	6.55	5.00	-1.55	5.80	5.00	-0.80	6.80	5.00	-1.80	7.10	5.00	-2.10	
Brinjal	0.72	0.60	-0.12	0.78	0.60	-0.18	0.83	0.60	-0.23	0.69	0.60	-0.09	0.82	0.60	-0.22	0.85	0.60	-0.25	
French Beans (Dwarf)	80.00	75.00	-5.00	84.26	75.00	-9.26	82.14	75.00	-7.14	80.00	75.00	-5.00	84.26	75.00	-9.26	82.14	75.00	-7.14	
French Beans(Pole)	42	30	-12	42	30	-12	46	30	-16	39	30	-9	44	30	-14	17	30	13	
Capsicum	1.00	0.80	-0.20	0.85	0.80	-0.05	0.89	0.80	-0.09	0.91	0.80	-0.11	0.95	0.80	-0.15	0.92	0.80	-0.12	
Capsicum(H)	0.45	0.25	-0.20	0.44	0.25	-0.19	0.39	0.25	-0.14	0.38	0.25	-0.13	0.45	0.25	-0.20	0.47	0.25	-0.22	
Cauliflower (Early)	0.95	0.75	-0.20	1.10	0.75	-0.35	0.90	0.75	-0.15	1.20	0.75	-0.45	0.85	0.75	-0.10	0.96	0.75	-0.21	
Cauliflower (Late)	0.95	0.63	-0.33	1.10	0.63	-0.48	0.90	0.63	-0.28	1.20	0.63	-0.58	0.85	0.63	-0.23	0.96	0.63	-0.34	
Cabbage	1.15	0.70	-0.45	1.20	0.70	-0.50	1.02	0.70	-0.32	0.90	0.70	-0.20	0.95	0.70	-0.25	1.08	0.70	-0.38	
Colocasia	1800	2000	200	1973	2000	27	1755	2000	245	1886	2000	114	2200	2000	-200	1615	2000	385	
Onion	12.50	10.00	-2.50	13.50	10.00	-3.50	12.10	10.00	-2.10	12.20	10.00	-2.20	13.12	10.00	-3.12	12.50	10.00	-2.50	
Potato	2453	2600	147	2710	2600	-110	2567	2600	33	2453	2600	147	2710	2600	-110	2567	2600	33	
Spices																			
Ginger	2255	2000	-255	1880	2000	120	1905	2000	95	2110	2000	-110	1765	2000	235	1946	2000	54	
Garlic	590	550	-40	625	550	-75	650	550	-100	615	550	-65	680	550	-130	640	550	-90	

Note: U-used, R-Required and G-Gap
Source: Field Survey, 2007-08

Table 4.10 Fertilizer Use, Requirement and Gaps (metric tonnes) in Hamirpur District of Himachal Pradesh

Particulars		Urea (46 %N)	CAN (25%N)	IFFCO (12:32:16)	MOP (60%)	SSP (16%)	FYM (‘000’mt)
Tauni Devi	U	1015	3	140	2	5	80
	R	1225	25	231	4	7	152
	G	210	23	91	2	2	72
Hamirpur	U	530	1	73	1	3	42
	R	639	13	121	2	4	79
	G	110	12	48	1	1	37
Bhoranj	U	728	2	100	1	3	57
	R	879	18	166	3	5	109
	G	151	16	65	1	2	51
Nadaun	U	1280	3	176	2	6	101
	R	1545	32	291	5	9	191
	G	265	28	115	3	3	91
Bijhari	U	1059	3	146	2	5	84
	R	1279	26	241	4	7	158
	G	219	24	95	2	2	75
Sujanpur	U	441	1	61	1	2	35
	R	533	11	100	2	3	66
	G	91	10	40	1	1	31
District	U	5054	13	696	10	24	399
	R	6100	125	1150	20	35	756
	G	1046	112	454	10	11	357

Note: U: Use; R: Requirement, G: Gap in physical values

Source: Field Survey, 2007-08

Table 4.11 Yield Gaps in Important Cereals, Pulses and Oilseed Crops (Q/ha) in Hamirpur District of Himachal Pradesh

Crops	Tauni Devi		Hamirpur		Bhoranj		Nadaun		Bijhari		Sujanpur		District								
	A	P	G	A	P	G	A	P	G	A	P	G	A	P	G						
Cereals																					
Maize	26.64	32.15	5.5	24.58	28.55	3.97	25.41	29.43	4.02	21.50	29.10	7.60	23.96	30.64	6.68	16.64	23.15	6.51	23.44	28.84	5.40
Paddy	16.15	22.63	6.48	15.96	26.11	10.15	22.78	27.64	4.86	23.12	28.10	4.98	17.45	21.89	4.44	15.81	21.80	5.99	21.52	24.70	3.18
Wheat	15.12	22.11	6.99	16.10	23.10	7.00	17.65	23.25	5.60	18.25	26.75	8.50	14.90	21.25	6.35	16.78	23.21	6.43	16.51	23.28	6.77
Barley	8.90	13.65	4.75	10.46	14.32	3.86	12.28	19.75	7.47	14.96	22.15	7.19	11.35	18.10	6.75	11.20	15.80	4.60	11.99	17.30	5.31
Pulses																					
Mash	4.10	7.81	3.71	4.30	8.10	3.80	4.45	7.43	2.98	5.10	8.17	3.07	5.10	6.98	1.88	5.69	7.56	1.87	4.90	7.68	2.78
Gram	5.66	11.25	5.59	6.89	9.55	2.66	6.55	10.08	3.53	7.14	11.63	4.49	6.87	10.54	3.67	7.55	9.63	2.08	6.89	10.45	3.56
Lentil	3.42	5.54	2.12	3.47	6.14	2.67	3.43	5.96	2.53	5.11	6.35	1.24	4.94	5.80	0.86	4.65	6.11	1.46	4.19	5.98	1.79
Oilseeds																					
Sesame	2.98	4.50	1.52	3.10	3.60	0.50	2.10	3.55	1.45	2.27	3.10	0.83	2.55	3.65	1.10	2.80	3.75	0.95	2.74	3.69	0.95
Sarson	4.10	6.15	2.05	4.78	7.96	3.18	4.15	6.11	1.96	6.32	8.12	1.80	5.53	6.90	1.37	4.33	6.25	1.92	4.93	6.92	1.99
Toria	3.63	5.65	2.02	6.11	7.14	1.03	4.47	6.50	2.03	5.90	9.25	3.35	6.12	7.10	0.98	5.96	7.23	1.27	5.54	7.15	1.61
Gobhi Sarson	5.34	7.80	2.46	5.42	8.10	2.68	6.10	7.50	1.40	7.49	12.54	5.05	7.17	8.66	1.49	6.55	8.45	1.90	6.50	8.84	2.34

Note: A-Actual, P- Potential, G-Gap

Source: Field Survey, 2007-08,

Table 4.12 Yield Gaps in Important Vegetable and Spice Crops (Q/ha) in Hamirpur District of Himachal Pradesh

Crops	Tauni Devi		Hamirpur			Bhoranj			Nadaun			Bijhari			Sujanpur			District				
	A	P	G	A	P	G	A	P	G	A	P	G	A	P	G	A	P	A	P			
Vegetables																						
Tomato	264	340	76	278	325	47	298	370	72	345	395	50	276	326	50	230	303	73	299.25	343.2	43.92	
Peas	62	95	33	85	115	30	76	98	22	100	125	25	67	95	28	58	82	24	78.29	101.7	23.38	
Okra	57	75	18	66	81	15	73	98	25	91	109	18	68	89	21	61	84	23	71.73	89.33	17.6	
Cucumber	150	195	45	170	210	40	146	180	34	205	235	30	159	208	49	152	198	46	174.96	204.3	29.37	
Bottle gourd	164	215	51	198	235	37	210	256	46	232	275	43	176	226	50	188	235	47	193.86	240.3	46.47	
Bitter gourd	85	135	50	98	140	42	87	135	48	112	145	33	80	140	60	75	134	59	88.9	138.2	49.27	
Brinjal	168	228	60	195	236	41	150	218	68	211	255	44	173	245	72	173	231	58	180.33	235.5	55.17	
Capsicum	164	198	34	206	238	32	188	234	46	258	284	26	164	210	46	157	202	45	182.79	227.7	44.88	
Cabbage	135	220	85	165	260	95	125	190	65	165	195	30	110	175	65	135	175	40	143.87	202.5	58.63	
Cauliflower	102	145	43	152	175	23	98	160	62	189	217	28	127	185	58	108	167	59	147.56	174.8	27.27	
Colocasia	82	147	65	107	168	61	106	189	83	154	205	51	97	184	87	107	187	80	97.66	180	82.34	
Onion	68	133	65	186	225	39	83	152	69	138	180	42	83	158	75	79	153	74	104.25	166.8	62.58	
Others	85	125	40	97	119	22	87	123	36	111	138	27	88	115	27	94	125	31	97.4	124.2	26.77	
Spices																						
Ginger	47	89	42	73	105	32	55	108	53	103	134	31	53	114	61	57	117	60	66.01	111.2	45.16	
Garlic	89	122	33	104	129	25	84	119	35	121	145	24	77	124	47	83	131	48	89.94	128.3	38.39	

Note: A-Actual, P-Potential, G-Gap

Source: Field Survey, 2007-08,

Table 4.13 Reasons for Yield Gaps in Cereal, Pulse and Oil Seed Crops (Per Cent of Panchayats)

Crop	Reasons for gap in yields	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Cereals								
	Maize							
	Lack of knowledge about package of practices	80.00	75.00	75.00	83.33	80.00	75.00	78.57
	Non availability of inputs in time	60.00	50.00	50.00	33.33	60.00	50.00	50.00
	No irrigation at sowing and water logging	60.00	75.00	50.00	50.00	80.00	75.00	64.29
	Non-availability of quality seeds	20.00	25.00	25.00	33.33	20.00	50.00	28.57
Paddy								
	Non availability of improved varieties	60.00	50.00	75.00	33.33	40.00	50.00	50.00
	Lack of irrigation	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Wheat								
	Termites problem	40.00	50.00	25.00	66.67	40.00	25.00	42.86
	Irrigation and fertilizer problem	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Non availability of inputs in time	40.00	50.00	75.00	50.00	60.00	50.00	53.57
	Lack of technical knowledge	60.00	75.00	75.00	66.67	60.00	75.00	67.86
	Weed problem	40.00	25.00	50.00	33.33	40.00	25.00	35.71
Barley								
	Lack of knowledge about package of practices	60.00	75.00	75.00	66.67	60.00	75.00	67.86

Table 4.13 cont.....

Pulses																					
Mash																					
	Lack of knowledge about package of practices	60.00	75.00	50.00	66.67	60.00	75.00	75.00	64.29												
	Non availability of inputs in time	40.00	50.00	75.00	50.00	60.00	50.00	50.00	53.57												
	Imbalanced use of fertiliser	80.00	75.00	75.00	83.33	80.00	75.00	75.00	78.57												
	Cultivated on poor land	100.00	100.00	100.00	100.00	100.00	100.00	150.00	107.14												
Gram																					
	Lack of knowledge about package of practices	60.00	75.00	50.00	66.67	60.00	75.00	75.00	64.29												
	Non availability of inputs in time	40.00	50.00	75.00	50.00	60.00	50.00	50.00	53.57												
	Poor yield due to imbalanced use of fertilisers	80.00	75.00	75.00	83.33	80.00	75.00	75.00	78.57												
	Cultivated on poor and un-irrigated land	100.00	100.00	100.00	100.00	100.00	150.00	107.14													
Lentil																					
	Lack of knowledge about package of practices	60.00	75.00	50.00	66.67	60.00	75.00	75.00	64.29												
	Non availability of inputs in time	60.00	50.00	50.00	66.67	60.00	50.00	50.00	57.14												
Oilseeds																					
Sesame																					
	Imbalanced use of fertiliser	60.00	75.00	50.00	83.33	60.00	75.00	75.00	67.86												
	Cultivated on poor land	20.00	25.00	50.00	16.67	40.00	25.00	25.00	28.57												
Sarson																					
	Lack of knowledge about package of practices	40.00	75.00	75.00	66.67	60.00	75.00	75.00	64.29												
	Non availability of inputs in time	40.00	50.00	75.00	50.00	60.00	50.00	50.00	53.57												
	Poor yield due to imbalanced use of fertilisers	60.00	50.00	50.00	50.00	60.00	75.00	75.00	57.14												
	Cultivated on poor and un-irrigated land	60.00	75.00	75.00	66.67	60.00	150.00	78.57													
	Lack of irrigation facility	80.00	75.00	50.00	66.67	60.00	50.00	64.29													

Table 4.14 Reasons for Yield Gaps in Vegetable and Spice Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crop	Reasons for gap	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Vegetables								
	Pears							
		60.00	50.00	50.00	50.00	60.00	50.00	53.57
	Lack of knowledge about package of practices	40.00	50.00	50.00	33.33	40.00	50.00	42.86
	Non availability of inputs in time	100.00	75.00	100.00	66.67	80.00	75.00	82.14
	80.00	100.00	100.00	83.33	100.00	100.00	92.86	
Tomato								
		100.00	75.00	100.00	83.33	100.00	100.00	92.86
	Lack of knowledge about package of practices	40.00	75.00	75.00	50.00	40.00	50.00	53.57
	Non availability of inputs in time	100.00	75.00	100.00	66.67	100.00	75.00	85.71
	Lack of irrigation	60.00	50.00	50.00	66.67	60.00	50.00	57.14
Cabbage								
		60.00	50.00	50.00	50.00	60.00	50.00	53.57
	Lack of knowledge about package of practices	40.00	75.00	75.00	50.00	40.00	50.00	53.57
	Non availability of inputs in time	80.00	50.00	75.00	83.33	80.00	75.00	75.00
	Lack of irrigation	60.00	50.00	50.00	66.67	60.00	50.00	57.14
Cauliflower								
		100.00	75.00	100.00	83.33	100.00	100.00	92.86
	Lack of knowledge about package of practices	40.00	75.00	75.00	50.00	40.00	50.00	53.57
	Non availability of inputs in time	100.00	75.00	100.00	66.67	80.00	75.00	82.14
	Lack of irrigation	80.00	75.00	75.00	66.67	60.00	75.00	71.43
Capsicum								
		60.00	50.00	50.00	50.00	60.00	75.00	57.14
	Lack of knowledge about package of practices	40.00	75.00	75.00	50.00	40.00	50.00	53.57
	Non availability of inputs in time	80.00	100.00	75.00	100.00	80.00	75.00	85.71
	Soils related problems (wilt etc.)	40.00	50.00	50.00	50.00	40.00	50.00	46.43
	Inefficient use of technology							

Table 4.15 Farm Machinery Use & Gap in Hamirpur District of Himachal Pradesh

Sr.No.	Machinery	Status	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
1	Maize Sheller	%users	55.21	75.2	71.33	61.25	58.64	65.42	64.51
		E	529	276	380	667	552	230	2634
		R	630	329	452	794	657	274	3136
		G	101	53	72	127	105	44	502
2	Thresher	%users	92.66	98.91	97.33	97.25	95.1	96.12	96.23
		E	477	249	342	602	498	207	2375
		R	515	269	370	650	538	224	2566
		G	38	20	28	48	40	17	191
3	Tractor	%users	52.25	70.15	68.25	79.13	68.47	55.25	65.58
		E	234	122	168	295	244	102	1165
		R	276	144	198	348	288	120	1374
		G	42	22	30	53	44	18	209
4	Iron plough	%users	49.11	35.19	34.65	25.1	42.13	44.47	38.44
		E	2886	1506	2070	3638	3011	1255	14366
		R	3488	1820	2502	4398	3640	1517	17365
		G	602	314	432	760	629	262	2999
5	Spray pump/power sprayer	%users	13.45	25.1	26.1	38.46	32.64	18.56	25.72
		E	353	184	253	444	368	153	1755
		R	10117	5278	7258	12756	10557	4399	50365
		G	9764	5094	7005	12312	10189	4246	48610
6	Chaff cutter	%users	57.65	75.35	66.1	78.65	63.71	62.35	67.30
		E	1111	580	797	1401	1160	483	5532
		R	10559	5509	7575	13313	11018	4591	52565
		G	9448	4929	6778	11912	9858	4108	47033
7	Power tiller	%users	0.02	0.12	0.04	0.21	0.05	0.04	0.08
		E	10	5	7	13	11	5	51
		R	105	55	76	133	110	46	525
		G	95	50	69	120	99	41	474
8	Water lifting devices	%users	4.52	8.25	6.8	12.15	7.56	6.25	7.59
		E	505	264	362	637	527	220	2515
		R	756	394	542	953	789	329	3763
		G	251	130	180	316	262	109	1248

Note: E: Existing No., R: Required No., G: Gap; Source: Field Survey, 2007-08.

Table 4.16 Existing Schemes for Agricultural Development in Hamirpur District of Himachal Pradesh

Block	No. of Schemes	Villages covered (No.)	Population covered (No.)	Area covered (Ha)	Beneficiary families (No)	Status (No.)	
						Complete	Incomplete
Water Harvesting							
Tauni Devi	2	11	960	130	195	11	0
Hamirpur	2	15	2200	340	360	14	0
Bhoranj	2	14	2000	320	390	13	0
Nadaun	2	30	2360	570	712	28	0
Bijhari	2	14	1776	155	230	11	0
Sujanpur	2	17	1870	355	370	13	0
Total	2	101	11166	1870	2257	90	0
Soil/ Land Conservation							
Tauni Devi	2	12	160	28	30	8	4
Hamirpur	2	31	1525	49	293	18	7
Bhoranj	2	30	1600	50	300	26	4
Nadaun	2	26	708	60	180	25	1
Bijhari	2	22	550	19	110	20	0
Sujanpur	2	14	370	30	90	10	4
Total	2	135	4913	236	1003	107	20
Other Agricultural Schemes							
Tauni Devi	9	255	3500	375	650	9	0
Hamirpur	9	197	2568	380	517	9	0
Bhoranj	9	224	3369	489	675	9	0
Nadaun	9	447	5321	648	1112	9	0
Bijhari	9	339	3089	640	538	9	0
Sujanpur	9	173	2815	340	747	9	0
Total	9	1635	20662	2872	4239	9	0

Source: Field Survey, 2007-08

Table 4.17 Status of Completed Irrigation Schemes in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Lift irrigation							
Number	3	8	5	14	11	9	50
Amount spent (Rs. Lakh)	15	98	75	226	221	300	934
Villages covered (No.)	12	17	6	14	22	20	91
Beneficiaries (No.)	250	435	434	1024	309	3650	6102
Command area (ha)	170	447	353	1192	470	505	3137
Actual irrigated area (ha)	86	211	301	372	207	298	1475
Kuhl							
Number	0	7	20	0	0	0	27
Amount spent (Rs. Lakh)	0	9.75	60	0	0	0	69.75
Villages covered (No.)	0	7	22	0	0	0	29
Beneficiaries (No.)	0	95	700	0	0	0	795
Command area (ha)	0	28.57	65	0	0	0	93.57
Actual irrigated area (ha)	0	18.57	65	0	0	0	83.57
Tank irrigation							
Number	0	6	0	0	135	0	141
Amount spent (Rs. Lakh)	0	2.95	0	0	30	0	32.95
Villages covered (No.)	0	6	0	0	95	0	101
Beneficiaries (No.)	0	43	0	0	135	0	178
Command area (ha)	0	19.5	0	0	90	0	109.5
Actual irrigated area (ha)	0	13.5	0	0	10.8	0	24.3

Source: Field Survey, 2007-08

Table 4.18 Status of Functional Irrigation Schemes in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Lift irrigation							
Number	3	6	4	3	11	8	35
Amount spent (Rs. Lakh)	15.04	82.29	47.5	36.62	220.75	0	402.2
Villages covered (No.)	12	13	3	3	22	19	72
Beneficiaries (No.)	4250	313	200	128	309	3500	8700
Command area (ha)	170	296.89	200	156	469.97	475	1767.86
Actual irrigated area (ha)	86.14	181.55	20	0	207.09	248	742.78
Kuhl							
Number	0	4	2	0	0	0	6
Amount spent (Rs. Lakh)	0	2	8.5	0	0	0	10.5
Villages covered (No.)	0	4	2	0	0	0	6
Beneficiaries (No.)	0	57	105	0	0	0	162
Command area (ha)	0	19	140	0	0	0	159
Actual irrigated area (ha)	0	14.5	140	0	0	0	154.5
Tank irrigation							
Number	0	4	0	0	135	0	139
Amount spent (Rs. Lakh)	0	0	0	0	30	0	30
Villages covered (No.)	0	4	0	0	95	0	99
Beneficiaries (No.)	0	30	0	0	135	0	165
Command area (ha)	0	13	0	0	90	0	102.5
Actual irrigated area (ha)	0	9	0	0	11	0	19.8

Source: Field Survey, 2007-08

Table 4.19 Status of Non-Functional Irrigation Schemes in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Lift irrigation							
Number	0	2	1	0	0	1	4
Amount spent (Rs. Lakh)	0	16.06	15	0	0	10	41.06
Villages covered (No.)	0	4	1	0	0	1	6
Beneficiaries (No.)	0	122	150	0	0	150	422
Command area (ha)	0	150	182	0	0	30	362
Actual irrigated area (ha)	0	29.8	40	0	0	0	69.8
Kuhl							
Number	0	3	2	0	0	0	5
Amount spent (Rs. Lakh)	0	2	8	0	0	0	10
Villages covered (No.)	0	3	2	0	0	0	5
Beneficiaries (No.)	0	38	105	0	0	0	143
Command area (ha)	0	9.57	20	0	0	0	29.57
Actual irrigated area (ha)	0	4.07	20	0	0	0	24.07
Tank irrigation							
Number	0	2	0	0	0	0	2
Amount spent (Rs. Lakh)	0	1	0	0	0	0	1
Villages covered (No.)	0	2	0	0	0	0	2
Beneficiaries (No.)	0	13	0	0	0	0	13
Command area (ha)	0	7	0	0	0	0	7
Actual irrigated area (ha)	0	4.5	0	0	0	0	4.5

Source: Field Survey, 2007-08

Table 4.20 Status of Ongoing Irrigation Schemes in Hamirpur District of Himachal Pradesh

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Lift irrigation							
Number	0	0	0	0	11	0	11
Amount spent (Rs. Lakh)	0	0	0	0	220.75	0	220.75
Villages covered (No.)	0	0	0	0	22	0	22
Beneficiaries (No.)	0	0	0	0	309	0	309
Command area (ha)	0	0	0	0	469.97	0	469.97
Actual irrigated area (ha)	0	0	0	0	207.09	0	207.09

Source: Field Survey, 2007-08

Table 4.21 Irrigation Schemes: Funds for Repair and Maintenance (Rs. Lakh) in Hamirpur District of Himachal Pradesh

Schemes	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Functional							
Lift irrigation							
Number	0	7	0	0	11	8	26
Annual maintenance	0	15	0	0	95	20	130
Replacement/overhauling in 10 yrs	0	90	0	0	200	100	390
Kuhl							
Number	0	5	6	0	0	0	11
Annual maintenance	0	1	9	0	0	0	10
Replacement/overhauling in 10 yrs	0	5	10	0	0	0	15
Tank irrigation							
Number	0	6	0	0	80	0	86
Annual maintenance	0	1	0	0	15	0	16
Replacement/overhauling in 10 yrs	0	3	0	0	22	0	25
Total funds requirement	0	115	19	0	332	120	586

Source: Field Survey, 2007-08

Table 4.22 Varietal and Technological Problems of Cereals, Pulses and Oilseed Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crops	Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Cereals								
Maize								
1	Poor quality seed	40.00	75.00	50.00	50.00	60.00	50.00	53.57
2	Emergence of weeds (<i>Commelina benghalensis</i> , <i>Echinochloa colona</i> , <i>Ageratum</i> <i>conyzoides</i> , <i>Cyperus rotundus</i> , <i>Dactyloctenium aegyptium</i>)	40.00	25.00	50.00	50.00	40.00	50.00	42.86
3	Imbalanced use of fertiliser	60.00	75.00	75.00	66.67	80.00	75.00	71.43
4	Monkey problem	40.00	50.00	50.00	16.67	60.00	75.00	46.43
5	Lack of proper technology	60.00	50.00	75.00	66.67	60.00	50.00	60.71
7	Lodging due to more height	100.00	100.00	100.00	100.00	100.00	100.00	100.00
8	High seed rate	60.00	75.00	50.00	66.67	60.00	75.00	64.29
9	Bacterial stalk rot	20.00	50.00	75.00	50.00	40.00	25.00	42.86
10	Turcicum and maydis leaf blights	60.00	100.00	75.00	83.33	60.00	75.00	75.00
11	Banded leaf and sheath blight	60.00	100.00	75.00	83.33	60.00	75.00	75.00
12	Cutworms, termites white grubs, stem borer	20.00	50.00	50.00	66.67	40.00	25.00	42.86
Paddy								
1	White grubs, leaf folder, grasshopper	20.00	50.00	50.00	50.00	40.00	25.00	39.29
2	Lodging	20.00	50.00	50.00	16.67	20.00	25.00	28.57
3	Emergence of weeds (<i>Echinochloa crus-galli</i> , <i>Cyperus iria</i> , <i>Commelina</i> <i>communis</i> , <i>Panicum</i> <i>dichotomiflorum</i> ., <i>Fimbristylis</i> <i>sp</i>)	60.00	50.00	100.00	50.00	40.00	50.00	57.14
4	Lack of irrigation	60.00	75.00	75.00	66.67	60.00	75.00	67.86
5	Inadequate supply of seeds of improved varieties	40.00	75.00	100.00	50.00	40.00	75.00	60.71
6	Sowing by broadcast method	60.00	100.00	75.00	66.67	60.00	75.00	71.43
7	Brown spot	60.00	50.00	75.00	50.00	40.00	50.00	53.57
8	Grain discolouration	60.00	100.00	75.00	66.67	60.00	100.00	75.00
9	False smut	60.00	100.00	125.00	50.00	80.00	75.00	78.57
Wheat								
1	Weed problem (<i>Medicago denticulate</i> , <i>Anagallis arvensis</i> , <i>Poa annua</i> , <i>Stellaria media</i> , <i>Phalaris minor</i> <i>Avena leudoviciana</i> , <i>Juncus bufonius</i>)	40.00	75.00	75.00	66.67	40.00	75.00	60.71
2	Rusts (yellow & leaf rusts)	40.00	50.00	50.00	50.00	40.00	75.00	50.00
3	Lack of irrigation facilities	80.00	75.00	100.00	83.33	40.00	75.00	75.00
4	Lack of technical know-how	60.00	50.00	75.00	66.67	60.00	50.00	60.71
5	Suitable HYV's not available	40.00	50.00	75.00	50.00	40.00	25.00	46.43
6	Imbalanced use of fertiliser	60.00	75.00	75.00	66.67	80.00	75.00	71.43
7	Low yields	80.00	100.00	100.00	66.67	80.00	100.00	85.71
8	Traditional varieties	0.00	0.00	0.00	0.00	0.00	0.00	0.00

9	Loose smut	60.00	75.00	25.00	50.00	40.00	50.00	50.00
10	Karnal bunt	60.00	50.00	100.00	50.00	60.00	50.00	60.71
11	Termite and grasshopper	60.00	50.00	100.00	50.00	60.00	50.00	60.71
Barley								
1	Less popular among farmers	20.00	50.00	75.00	66.67	60.00	75.00	57.14
2	Grown for animal feed	80.00	75.00	100.00	83.33	80.00	100.00	85.71
3	Non- availability of market	40.00	50.00	25.00	16.67	40.00	25.00	32.14
Pulses								
Mash								
1	Local variety	40.00	50.00	25.00	33.33	20.00	25.00	32.14
2	Cultivated on marginal land	80.00	75.00	100.00	83.33	80.00	75.00	82.14
3	Leaf spots	20.00	50.00	50.00	16.67	40.00	25.00	32.14
Gram								
1	Local variety	40.00	50.00	25.00	33.33	20.00	25.00	32.14
2	Root rot and stem rot	40.00	50.00	75.00	50.00	40.00	25.00	46.43
3	Gram pod borer insect attack on large scale	80.00	75.00	75.00	66.67	80.00	75.00	75.00
Lentil								
1	Local variety	20.00	25.00	25.00	16.67	20.00	25.00	21.43
2	Cultivated on marginal land	80.00	75.00	75.00	66.67	80.00	100.00	78.57
Oil seeds								
Sarson								
1	Traditional varieties and imbalanced fertilization	40.00	25.00	50.00	50.00	40.00	75.00	46.43
2	Lack of HYV's of the oilseeds	20.00	50.00	75.00	50.00	40.00	50.00	46.43
3	Insect-pest attack (aphid complex, painted bug, cabbage caterpillar)	80.00	75.00	100.00	83.33	60.00	75.00	78.57
4	Lack of technical knowledge	40.00	50.00	75.00	50.00	40.00	75.00	53.57
5	Lack of irrigation	80.00	100.00	125.00	83.33	80.00	100.00	92.86
6	Imbalanced use of fertiliser	60.00	75.00	75.00	66.67	80.00	75.00	71.43
7	White rust	20.00	50.00	75.00	50.00	40.00	75.00	50.00
8	Weeds (<i>Ranunculus arvensis</i> , <i>Phalaris minor</i> , <i>Polypogon monspensis</i> , <i>Melilotus alba</i> , <i>Anagallis arvensis</i>)	20.00	50.00	25.00	33.33	60.00	25.00	35.71
9	Downy mildew	40.00	25.00	50.00	50.00	40.00	50.00	42.86
Toria								
1	Traditional varieties and imbalanced fertilization	40.00	50.00	25.00	50.00	40.00	75.00	46.43
2	Lack of HYVs of the toria	20.00	50.00	25.00	50.00	40.00	50.00	39.29
3	Insect-pest attack ((aphid complex, painted bug, cabbage caterpillar)	20.00	50.00	25.00	33.33	20.00	25.00	28.57
4	Lack of technical knowledge	40.00	50.00	75.00	66.67	60.00	50.00	57.14
5	Lack of irrigation	60.00	100.00	75.00	66.67	60.00	75.00	71.43
6	Imbalanced use of fertiliser	60.00	75.00	75.00	66.67	80.00	75.00	71.43

Source: Field Survey, 2007-08

Table 4.23 Technological Interventions in Cereal, Pulse and Oilseed Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crops	Interventions	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Cereals								
Maize								
1	Introduction of improved varieties	80.00	75.00	75.00	83.33	80.00	75.00	78.57
2	Provision of weedicides	40.00	50.00	75.00	50.00	60.00	50.00	53.57
3	INM	20.00	50.00	50.00	33.33	20.00	50.00	35.71
5	Awareness programme	60.00	75.00	75.00	83.33	80.00	75.00	75.00
6	Provision of irrigation facility	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Provision of extension services	40.00	75.00	50.00	50.00	40.00	50.00	50.00
Paddy								
1	Provision of extension services	20.00	50.00	75.00	66.67	40.00	75.00	53.57
2	Irrigation facilities needed	20.00	50.00	50.00	33.33	40.00	50.00	39.29
3	Training programmes	40.00	75.00	50.00	50.00	40.00	75.00	53.57
Wheat								
1	Isoproturon availability	40.00	50.00	75.00	33.33	60.00	50.00	50.00
2	Adequate seed supply of HYV's and recommended fertilizers	60.00	50.00	75.00	66.67	100.00	100.00	75.00
3	Irrigation facilities needed	20.00	25.00	25.00	16.67	20.00	25.00	21.43
4	Awareness programmes	20.00	50.00	75.00	33.33	40.00	25.00	39.29
5	Provision of extension services	40.00	50.00	75.00	33.33	40.00	50.00	46.43
Barley								
1	Provision of market for produce	20.00	25.00	25.00	16.67	20.00	25.00	21.43
Pulses								
Mash								
1	Supply of good quality seed	20.00	50.00	50.00	33.33	20.00	25.00	32.14
2	Training and demonstration programmes	40.00	50.00	75.00	33.33	40.00	50.00	46.43

Gram								
1	Supply of good quality seed	60.00	50.00	25.00	33.33	40.00	25.00	39.29
2	Training and demonstration programmes	40.00	50.00	25.00	66.67	20.00	50.00	42.86
Lentil								
1	Supply of good quality seed	20.00	50.00	75.00	66.67	40.00	50.00	50.00
Oilseeds		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sarson								
1	Supply of good quality seed	40.00	50.00	75.00	66.67	40.00	50.00	53.57
2	Training and demonstration programmes	60.00	50.00	75.00	66.67	60.00	50.00	60.71
Toria								
	Training and demonstration programmes	60.00	50.00	50.00	66.67	40.00	25.00	50.00

Source: Field Survey, 2007-08

Table 4.24 Varietal and Technological Problems of Vegetable and Spice Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Sr.No.	Vegetable/ Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
	Potato							
1	Poor quality seed	60.00	50.00	75.00	66.67	40.00	50.00	57.14
2	Unknown varieties are used	100.00	100.00	75.00	50.00	60.00	50.00	71.43
3	Disease attack	100.00	100.00	75.00	50.00	60.00	50.00	71.43
4	Lack of technical know-how	80.00	75.00	50.00	83.33	80.00	75.00	75.00
5	Rat problem	60.00	50.00	25.00	50.00	40.00	75.00	50.00
6	Insect-pest attack (hadda beetle, aphids, wire worms,	40.00	50.00	50.00	50.00	40.00	25.00	42.86
7	Imbalanced use of fertilizers	80.00	75.00	75.00	50.00	60.00	75.00	67.86
8	Weed problem (<i>Poa annua</i> , <i>Stellaria media</i> , <i>Oxalis latifolia</i>)	80.00	75.00	75.00	50.00	60.00	75.00	67.86
9	Lack of marketing facilities	20.00	50.00	25.00	33.33	40.00	25.00	32.14
	Tomato							
1	Disease attack	40.00	75.00	50.00	66.67	60.00	75.00	60.71
2	Insect-pest attack (tomato fruit borer, nematodes, cutworm, hadda beetle, fruit fly)	60.00	75.00	75.00	66.67	60.00	50.00	64.29
3	Poor quality seed	20.00	25.00	25.00	16.67	20.00	25.00	21.43
4	Local cultivars and imbalanced fertilizer application	80.00	75.00	75.00	66.67	40.00	75.00	67.86
5	Improper spacing	60.00	75.00	100.00	33.33	60.00	75.00	64.29
6	Poor fruit set	20.00	50.00	75.00	66.67	40.00	25.00	46.43
7	Costly seed	80.00	100.00	125.00	50.00	40.00	50.00	71.43
	Peas							
1	Poor pod set	40.00	75.00	50.00	33.33	60.00	50.00	50.00
2	Imbalanced use of fertilizers and lack of irrigation facilities	60.00	50.00	75.00	83.33	40.00	75.00	64.29
3	Root rot and stem rot	20.00	50.00	75.00	33.33	60.00	50.00	46.43
4	Poor management of diseases and pest	40.00	75.00	100.00	66.67	60.00	75.00	67.86
5	Use of traditional varieties	20.00	25.00	50.00	16.67	20.00	25.00	25.00
6	Bird attack	20.00	50.00	25.00	33.33	20.00	25.00	28.57
7	Poor cultural practices	60.00	50.00	75.00	66.67	40.00	50.00	57.14
8	Frost problem	40.00	50.00	75.00	33.33	20.00	50.00	42.86
9	White rot	60.00	75.00	75.00	83.33	60.00	75.00	71.43

10	Insect pest (bean bug, pod borer, pea leaf miner)	60.00	100.00	75.00	66.67	60.00	0.00	60.71
	Cabbage							
1	Poor pest (caterpillar complex, aphid complex, cut worms, flea beetle)	20.00	25.00	50.00	16.67	40.00	25.00	28.57
2	Head compactness	20.00	50.00	50.00	33.33	20.00	50.00	35.71
3	Prevalence of traditional varieties	20.00	25.00	25.00	16.67	20.00	25.00	21.43
4	Imbalanced use of fertilizers	80.00	75.00	75.00	50.00	60.00	75.00	67.86
5	Cultivation on small scale	80.00	100.00	100.00	83.33	100.00	100.00	92.86
6	Disease attack	20.00	25.00	25.00	16.67	20.00	25.00	21.43
7	Insect-pest attack	20.00	25.00	25.00	16.67	20.00	25.00	21.43
	Cauliflower							
1	Insect-pest attack (caterpillar complex, aphid complex, cut worms, flea beetle)	20.00	25.00	50.00	16.67	40.00	25.00	28.57
2	Poor pest and disease management	40.00	25.00	50.00	33.33	20.00	50.00	35.71
3	Use of traditional varieties	20.00	25.00	25.00	16.67	20.00	25.00	21.43
4	Imbalanced use of fertilizers	80.00	75.00	75.00	50.00	60.00	75.00	67.86
5	Cultivation on small scale	80.00	75.00	75.00	83.33	40.00	75.00	71.43
6	Disease problems	20.00	25.00	25.00	16.67	20.00	25.00	21.43
	Capsicum							
1	Flower drop	60.00	75.00	75.00	66.67	60.00	75.00	67.86
2	Disease problems	60.00	75.00	75.00	66.67	60.00	75.00	67.86
3	Insect-pest (aphids, mite, thrips, fruit bud borer, tobacco caterpillar)	60.00	75.00	75.00	66.67	60.00	75.00	67.86
	Colocassia							
	Disease in rainy season (leaf rot)	100.00	100.00	75.00	83.33	100.00	100.00	92.86
	Spices							
	Garlic							
1	Low yield and non availability of HYVs	20.00	50.00	50.00	50.00	40.00	50.00	42.86
2	Imbalanced use of fertilizers	80.00	75.00	75.00	83.33	60.00	100.00	78.57
3	Local cultivars	40.00	75.00	50.00	50.00	40.00	75.00	53.57
4	Disease problem	20.00	50.00	25.00	33.33	20.00	25.00	28.57
	Ginger	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	Rhizome rot	60.00	100.00	75.00	66.67	60.00	75.00	71.43
2	Quality seed not available	20.00	50.00	75.00	33.33	40.00	50.00	42.86
3	Imbalanced fertilizer application	80.00	75.00	75.00	83.33	60.00	100.00	78.57
4	No seed treatment	40.00	75.00	50.00	50.00	40.00	75.00	53.57

Source: Field Survey, 2007-08

Table 4.25 Technological Interventions in Vegetable and Spice Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crops	Intervention	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Vegetable								
Potato								
1	Supply of good quality seeds	60.00	50.00	75.00	50.00	80.00	75.00	64.29
2	Awareness programmes	80.00	75.00	50.00	83.33	60.00	50.00	67.86
3	Supply of suitable weedicides	60.00	50.00	75.00	66.67	40.00	75.00	60.71
4	Effective extension services	40.00	50.00	75.00	66.67	40.00	75.00	57.14
5	Supply of plant protection materials	60.00	75.00	50.00	50.00	80.00	50.00	60.71
6	Marketing facilities	80.00	75.00	75.00	83.33	80.00	100.00	82.14
Tomato								
1	Irrigation facility	60.00	50.00	75.00	33.33	40.00	50.00	50.00
2	Effective extension services	40.00	50.00	75.00	66.67	60.00	50.00	57.14
3	Supply of hybrid seeds like Naveen	100.00	100.00	75.00	83.33	80.00	75.00	85.71
4	Awareness programmes	60.00	75.00	75.00	66.67	60.00	50.00	64.29
Peas								
1	Supply of quality seeds like Azad P-1, Lincoln	20.00	50.00	50.00	50.00	40.00	25.00	39.29
2	Awareness programmes	60.00	50.00	50.00	50.00	40.00	50.00	50.00
3	Provision of irrigation	40.00	75.00	50.00	33.33	40.00	25.00	42.86
4	Effective extension services	40.00	50.00	75.00	66.67	60.00	50.00	57.14
Cabbage								
1	Awareness programmes	40.00	75.00	50.00	50.00	60.00	75.00	57.14
2	Irrigation facility	40.00	75.00	50.00	33.33	40.00	25.00	42.86
3	Effective extension services	40.00	50.00	75.00	66.67	60.00	50.00	57.14
Cauliflower								
1	Irrigation facility	40.00	75.00	50.00	33.33	40.00	25.00	42.86
2	Effective extension services	40.00	50.00	75.00	66.67	60.00	50.00	57.14
Colocasia								
1	Vocational training	60.00	50.00	75.00	50.00	40.00	75.00	57.14
Spices								
Garlic								
1	Awareness programmes	40.00	75.00	50.00	50.00	40.00	50.00	50.00
2	Availability of seed	20.00	50.00	25.00	33.33	20.00	25.00	28.57
Ginger								
1	Disease free seed	60.00	75.00	50.00	83.33	80.00	75.00	71.43
2	Quality seed availability	60.00	75.00	75.00	66.67	60.00	50.00	64.29
3	Awareness programmes	60.00	75.00	100.00	50.00	60.00	50.00	64.29
4	Demonstration	60.00	75.00	50.00	66.67	60.00	50.00	60.71

Source: Field Survey, 2007-08

Table 4.26 Varietal and Technological Problems of Other Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crops	Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Sugarcane								
1	Poor yield	0.00	0.00	0.00	16.67	20.00	0.00	7.14
Floriculture								
1	Poly-house is not available	60.00	100.00	75.00	83.33	60.00	75.00	75.00
2	Non-availability of proper storage schedule	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3	Non-availability of proper package of practices	60.00	75.00	100.00	50.00	40.00	50.00	60.71
4	Diseases in poly-house	40.00	50.00	75.00	50.00	40.00	50.00	50.00
5	Problems under protected cultivation	20.00	50.00	25.00	33.33	40.00	50.00	35.71
6	Lack of technical knowledge	40.00	75.00	50.00	50.00	40.00	25.00	46.43
7	Insect pest and disease attack	60.00	50.00	75.00	33.33	60.00	50.00	53.57
8	Lack of marketing facilities	80.00	75.00	75.00	66.67	40.00	75.00	67.86

Source: Field Survey, 2007-08

Table 4.27 Technological Interventions in Other Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh

Crops	Interventions	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Sugarcane								
	Introduction of improved variety with good yield	0.00	0.00	0.00	16.67	20.00	0.00	7.14
Floriculture								
	Awareness programmes	80.00	75.00	75.00	50.00	40.00	75.00	64.29

Source: Field Survey, 2007-08

Table 4.28 Extension Yield Gaps in Cereal Crops (Q/ha) in Hamirpur District of Himachal Pradesh

Sr. No.	Crop/Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhar	Sujanpur
Cereal							
Maize							
1	Experiment station yield	57.00	57.00	57.00	57.00	57.00	57.00
2	Progressive farmer's yield	32.15	28.55	29.43	29.10	30.64	23.15
3	Actual/average yield	26.64	24.58	25.41	21.50	23.96	16.64
4	Gaps						
	Gap I (1-3)	30.36	32.42	31.59	35.50	33.04	40.36
	Gap II (2-3)	5.51	3.97	4.02	7.60	6.68	6.51
Paddy							
1	Experiment station yield	40.00	40.00	40.00	40.00	40.00	40.00
2	Progressive farmer's yield	22.63	26.11	27.64	28.10	21.89	21.80
3	Actual/average yield	16.15	15.96	22.78	23.12	17.45	15.81
4	Gaps						
	Gap I (1-3)	23.85	24.04	17.22	16.88	22.55	24.19
	Gap II (2-3)	6.48	10.15	4.86	4.98	4.44	5.99
Wheat							
1	Experiment station yield	35.00	35.00	35.00	35.00	35.00	35.00
2	Progressive farmer's yield	22.11	23.10	23.25	26.75	21.25	23.21
3	Actual/average yield	15.12	16.10	17.65	18.25	14.90	16.78
4	Gaps						
	Gap I (1-3)	19.88	18.90	17.35	16.75	20.10	18.22
	Gap II (2-3)	6.99	7.00	5.60	8.50	6.35	6.43
Barley							
1	Experiment station yield	25.00	25.00	25.00	25.00	25.00	25.00
2	Progressive farmer's yield	13.65	14.32	19.75	22.15	18.10	15.80
3	Actual/average yield	8.90	10.46	12.28	14.96	11.35	11.20
4	Gaps						
	Gap I (1-3)	16.10	14.54	12.72	10.04	13.65	13.80
	Gap II (2-3)	4.75	3.86	7.47	7.19	6.75	4.60

Source: (i) Package and Practices for Kharif, Rabi and Vegetable Crops, Directorate of Extension Education, CSK HPKV, Palampur
(ii) Field Survey, 2007-08

Table 4.29 Extension Yield Gaps in Pulse and Oilseed Crops (Q/ha) in Hamirpur District of Himachal Pradesh

Sr. No.	Crop/Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur
Pulses							
Mash							
1	Experiment station yield	12.00	12.00	12.00	12.00	12.00	12.00
2	Progressive farmer's yield	7.81	8.10	7.43	8.17	6.98	7.56
3	Actual/average yield	4.10	4.30	4.45	5.10	5.10	5.69
4	Gaps						
	Gap I (1-3)	7.90	7.70	7.55	6.90	6.90	6.31
	Gap II (2-3)	3.71	3.80	2.98	3.07	1.88	1.87
Gram							
1	Experiment station yield	10.00	10.00	10.00	10.00	10.00	10.00
2	Progressive farmer's yield	11.25	9.55	10.08	11.63	10.54	9.63
3	Actual/average yield	5.66	6.89	6.55	7.14	6.87	7.55
4	Gaps						
	Gap I (1-3)	4.34	3.11	3.45	2.86	3.13	2.45
	Gap II (2-3)	5.59	2.66	3.53	4.49	3.67	2.08
Lentil							
1	Experiment station yield	14.00	14.00	14.00	14.00	14.00	14.00
2	Progressive farmer's yield	5.54	6.14	5.96	6.35	5.8	6.11
3	Actual/average yield	3.42	3.47	3.43	5.11	4.94	4.65
4	Gaps						
	Gap I (1-3)	10.58	10.53	10.57	8.89	9.06	9.35
	Gap II (2-3)	2.12	2.67	2.53	1.24	0.86	1.46
Oil seed							
Sesame							
1	Experiment station yield	8.00	8.00	8.00	8.00	8.00	8.00
2	Progressive farmer's yield	4.50	3.60	3.55	3.10	3.65	3.75
3	Actual/average yield	2.98	3.10	2.10	2.27	2.55	2.8
4	Gaps						
	Gap I (1-3)	5.02	4.90	5.90	5.73	5.45	5.20
	Gap II (2-3)	1.52	0.50	1.45	0.83	1.10	0.95
Sarson							
1	Experiment station yield	10.00	10.00	10.00	10.00	10.00	10.00
2	Progressive farmer's yield	6.15	7.96	6.11	8.12	6.90	6.25
3	Actual/average yield	4.10	4.78	4.15	6.32	5.53	4.33

4	Gaps						
	Gap I (1-3)	5.90	5.22	5.85	3.68	4.47	5.67
	Gap II (2-3)	2.05	3.18	1.96	1.80	1.37	1.92
Toria							
1	Experiment station yield	8.00	8.00	8.00	8.00	8.00	8.00
2	Progressive farmer's yield	5.65	7.14	6.50	9.25	7.10	7.23
3	Actual/average yield	3.63	6.11	4.47	5.90	6.12	5.96
4	Gaps						
	Gap I (1-3)	4.37	1.89	3.53	2.10	1.88	2.04
	Gap II (2-3)	2.02	1.03	2.03	3.35	0.98	1.27
Gobhi sarson							
1	Experiment station yield	15.00	15.00	15.00	15.00	15.00	15.00
2	Progressive farmer's yield	7.80	8.10	7.50	12.54	8.66	8.45
3	Actual/average yield	5.34	5.42	6.10	7.49	7.17	6.55
4	Gaps						
	Gap I (1-3)	9.66	9.58	8.90	7.51	7.83	8.45
	Gap II (2-3)	2.46	2.68	1.40	5.05	1.49	1.90

Source: (i) Package and Practices for Kharif, Rabi and Vegetable Crops, Directorate of Extension Education, CSK HPKV, Palampur
(ii) Field Survey, 2007-08

Table 4.30 Extension yield Gaps in Vegetable and Spice Crops (Q/ha)

Sr No.	Crop/Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur
Vegetable							
Tomato							
1	Experiment station yield	500.00	500.00	500.00	500.00	500.00	500.00
2	Progressive farmer's yield	340.00	325.00	370.00	395.00	326.00	303.00
3	Actual/average yield	264.00	278.00	298.00	345.00	276.00	230.00
4	Gaps						
	Gap I (1-3)	236.00	222.00	202.00	155.00	224.00	270.00
	Gap II (2-3)	76.00	47.00	72.00	50.00	50.00	73.00
Peas							
1	Experiment station yield	125.00	125.00	125.00	125.00	125.00	125.00
2	Progressive farmer's yield	95.00	115.00	98.00	125.00	95.00	82.00
3	Actual/average yield	62.00	85.00	76.00	100.00	67.00	58.00
4	Gaps						
	Gap I (1-3)	63.00	40.00	49.00	25.00	58.00	67.00
	Gap II (2-3)	33.00	30.00	22.00	25.00	28.00	24.00
Okra							
1	Experiment station yield	140.00	140.00	140.00	140.00	140.00	140.00
2	Progressive farmer's yield	75.00	81.00	98.00	109.00	89.00	84.00
3	Actual/average yield	57.00	66.00	73.00	91.00	68.00	61.00
4	Gaps						
	Gap I (1-3)	83.00	74.00	67.00	49.00	72.00	79.00
	Gap II (2-3)	18.00	15.00	25.00	18.00	21.00	23.00
Cucumber							
1	Experiment station yield	190.00	190.00	190.00	190.00	190.00	190.00
2	Progressive farmer's yield	195.00	210.00	180.00	235.00	208.00	198.00
3	Actual/average yield	150.00	170.00	146.00	205.00	159.00	152.00
4	Gaps						
	Gap I (1-3)	40.00	20.00	44.00	-15.00	31.00	38.00
	Gap II (2-3)	45.00	40.00	34.00	30.00	49.00	46.00
Bottle gourd							
1	Experiment station yield	150.00	150.00	150.00	150.00	150.00	150.00
2	Progressive farmer's yield	215.00	235.00	256.00	275.00	226.00	235.00
3	Actual/average yield	164.00	198.00	210.00	232.00	176.00	188.00
4	Gaps						
	Gap I (1-3)	-14.00	-48.00	-60.00	-82.00	-26.00	-38.00
	Gap II (2-3)	51.00	37.00	46.00	43.00	50.00	47.00
Brinjal							
1	Experiment station yield	125.00	125.00	125.00	125.00	125.00	125.00
2	Progressive farmer's yield	228.00	236.00	218.00	255.00	245.00	231.00
3	Actual/average yield	168.00	195.00	150.00	211.00	173.00	173.00
4	Gaps						
	Gap I (1-3)	-43.00	-70.00	-25.00	-86.00	-48.00	-48.00
	Gap II (2-3)	60.00	41.00	68.00	44.00	72.00	58.00
Capsicum							

1	Experiment station yield	140.00	140.00	140.00	140.00	140.00	140.00
2	Progressive farmer's yield	198.00	238.00	234.00	284.00	210.00	202.00
3	Actual/average yield	164.00	206.00	188.00	258.00	164.00	157.00
4	Gaps						
	Gap I (1-3)	-24.00	-66.00	-48.00	-118.00	-24.00	-17.00
	Gap II (2-3)	34.00	32.00	46.00	26.00	46.00	45.00
Cauliflower							
1	Experiment station yield	250.00	250.00	250.00	250.00	250.00	250.00
2	Progressive farmer's yield	145.00	175.00	160.00	217.00	185.00	167.00
3	Actual/average yield	102.00	152.00	98.00	189.00	127.00	108.00
4	Gaps						
	Gap I (1-3)	148.00	98.00	152.00	61.00	123.00	142.00
	Gap II (2-3)	43.00	23.00	62.00	28.00	58.00	59.00
Colocasia							
1	Experiment station yield	190.00	190.00	190.00	190.00	190.00	190.00
2	Progressive farmer's yield	147.00	168.00	189.00	205.00	184.00	187.00
3	Actual/average yield	82.00	107.00	106.00	154.00	97.00	107.00
4	Gaps						
	Gap I (1-3)	108.00	83.00	84.00	36.00	93.00	83.00
	Gap II (2-3)	65.00	61.00	83.00	51.00	87.00	80.00
Onion							
1	Experiment station yield	250.00	250.00	250.00	250.00	250.00	250.00
2	Progressive farmer's yield	133.00	225.00	152.00	180.00	158.00	153.00
3	Actual/average yield	68.00	186.00	83.00	138.00	83.00	79.00
4	Gaps						
	Gap I (1-3)	182.00	64.00	167.00	112.00	167.00	171.00
	Gap II (2-3)	65.00	39.00	69.00	42.00	75.00	74.00
Spices							
Ginger							
1	Experiment station yield	150.00	150.00	150.00	150.00	150.00	150.00
2	Progressive farmer's yield	89.00	105.00	108.00	134.00	114.00	117.00
3	Actual/average yield	47.00	73.00	55.00	103.00	53.00	57.00
4	Gaps						
	Gap I (1-3)	103.00	77.00	95.00	47.00	97.00	93.00
	Gap II (2-3)	42.00	32.00	53.00	31.00	61.00	60.00
Garlic							
1	Experiment station yield	150.00	150.00	150.00	150.00	150.00	150.00
2	Progressive farmer's yield	122.00	129.00	119.00	145.00	124.00	131.00
3	Actual/average yield	89.00	104.00	84.00	121.00	77.00	83.00
4	Gaps						
	Gap I (1-3)	61.00	46.00	66.00	29.00	73.00	67.00
	Gap II (2-3)	33.00	25.00	35.00	24.00	47.00	48.00

Source: (i) Package and Practices for Kharif, Rabi and Vegetable Crops, Directorate of Extension Education, CSK HPKV, Palampur
(ii) Field Survey, 2007-08

Chapter-V

ALLIED AGRICULTURAL SECTORS

Agricultural sector in broader sense covers agriculture, horticulture, animal husbandry, sericulture, fisheries and other allied enterprises such as mushroom production, bee keeping and poultry etc. The farming systems of hilly regions are mixed and subsistence in nature which have emerged over the period as per the basic household needs of the rural households and market potentials. Traditionally, agriculture, horticulture and animal husbandry are the major components of the farming systems of district Hamirpur. Due to the implementation of different agricultural schemes/projects by different developmental departments, the farming community of the district is introducing mushroom production, poultry, bee keeping, fisheries and sericulture in their farming systems. The growth of agriculture as a whole is around 2 per cent which is mainly due to the fact that good proportion of cultivated land is allocated for the production of food grains in which the growth of productivity levels is slow. On the other hand, the horticulture crops like fruit and vegetables have 4-5 times higher productivity which shows future potential for achieving the desired growth rate of agriculture sector. The allied sectors such as mushroom production, poultry, bee keeping, protected farming etc; are comparatively less land competitive with other enterprises and generate higher returns in terms of value per unit of time and are becoming popular among the un-employed rural youth for self-employment. Therefore, there is need to develop these enterprises for generating income and employment and thereby increase the overall growth of the agriculture sector beyond 4 per cent per annum. This chapter deals with the analysis of existing status, potential, problems, constraints and interventions required to accelerate the growth of allied enterprises in the district as per existing potential of different blocks.

5.1 Horticulture

Horticulture is also one of the major components of the farming system of the district Hamirpur. District Hamirpur is considered as home of galgal (*Citrus pseudolimon*), seedling mango (*Mangifera indica*) and various other wild fruits besides a number of medicinal and herbal plants. In general, the agro-climatic conditions of the district are suitable for the plantation of mango, citrus, guava, papaya, plum, pomegranate etc. During the survey, it is found that the farmers are maintaining a few fruit plants of mango, guava and citrus either on the field bunds or adjoining to the residential area in order to meet their household needs. At district level, Department of Horticulture is mainly responsible for providing the extension services and providing quality seedlings and related equipments/implements to the farming community through different schemes. The number of existing schemes being implemented in the different blocks of the district, area alongwith population covered under these schemes has been presented in Table 5.1. The table reveals that the Department of Horticulture is implementing four schemes for the promotion of horticultural activities in different blocks of the district and 1,079 villages have been covered with area coverage of 1310 hectares under different activities. Among different blocks of the district, the maximum area coverage was in Bijhari followed by Sujanpur block i.e. 400 and 340 hectares, respectively. The area covered in developmental blocks of Bhoranj and Hamirpur was quite low i.e. 60 and 100 hectares, respectively.

The interaction with officers of department at district level indicates that department is implementing a very prestigious and innovative project i.e. Horticulture Technology Mission Project under which there is provision of capacity building of the farming community and infra-structural development under different components of horticulture. Under this project the farmers are establishing pure orchards of mango, pomegranate, and citrus rather than scanty and scanted plantations. In the district as whole, 40 high tunnel poly house structures (500-1000 sq.m each) and more than 100 low tunnel poly houses for protected cultivation of red and yellow capsicum and quality nursery production of different crops are constructed.

Table 5.2 gives the block wise details of existing and potential status of area, production and number of households growing fruits in the district. The table shows that mango is the major fruit crop of district covering an area of about 2,730 hectares which accounts for the nearly 48 per cent of total area under fruit crops. Among the six blocks of the district, it was highest in Nadaun (737 hectares) followed by Bijhari (658.76 hectares) whereas, it was less than 400 hectares in case of Bhoranj, Hamirpur, Sujanpur and Tauni Devi blocks. The next in major fruit crops of the district is citrus which covers an area of 1,414 hectares. The other fruit crops are guava, papaya, aonla, peach etc. Due to the frequent occurrence of frost and severe damage to the mango, farmers have started diversification in the horticulture sector through the introduction of litchi, pomegranate, orange, mussami, kinnow etc. Nadaun and Bijhari are the leading blocks for fruit production among the different blocks of the district.

The table further indicates that there is great potential for increasing the area under fruit crops. There is a need to strengthen the extension network for the dissemination of latest technology vis-à-vis addressing the researchable issues with respect to frost management and the problem of alternate bearing in case of mango. Due to perishable nature of the horticultural produce, there is need to strengthen the marketing network and promote the post-harvest management and value-addition activities.

5.2 Animal Husbandry

Animal husbandry is considered as most important component of the farming system in the district as it provides regular income and employment to the rural households as well. It contributes to the sustainability of farming systems through the production of Farm Yard Manure (FYM). Every household has the practice to rear at least one or more animals depending on its size of holding and day to day requirement of milk and milk products and FYM for agricultural crops. A few farmers of the district who are situated near small town also rear livestock for commercial purposes i.e sale of milk and livestock as the major source of their household income. The details of different schemes implemented by the Department of Animal Husbandry in district Hamipur has been given in Table 5.3. The table indicates that the department is implementing 5 schemes in six developmental blocks of the district in which 350 villages and 2,400 farm families have been benefited. The coverage of block is found good in Hamirpur and Sujanpur blocks in which 70 and 53 villages were covered respectively, whereas in development block Naduan the benefit of these schemes was realized only in 25 villages.

Table 5.4 presents the block wise livestock statistics for the district. The total live stock population in the district is 2,03,896 in which the share of buffaloes is above 50 per cent. As far

as the milch animals (cows and buffaloes) are concerned, about 89 per cent are buffaloes. During the survey, it is found that although the cross bred cows are more productive and fodder requirement is also less yet farmers prefer to rear buffaloes due to high percentage of fat content, taste and colour of the milk. It is also reported that it is very difficult to find the buyer for cow's milk in the local area or even in the market. The percentage of crossbred cows in the district is around 5 per cent of the total population. Among different blocks, the overall livestock population is more in Nadaun (45800) followed by Bijhari (38014) and Tauni Devi (37808). In order to increase the milk production, there is need to popularise the rearing of crossbred cows through the awareness programmes by reducing ill myths of households about the quality of milk. Similarly, the local breeds of buffaloes require improvement or Murrah breed has the higher milk production potential than existing breeds. At present, the poultry population statistics in the district are not encouraging and present scope for self-employment avenues for the educated rural youth.

5.3. Fisheries

District Hamirpur is deprived of existence of big lakes and major river passing across the district which is the requisite for the promotion of fisheries. Among the major rivers of the state only Beas river touches the boundaries of the district near development blocks of Sujampur and Nadaun. Therefore, the scopes/ potential are very limited. But the district has some tributaries like Bakar Khad, Kunha Khad and Man Khad which drain into river Beas, while Sukar Khad and Mundkhar Khad drain into Seer Khad which ultimately mingles into the river Satluj. On the different tributaries of major Khads, the Department of Agriculture and District Rural development Agency (DRDA) Hamiupur and Forest Department have implemented different watershed development programmes in which more than 100 water harvesting structures have been constructed during the last few years. The Department of Fisheries has issued licences to the fishermen for promoting the cultured fisheries under the two departmental schemes (Table 4.5) The table shows that in district Hamirpur, department has covered 53 villages and benefited a population of 1,704 individuals comprising of 371 families. In terms of area and villages covered, the maximum coverage is given to block Hamirpur followed by Sujampur. The information on the existing status, potential fish species and diseases of cultured fisheries in different blocks of the district has been presented Table 5.6. The table reveals that the existing and potential status of cultured fisheries is good in development blocks of Nadaun, Hamirpur and Sujampur where 96, 86 and 82 households, respectively are associated in the cultured fishery activities. As far as production is concerned, Sujampur is better-off than other blocks of the district. The cultured fisheries activities are not much popular in Tauni Devi and Bijhari blocks of the district. This may be due to the lack of sufficient perennial water resources. The major fish species popular in the district are common carp, rohu and calta in the existing situation, but potential also exists for mrigal, silver carp and grass carp fish in different blocks of the district. The table further indicated that the fingerlings rot and fungal diseases are two major diseases affecting the cultured fish production which needs to be addressed with suitable extension and research interventions. The fishermen associated with cultured fisheries in all blocks have number of constraints which affect the fish production are summarised in Table 5.7. The table reveals that lack of availability of quality fingerlings, fish feed, quality and quantity of water, lack of technical know-how, perishability and lack of remunerative prices etc; are the major constraints faced by the fishermen. Quality of fingerlings and fish feed are the two factors which

have direct relation to production and these can be looked into by the department by ensuring the supply of quality fingerlings and feed under departmental setup or through promoting NGOs. However, to upgrade the technical skills, fishermen need to be trained at appropriate places through practical demonstration on different aspects of the cultured fisheries.

5.4 Marketing of Agricultural Produce

As discussed in Chapter IV, maize and wheat are the major crops of district in terms of their share in the total cropped area. Only around 5 per cent of net area sown has the assured irrigation facilities due to which the productivity of *Rabi* crops i.e wheat is low and production is generally sufficient only to meet the households' consumption needs.

On the other hand *Kharif* season receives good quantum of rainfall and the natural drainage system is good which favours good production of maize crop in the district. It is reported by the respondents that the consumption of maize at household level has decreased during recent years and productivity of maize has increased due the adoption of dwarf and lodging resistant hybrid varieties. Hence, the marketable surplus of maize has increased. The details of marketing of agriculture produce have been studied and have been presented in Table 5.8. It can be seen from the table that in case of cereal crops, the marketed surplus and post harvest losses are estimated at 35,670 and 2,344 tonnes respectively, which are around 26 and 1.70 per cent of the total production of cereals in the district. The major portion of the marketed surplus of cereals i.e more than 65 per cent is sold in distant markets and remaining quantity is sold in local area (about 20 per cent) and within the district (about 11 per cent). The marketed surplus in case of pulses is around 11 per cent of the total production and across the blocks of the district it is more than 10 per cent in case of Hamirpur and Nadaun blocks whereas it is less than 10 per cent of total production for other four blocks of the district. There is no marketed surplus in case of oilseed crops. The entire production is consumed at household level in all the developmental blocks of the district.

The table further reveals that vegetables have primarily been produced for the market and only about 2 per cent of the total production is consumed at home and 13 per cent is wasted during post harvest operations. It is found that about 89 per cent of the marketed surplus is disposed of in the distant markets within the district either in the main market yard at Hamirpur or at market sub-yard at Nadaun. About 8 per cent of the marketed surplus of vegetables is sent to distant markets i.e. Punjab area by Nadaun and Bijhari block farmers. The marketed surplus of vegetables sold within the local area is less than 5 per cent in all the developmental blocks of the district. It has been observed that the major proportion of the marketed surplus of vegetables is sold within the district at Hamirpur or Nadaun. It is expected that the area under vegetables will increase considerably in the years to come. Therefore, there is a need to upgrade the existing market yards or develop atleast one market sub-yard in each block so that the vegetable produce may be sold easily by the farmers. The efforts for dissemination of market information to the growers should be intensified and the farmers may be motivated to form groups for distant marketing. The marketing of horticultural produce has been presented in Table 5.9. About 11 per cent of the horticultural produce is consumed at home, 13 per cent is wasted in post-harvest operations and about 76 per cent is estimated as marketed surplus in the district. Out of the total marketed surplus, 79 per cent is sold in the distant market within the district whereas 20 per cent is sold in the local markets and about 1 per cent is sent to distant markets.

Production of milk, meat, eggs and marketed surplus for different blocks of the district have been presented in Table 5.10. The table reveals that on average, about 80 per cent of the milk production is used for household consumption and 20 per cent is sold in local area. It is reported by the respondents of different blocks that they rarely sell sheep and goats after slaughtering as meat, but they mostly sell sheep and goats as live animals to the slaughter house owners. The cattle and buffaloes are also being sold and purchased in different blocks of district either locally or within the district.

5.5 Marketing Infrastructure

Marketing infrastructural facilities like collection centres, market yards, co-operative marketing societies and co-operative input societies, etc; play an important role in the selling of agricultural produce and as well as for the purchase of farm inputs. The block wise existing status and actual requirements have been presented in Table 5.11. The table reveals that the status of marketing infra-structure is quite poor, as there are no collection centres in the district in any block. However, there is market yard in Hamirpur block and one market sub-yard in Nadaun. The farmers are in the process of diversifying their cropping systems through the adoption of vegetable crops and horticultural activities under Horticulture Technology Mission. Since the produce is of perishable nature, there is need of collection centres and market yard in each block so that the farmers may sell their produce within their block. Cooperative market societies and PACs exist in the district but their number is less than the actual requirement of different blocks.

The marketing infra-structure for the sale of milk is also weak in the district. It is reported by the respondents that they generally sell milk in the local area/market as fresh milk as there are no facilities for the pasteurization. However, during the survey, it was observed that milk federation had started the collection of fresh milk from the selected areas of the district for further disposal after processing and pasteurization. In this context, the farmers were of the view that the rate of milk offered by milk federation was quite low as compared to local market rates. In the district, there is lack of infra-structural facilities for chilling, pasteurization and packaging in order to increase the self-life of milk. Hence, in order to create/strengthen such facilities at the block level for proper marketing of milk and milk products, Table 5.12 presents the financial estimates for livestock products. The total financial requirement for establishment of facilities like cold storage, chilling plants, refrigerated vans and packaging machine etc; is estimated to the tune of Rs 489.5 lakh for the district as a whole.

5.6 Human Resource Development

As discussed above, the farming is becoming a commercial enterprise in the district through the adoption of cultivation of vegetable crops, protected cultivation (flower & vegetables) and adoption of enterprises like mushroom production, rearing silk worms, fisheries etc. Therefore, in order to address the different issues/problems and timely implementation of different schemes, there is need of adequate and technical human resource. Table 5.14 shows the existing position of technical man power working in the different sub-sectors of agriculture in the district and their actual requirements in six blocks of the district. The perusal of table indicates that at present, there are 229 extension workers working in different line departments as against the sanctioned

strength of 277. The table further indicates that in the exiting set up there is no provision of mushroom, floriculture and fisheries specialists which are urgently needed for the promotion of commercial enterprises. If the plan has to be implemented in true spirit as per the requirement of the farmers, there will be a need of 501 technical experts as against the present status of 229, which means that there is an additional requirement of 272 technical experts. The gaps in different sub-sectors in different blocks need to be filled on priority for which an outlay Rs 2,501 lakh is required for the project period (Table 5.15).

5.7 Unemployment and Enterprises for Livelihood

Unemployment is the burning problem of the country. The extent of unemployment for different blocks of district Hamirpur has been given in Table 5.16. It can be seen from the Table that in district Hamirpur, the total unemployed in different categories are around 55,996 out of which 63 per cent are male and 37 per cent are female. The highest number of unemployed is in Nadaun block followed by Tauni Devi. According to education, the percentage of matriculates was highest (35.86) followed by plus two, whereas the share of unemployed graduates and technicals was estimated at about 9 and 7 per cent, respectively. Similar trend was observed across different blocks of the district.

It was revealed by the respondents that the chances of the employment in the governmental sector are very bleak. Moreover, the educated youth was not interested in traditional farming due to lower and slow rate of returns and its susceptibility to natural calamities. In district Hamirpur, the farmers in different blocks have adopted number of farm and non-farm enterprises for earning their livelihood. The major enterprises adopted by the farmers were atta chakki, oil expeller, nursery raising, processing and value-addition, mushroom production etc; for which the block-wise details have been given in Table 5.17. The table suggests that the small scale industries viz., atta chakki, oil expeller, rice sheller etc; having relevance with agriculture and local demand of the households, have been established by the entrepreneurial farmers who are earning their livelihood. In the recent year new enterprises like nursery production, poultry, mushroom production, protected cultivation, bee keeping, processing and value-addition etc; have become popular among the educated unemployed youths for self employment. With increase in the population and diversification of farming systems, these enterprises need to be promoted as per the potential for absorbing the unemployed youth. Table 5.18 gives the detail of potential enterprises and mandays generation for educated youth. The table further suggests that in order to promote these enterprises among unemployed youth, there is need for training and credit facilities on priority basis.

5.8 Agri-Business Establishments

The status of agri-business establishments like agro-sale centres, primary agricultural co-operative societies, rural handicraft centres, co-operatives and farmers co-operatives in terms of existing and required has been brought out in Table 5.19. The establishment of agro-sale centres and primary agricultural co-operative societies facilitates the supply of inputs like seeds and credit and the formation of farmers' co-operatives promotes the marketing process of agricultural produce at remunerative prices. There is, thus, need to fill up the gaps across the blocks and district as a whole.

5.9 Drudgery of Women

Women folk play a vital role in the management of agriculture and other household chores in Himachal Pradesh. In a money order economy, the males in the district generally perform off-farm activities whereas women look after all the agricultural activities besides household chores. The contribution of women towards crop production operations is generally 50-60 per cent whereas in case of livestock component their contribution is more than 80 per cent. Most of the agricultural operations in the district are done manually except threshing and ploughing by tractor. The work load of agricultural activities carried out manually and by traditional implements is more time consuming and require higher energy. Many women friendly farm implements/equipments are available in the market to ease the work load. Table 5.20 gives the details of agricultural operations and the extent of use of technology for accomplishing these operations with reference to women. The table clearly indicates that in case of crop production activities, the farm operations such as clod breaking, fertilizer and FYM application and intercultural operations are being carried out manually with traditional tools by all the women farmers in the district. Threshing and winnowing were the only major operations executed mechanically by about 94 per cent of the farmers. The major livestock operations such as milking, cutting and fetching of fodder and feeding practices, disposal of animal waste and cleaning of sheds, etc; are mostly performed manually by women. The churning of milk and chaffing of fodder are done with the help of machines by more than 50 per cent of the farmers. The breeding of animals is got done by artificial insemination by 25 per cent of the farmers.

5.10 Livestock Feed and Fodder

For the management of different categories of the livestock, the farmers are feeding grasses and crop residues. The grasses are fed both in green and dry forms as per the availability during the year. The farmers generally feed the livestock with green fodder during the rainy season (July to September) while it is not available during the rest of the year. For supplementing the green fodder during winter and summer months, farmers usually feed tree leaves of *Grewia*, *Bahunia*, and *Bamboo*, etc; and fodder crops like berseem. In addition to fodder, the livestock are fed with concentrates usually during the milking period.

The livestock feeding practices followed for different categories of livestock for different blocks of the district have been presented in Table 5.21 which reveals that the, per day quantity of grasses fed to the livestock was found highest in case of buffaloes followed by crossbred cows. It was estimated at 17.9 and 9.29 kg per day per animal in case of buffaloes for green and dry fodder, respectively. The corresponding figures for crossbred cows were estimated at 14.62 and 8.61 kg, respectively. Almost similar pattern was observed in different blocks of the district. The table further reveals that the quantity of concentrate fed to the milch animals varied between 0.93 kg/per day/animal in case of local cow to 2.25 kg/per day /animal in case of crossbred cows. The poultry were found to be given 60-115 g of the feed/day/bird in different blocks of the district. It was reported by the respondents that there was general scarcity of green fodder during winter and summer months.

5.11 Yield Gaps in Livestock Production

The information regarding the production of milk, eggs and wool for different categories of livestock has been analysed and presented in Table 5.22. It can be seen from the table that among the milch animals, the production of milk was highest in case of crossbred cows followed by buffaloes. It was estimated at around 6 litres in case of cross bred cows and 4 litres in case of buffaloes in the district. Among different blocks of the district, there was a marginal difference in the yield of milk. In general, the milk yield was lower in Tauni Devi block as compared to the other blocks of the district. The table further reveals that there was a huge difference in the average yield of milk and the yield obtained by the progressive farmers of different blocks. The reasons for the gap in yield in different categories of livestock have been analysed and presented in Table 5.23. The table reveals that main reasons for the difference in the yield of the farmers were related to improper feeding practices, imbalanced diet and poor management practices. Therefore, in order to bridge the gap between the yield of the average farmers and that of the progressive ones, the farmers need to be educated regarding the balanced diet and scientific management practices of livestock.

5.12 Incidence of Livestock Diseases

As discussed earlier, the farming community reared the livestock through the traditional practices and housing arrangements were not only unhygienic but also not as per scientific specifications. This leads to the incidence of insects and diseases which affect the health of adult and young stock. During the survey, an attempt was made to identify the major diseases of different categories of livestock and the same have been summarized in Tables 5.24 to Table 5.28. The tables show that among different diseases, the incidence of endoparasites and ectoparasites was much higher as compared to other diseases like foot and mouth, tympany and pneumonia in all the categories of animals. The interventions suggested to mitigate these diseases include vaccination, dipping and dusting of affected animals, organising ectoparasite camps, balance nutrition, etc.

5.13 Yield Gaps in Fruit Crops

The yield gaps in important fruit crops of district Hamirpur have been estimated and brought out in Table 5.29. It can be seen from the table that the average yield of mango, citrus and litchi, was estimated at 6.68 q/ha, 8.96 q/ha and 3.91q/ha, respectively . The yield of progressive farmers of different blocks is quite high as compared to average yield of farmers. This indicates that there exists huge potential to increase the production of fruits in the district. The yield gaps are due to the adoption of different orchard management practices and location specific climatic conditions such as severity of frost and soil depth of areas. The details of various factors responsible for the lower yield of fruit crops have been presented in Table 5.30. The table indicates that in different blocks of the district, incidents of frost and poor orchard management were the major factors for the yield gaps. However, uneconomic size of orchard was also reported as one of the reasons by nearly 50 to 64 per cent of the panchayats. Varietal and technological problems for important fruit crops pointed out by the respondents have been summarised in Table 5.31. It is evident from the table that frost, alternate bearing, glum blotch, improper spacing local cultivars, flower drop

were the major problems in case of mango as reported by the more than 60 per cent of the panchayats. Fruit fly attack was reported as major problem in case of guava. The prevalence of varietal and technological problems in case of litchi, plum and amla was low as compared to mango and guava with almost similar trend in different blocks of the district. The interventions required to address these problems have been worked out through the discussions held with the farmers and extension workers of the horticulture department. Table 5.32 suggests that there was a need to provide training and awareness to the farmers, development of disease and frost resistant and regular bearing varieties. Non-availability of irrigation facilities was reported as one of the major problems, especially in case of litchi in frost prone areas. Varietal and technological problems were reported for main fruit crops which included mango, citrus, litchi, papaya and guava. Sugarcane was grown only in two blocks of the district i.e. Nadaun and Bijhari in which poor yield, non-availability of the suitable high yielding varieties and loss by wild animals were the major problems (Table 5.33). As far as the floriculture was concerned, it was reported that there was non-availability of material for poly-houses, lack of storage facilities, and lack of technical knowledge and lack of marketing facilities in different blocks of the district. Trainings of farmers in the field of floriculture/protected cultivation and provision of incentives and subsidies on the construction of poly-houses were required to be made to promote these enterprises (Table 5.34).

5.14 Sericulture

The soil and climatic conditions in all the six developmental blocks of the district are congenial for the plantation of mulberry plants. The leaves of mulberry are used as basic raw material for rearing of silk worm. The quality of cocoon produced in the district is excellent and comes under grade-A. In district Hamirpur, the department is implementing 4 schemes in all the developmental blocks of the district (Table 5.35). The coverage of villages and households in the district were highest in Nadaun followed by Sujampur. The overall coverage of villages and families in the district was 545 and 3,006, respectively. It was reported by the respondents that the marketing of cocoons was done with help of department of industries where traders from different parts of the country participate in the auction.

5.15 Researchable Issues

In view of previous section, a number of problems/technological issues have emerged which hinder the pace of development of animal husbandry and horticultural sectors. These issues need to be addressed by strengthening the extension network of technology dissemination, governmental policies and through need based research by State Agricultural and Horticultural Universities/their Regional Research stations, sub-stations and KVKs etc. During the survey, number of issues which require the research intervention as reported by the respondents and officers of the line departments were as under:

Animal Husbandry

- Documentation of Ethno-Veterinary Practices (ITK) followed by farmers for testing their scientific validity for replication and mass commutation.

- Studies on routine and immuno-diagnosis of parasitic aetiopathogen causing neonatal diarrhoea and mortality in calves.
- Monkey menace: Socio-biological issues, economic implications and remedial strategy to tackle it
- The stray cattle menace: a technical study into its genesis for its sustainable remedy.
- Studies on the poisonous plants of the district, characterization of their toxic, anti-nutritional factors and easy methods to ameliorate their deleterious effects.
- Strategic mineral supplementation in animals to improve profitability of livestock owners of the district.
- Investigations on the etiological agents of infectious infertility among bovine, ovine and caprine including male animals with special emphasis on *Brucella*, *Chlamydia*, *Mycobacterium* and fungal agents.
- Investigations on the epidemiology and serodiagnosis of *Mycobacterium bovis* infection in bovines.
- To develop endocrinological tools to augment production and reproduction in dairy animals.
- Diagnostic imaging for early and accurate management of surgical afflictions in animals.
- Survey of prevalence of acarine fauna of veterinary importance involved in tick typhus.
- Issues related to animal health problems by livestock farmers of migratory routes used in Hamirpur district
- Development of an Integrated Livestock Production Model (ILPM) in respect of cattle, fish and poultry for farmers of district Hamirpur.
- Refinement in existing fodder preservation techniques.
- Development of a profitable dairy husbandry package for mid-hill livestock farmers in the face of the in-coming 'LIVESTOCK REVOLUTION 2020'.
- Molecular diagnosis and genetic diversity analysis of important pathogens responsible for major animal and poultry diseases and zoonoses in North-West Himalayan region of India.
- Standardization and further application of endoscopic and laproscopic techniques in clinical cases of abdominal disorders in small and large animals.

Horticulture

- Delineation of frost prone areas and recommendation of suitable fruits/varieties for those areas.
- Development of technology for frost management.
- Management of mango mealy bug with emphasis on bio-rational methods

- Development of management strategies for mango malformation and diseases.
- Research on controlling fruit cracks and fruit drop in litchi.
- Development of efficient propagation techniques for litchi, mango, aonla etc.
- Development of techniques for adjusting flowering in fruit crops as per market demands.
- Generation of data base for pollinator diversity in different horticultural crops
- Identification of potential bee keeping belts of the district along with strategies to assure the availability of bee flora.
- Safe waiting period of pesticides on horticultural crops
- The development of regular bearing varieties in case of mango and other fruits
- Development of package of practices for the cultivation of wild and local importance fruits like fig, jamun, reetha (soap nut), bael (wood apple), ber, rubus, kainth, lusura (Cardia mixac) etc
- Development of apple, kiwi and pear fruit varieties with low chilling requirements.
- Identification of niche area and remapping of different fruit growing belts
- Diversification of fruits and their varieties with under utilised fruits
- Development of technology for improving water and fertilizer use efficiency in different fruit crops
- Integrated pest/disease management modules for different fruits grown in the district.
- Integrated nutrient management in mango, citrus, guava, pomegranate, aonla and other fruits.
- Development and finalization of package of recommendation for growing high value cash crops under protected cultivation round the year through utilization of poly houses for zone-I.

Table 5.1 Existing Schemes for Horticulture Development in Hamirpur District of Himachal Pradesh (Block-wise)

Bolock	No. of schemes	Villages Covered (No.)	Population Covered (No.)	Area Covered (Ha)	Beneficiary families (No.)	Satatus	
						Complete (No)	Incomplete (No)
Tauni Devi	4	258	1500	260	312	4	0
Hamirpur	4	109	890	100	180	4	0
Bhoranj	4	133	1088	60	210	4	0
Nadaun	4	115	975	150	175	4	0
Bijhari	4	250	1496	400	288	4	0
Sujanpur	4	214	1668	340	333	4	0
District	4	1079	7617	1310	1498	4	0

Source: Field Survey, 2007-08

Table 5.2 Existing Status and Potential for Horticulture Development (Area in Ha and Production in Mt.) in Hamirpur District of Himachal Pradesh (Block-wise)

Crop	Status	Parameter	Taunidevi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Mango	Existing	Area	296.45	346.59	373.11	737.28	658.76	317.40	2729.59
		Production	198.00	220.80	210.00	640.10	650.00	198.00	2116.90
		No. of Households	7411	7625	7462	13271	13834	4444	54047
	Potential	Area	115	95	150	225	250	90	925
		Production	162.15	156.75	264.45	357.75	346.00	103.14	1390.24
Citrus	Existing	No. of Households	1250	800	1250	1500	1800	750	7350
		Area	161.53	246.56	254.95	231.02	258.67	260.84	1413.57
		Production	144.80	146.00	111.10	142.00	139.80	169.50	853.20
	Potential	No. of Households	2908	5424	5864	6007	7760	5217	33180
		Area	50	75	90	110	170	98	593
Guava	Existing	Production	57.75	77.70	68.22	108.57	128.18	83.89	524.31
		No. of Households	380	600	450	550	800	740	3520
		Area	21.96	9.52	30.1	20	53.6	14.07	149.25
		Production	16.7994	8.14912	27.8425	21.8	46.096	11.9595	132.6465
	Potential	No. of Households	505	238	1054	540	1501	436	4274
Pome granate		Area	10	25	20	20	15	25	115
		Production	10.55	29.08	25.26	26.20	18.75	29.40	139.24
		No. of Households	966	825	621	558	690	755	4415
	Existing	Area	7.92	8.20	13.90	18.84	31.60	13.67	94.13
		Production	3.50	4.50	5.00	8.70	10.00	6.00	37.70
Litchi	Potential	No. of Households	190	180	2947	433	569	492	4811
		Area	75	80	90	80	80	110	515
		Production	42.38	48.96	49.86	51.60	41.20	65.78	299.78
		No. of Households	1250	1405	1356	14110	985	868	19974
	Existing	Area	20.61	63.47	25.95	60.94	48.08	42.39	261.44
Litchi		Production	8.06	32.50	10.77	39.92	22.36	17.63	131.23
		No. of Households	309	1079	415	853	721	593	3970
	Potential	Area	5	10	10	15	5	10	55
		Production	3.625	8.45	7.96	14.475	4.455	7.84	46.805
		No. of Households	50	70	90	100	35	100	445

Amla	Existing	Area	13.43	30.88	19.92	72.09	41.12	38.72	216.16
		Production	6.24	18.84	14.44	62.21	25.70	18.97	146.41
		No. of Households	349	710	339	1730	864	852	4844
	Potential	Area	15	25	35	10	25	15	125
Plum		Production	13.02	19.13	33.39	9.44	23.90	14.25	113.13
		No. of Households	80	198	250	90	150	125	893
	Existing	Area	14.42	39.28	25.12	37.92	9.58	27.36	153.68
		Production	4.00	8.23	5.68	10.85	2.78	6.89	38.43
Peach		No. of Households	418	1021	502	1024	230	684	3879
	Potential	Area	10	15	15	18	20	12	90
		Production	4.25	7.16	7.67	11.02	7.50	6.06	43.58
		No. of Households	400	375	320	480	565	350	2490
Pear	Existing	Area	16.01	14.25	20.59	24.49	19.00	14.71	109.05
		Production	6.19587	6.5265	11.98338	15.20829	9.956	7.19319	57.06323
		No. of Households	432	342	371	612	418	338	2513
	Potential	Area	25	35	40	45	25	25	195
Others		Production	16.13	25.59	32.48	41.45	18.90	14.68	149.21
		No. of Households	450	510	620	875	765	504	3724
	Existing	Area	2.06	10.17	15.41	44.56	30.50	13.70	116.40
		Production	1.96	11.83	14.22	45.58	26.41	11.30	111.31
Others		No. of Households	52	356	385	668	549	301	2311
	Potential	Area	10	20	10	15	15	25	95
		Production	14.12	25.1	11.86	21.375	20.355	31.875	124.685
		No. of Households	280	450	330	375	290	325	2050
Others	Existing	Area	29.49	75.84	102.79	75.89	135.94	43.29	463.23
		Production	11.71	24.65	37.62	31.11	50.71	15.41	171.20
		No. of Households	855	1972	2056	2049	3263	1082	11277
	Potential	Area	30	25	35	20	35	18	163
Others		Production	12.45	13.75	16.63	11.00	15.75	7.65	77.23
		No. of Households	810	755	1002	450	600	375	3992

Source: Field Survey, 2007-08

Table 5.3 Existing Schemes for Livestock Improvement in Hamirpur District of Himachal Pradesh (Block-wise)

Bolock	No. of schemes	Villages Covered (No.)	Population Covered (No.)	Area Covered (Ha)	Beneficiary families (No.)	Satatus	
						Complete (No.)	Incomplete (No.)
Tauni Devi	5	44	2200	0	440	3	2
Hamirpur	5	70	6000	0	629	3	2
Bhoranj	5	31	0	0	296	3	2
Nadaun	5	25	0	0	405	3	2
Bijhari	5	30	975	0	150	3	2
Sujanpur	5	53	0	0	480	3	2
District	5	350	9175	0	2400	3	2

Source: Field Survey, 2007-08

Table 5.4 Livestock Population (No.) in Hamirpur District of Himachal Pradesh (Block-wise)

S. N.	Type of Animal	Status	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
1	Crossbred cows	Male	2045	1794	1022	1186	1517	2437	10001
		Female	1327	1670	1289	2917	2044	1348	10595
2	Local cows	Male	2518	2612	1449	4765	2979	1777	16100
		Female	294	234	67	1008	195	546	2344
3	Total Cattle	Male	4563	4406	2471	5951	4496	4214	26101
		Female	2021	1904	1356	3925	2239	1494	12939
4	Buffaloes	Male	376	365	251	1160	564	258	2974
		Female	16400	16419	12727	25679	23424	6889	101538
5	Goats		5920	4454	4278	4591	4140	6258	29641
6	Sheep	Cross bred	1158	655	876	44	249	901	3883
		Indegenous	3660	3618	2237	1546	230	2737	14028
7	Pack Animal		74	39	93	67	75	42	390
8	Others		3636	1213	809	2837	2597	1310	12402
	Total Livestock		37808	33073	25098	45800	38014	24103	203896
9	Poultry		2954	6253	3618	21602	3777	2375	40579

Source: Field Survey, 2007-08

Table 5.5 Existing Schemes for Fisheries in Hamirpur District of Himachal Pradesh (Block-wise)

Bolock	No. of schemes	Villages covered (No.)	Population covered (No.)	Area covered (Ha)	Beneficiary families (No.)	Satatus	
						Complete (No.)	Incomplete (No.)
Tauni Devi	2	7	146	0.5	33	2	0
Hamirpur	2	12	256	22.2	86	2	0
Bhoranj	3	8	290	3	48	3	0
Nadaun	2	4	475	0.5	96	2	0
Bijhari	2	7	135	1.2	26	2	0
Sujanpur	2	15	402	7.5	82	2	0
District	2	53	1704	34.9	371	2	0

Source: Field Survey, 2007-08

Table 5.6 Cultured Fisheries: Existing Status Potential and Diseases of Fisheries in Hamirpur District of Himachal Pradesh (Block-wise)

Particulars	Households (No.)	Fish prodn. (Q.)	Ponds (No.)	Ponds Area (Ha)	Fish Species							
					Common carp	Rohu	Catla	Mrigal	Grass carp	Silver carp		
Tauni Devi												
Existing	33	41	19	0.5	√	√	---	---	---	---	---	---
Potential	54	55	29	1.5	√	√	√	√	√	√	√	√
Gap	21	14	10	1	---	---	---	---	---	---	---	---
Hamirpur												
Existing	86	46	2	22.2	√	√	---	---	---	---	---	---
Potential	114	58	4	24.4	√	√	√	√	√	√	√	√
Gap	28	12	2	2.2	---	---	---	---	---	---	---	---
Bhoranj												
Existing	48	56	18	3	√	√	---	---	---	---	---	---
Potential	75	70	28	4	√	√	√	√	√	√	√	√
Gap	27	14	10	1	---	---	---	---	---	---	---	---
Nadaun												
Existing	96	156	1	0.5	√	√	---	---	---	---	---	---
Potential	140	190	10	2	√	√	√	√	√	√	√	√
Gap	44	34	9	1.5	---	---	---	---	---	---	---	---
Bijhari												
Existing	26	46	22	1.2	√	√	---	---	---	---	---	---
Potential	50	65	32	2.2	√	√	√	√	√	√	√	√
Gap	24	19	10	1	---	---	---	---	---	---	---	---
Sujanpur												
Existing	82	174	49	7.5	√	√	---	---	---	---	---	---
Potential	125	210	59	8.5	√	√	√	√	√	√	√	√
Gap	43	36	10	1	---	---	---	---	---	---	---	---
District												
Existing	371	519	111	34.9	√	√	---	---	---	---	---	---
Potential	558	648	162	42.6	√	√	√	√	√	√	√	√
Gap	187	129	51	7.7	---	---	---	---	---	---	---	---

Source: Field Survey, 2007-08

Table 5.7. Constraints/Interventions in Cultured Fisheries: Response in Hamirpur District of Himachal Pradesh (Block-wise)

Constraint	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Inadequate supply of fingerlings	√	√	√	√	√	√	√
Non-availability of fish feed	√	√	√	√	√	√	√
Poor quality and inadequate water supply	√	√	√	√	√	√	√
Lack of Training	√	√	√	√	√	√	√
Lack of technical know-how	√	√	√	√	√	√	√
Inappropriate pond structure	√	√	√	√	√	√	√
Perishability nature	√	√	√	√	√	√	√
Non-remunerative price	√	√	√	√	√	√	√
Lack of market facilities	√	√	√	√	√	√	√
Non-availability of nets, boats, medicines etc.	√	√	√	√	√	√	√

Source: Field Survey, 2007-08

Table 5.8 Marketing of Agricultural Produce (Metric Tonnes) in Hamirpur District of Himachal Pradesh (Block-wise)

Commodities	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Cereals							
Total production	24087.80	16975.85	32137.61	27268.88	25483.10	12281.51	138234.75
Consumption	18169.43	11925.53	23052.31	18611.01	18625.60	9837.49	100221.36
Marketed surplus	5511.29	4770.21	8619.31	8142.49	6360.58	2265.94	35669.82
Markets where sold (Percentage)							
Local (within area)	22.36	18.65	20.58	18.10	21.43	19.17	20.09
Distant (within state)	9.55	8.75	12.80	11.14	10.25	11.50	10.84
Distant (outside state)	68.09	72.60	66.62	70.76	68.32	69.33	69.07
Post harvest losses	407.08	280.10	466.00	515.38	496.92	178.08	2343.56
Pulses							
Total production	25.93	76.78	22.40	105.98	47.98	50.23	329.30
Consumption	23.92	65.34	19.61	94.48	43.51	45.09	291.95
Marketed surplus	1.88	11.29	2.65	11.14	4.24	4.81	36.00
Markets where sold (Percentage)							
Local (within area)	100.00	100.00	100.00	100.00	100.00	100.00	600.00
Distant (within state)	-	-	-	-	-	-	-
Distant (outside state)	-	-	-	-	-	-	-
Post harvest losses	0.13	0.15	0.14	0.36	0.24	0.33	1.34
Oilseeds							
Total production	7.54	47.36	26.19	23.89	59.37	19.15	183.50
Consumption	7.54	47.36	26.19	23.89	59.37	19.15	183.50
Marketed surplus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Markets where sold (Percentage)							
Local (within area)	-	-	-	-	-	-	0.00
Distant (within state)	-	-	-	-	-	-	0.00
Distant (outside state)	-	-	-	-	-	-	0.00
Post harvest losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetables							
Total production	3785.6	3812.6	5131.0	11219.7	5338.9	3556.0	32843.8
Consumption	76.8	75.5	100.1	233.4	112.1	67.2	665.1

Marketed surplus	3131.4	3275.8	4299.8	9791.4	4501.8	3039.0	28039.2
Markets where sold (Percentage)							
Local (within area)	2.14	4.63	3.15	4.62	2.10	2.53	3.49
Distant (within state)	90.56	88.85	92.67	85.65	86.84	91.23	88.44
Distant (outside state)	7.30	6.52	4.18	9.73	11.06	6.24	8.07
Post harvest losses	577.30	461.32	731.17	1194.90	725.02	449.83	4139.55

Source: Field Survey, 2007-08

Table 5.9 Marketing of Horticulture Produce (Metric Tonnes) in Hamirpur District of Himachal Pradesh (Block-wise)

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Total production of fruits	401.27	482.01	448.66	1017.49	983.81	462.86	3796.10
Consumption	60.60	43.97	54.97	104.33	110.74	57.64	432.25
Marketed surplus	280.07	387.43	338.86	795.33	739.76	339.87	2881.32
Markets where sold (Per cent)							
Local (within area)	9.75	28.46	14.90	22.28	16.15	20.14	19.20
Distant (within State)	90.25	69.65	85.10	75.15	83.85	79.86	79.84
Distant (outside state)	0.00	1.89	0.00	2.57	0.00	0.00	0.96
Post harvest losses	60.60	50.61	54.83	117.83	133.31	65.36	482.52

Source: Field Survey, 2007-08

Table 5.10 Marketing of Livestock and their Products in Hamirpur District of Himachal Pradesh (Block-wise)

Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Milk ('000' L/day)							
Total production	36.34	40.51	29.04	65.85	54.67	20.29	246.70
Consumption	30.98	30.21	22.97	51.04	45.49	15.04	195.73
Marketed surplus	5.36	10.29	6.07	14.82	9.18	5.24	50.97
Wool (Q/yr)							
Total production	28.91	32.05	19.92	10.18	3.35	27.29	121.69
Consumption	17.20	6.41	6.97	4.07	1.68	9.55	45.88
Marketed surplus	11.71	25.64	12.95	6.11	1.68	17.74	75.81
Sheep & goat meat (Q/yr)							
Total production	4.45	6.65	3.50	4.58	9.46	4.23	32.87
Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marketed surplus	4.45	6.65	3.50	4.58	9.46	4.23	32.87
Eggs (Lakh No.)							
Total production	1.42	3.00	1.74	10.38	1.82	1.14	19.50
Consumption	0.21	0.36	0.35	1.04	0.25	0.21	2.42
Marketed surplus	1.21	2.64	1.39	9.34	1.56	0.94	17.08
Poultry birds sold for chicken (No./yr)	10525	12565	15356	12453	14685	13569	79153
Sheep/ goat sold (No./yr)	5369	4364	3696	3091	2310	4948	23778
Cattle sold (No./yr)	1679	1925	769	2504	1533	1513	9923
Buffaloes sold (No./yr)	1493	2106	1330	3784	2524	1122	12359

Source: Field Survey, 2007-08

Table 5.11 Marketing Infrastructure (No.) in Hamirpur District of Himachal Pradesh (Block-wise)

Particulars	Status	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Collection centres	E	0	0	0	0	0	0	0
	R	4	3	4	6	3	4	24
Market yard/sub yard	E	0	1	0	1	0	0	2
	R	1	1	1	2	2	1	8
Market information centre	E	1	0	0	0	0	0	1
	R	1	1	1	1	1	1	6
Co-operative marketing society	E	0	0	0	0	0	0	0
	R	10	12	15	17	14	10	78
Co-operative input society	E	32	20	43	51	40	19	205
	R	4	5	6	7	5	7	34
Banking and insurance facility	E	9	7	10	17	17	9	69
	R	5	6	8	6	5	7	37
Agri/Horti input supply centre including PACS	E	8	6	10	8	6	7	45
	R	2	2	2	2	2	2	12
Others (Transport Society)	E	2	0	0	0	0	0	2
	R	1	1	1	1	1	1	6

Note: E-Existing; R- Required
Source: Field Survey, 2007-08

Table 5.12 Financial Estimates for Marketing Infrastructure of Livestock Products (Rs. Lakh) in Hamirpur District of Himachal Pradesh (Block-wise)

Particular	Tauni Devi		Hamirpur		Bhoranj		Nadaun		Bijhari		Sujanpur		District	
	Nos.	Funds	Nos.	Funds	Nos.	Funds	Nos.	Funds	Nos.	Funds	Nos.	Funds	Nos.	Funds
Chilling plants	1	20	1	20	1	20	2	40	1	20	1	20	7	140
Refrigerated /insulated van	1	7	2	14	1	7	2	14	1	7	2	14	8	56
Pasteurizatio n-cum- packing machine	1	16	2	32	1	16	2	32	1	16	2	32	8	256
Milk collection & testing centre	1	2.5	1	2.5	1	2.5	2	5	1	2.5	1	2.5	7	17.5
Slaughter house	0	0	1	5	0	0	1	10	0	0	1	5	3	20
Total	4	45.5	7	73.5	4	45.5	9	101	4	45.5	7	73.5	33	489.5

Source: Field Survey, 2007-08

Table 5 13 Existing Infrastructural Schemes for Rural Development in Hamirpur District of Himachal Pradesh (Block-wise)

Block	No. of schemes	Village covered (No.)	Population covered (No.)	Area covered (Ha)	Beneficiary families (No.)	Status	
						Complete (No.)	Incomplete (No.)
Roads							
Tauni Devi	37	37	80000	190	1480	37	0
Hamirpur	131.2	141	28000	715	7310	0	0
Bhoranj	55	150	60000	280	12130	30	25
Nadaun	40	110	32000	202	782	0	0
Bijhari	379	75	25600	1625	1569	262	117
Sujanpur	369	96	18965	1502	1897	0	0
District	1011.2	609	244565	8914	21702	329	142
Bridges							
Tauni Devi	2	11	20000	0	3975	0	0
Hamirpur	2	141	28000	0	6500	0	0
Bhoranj	2	60	26000	0	5500	14	1
Nadaun	2	8	12000	0	2500	5	0
Bijhari	2	15	15000	0	2950	0	0
Sujanpur	2	15	16000	0	3298	0	0
District	2	220	66000	0	15038	19	1

Source: Field Survey, 2007-08

Table 5.14 Human Resource for Agricultural Development (No.) in Hamirpur District of Himachal Pradesh (Block-wise)

Position	Tauni Devi			Hamirpur			Bhoranj			Nadaun			Bijhari			Sujanpur			District								
	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R	S	P	R			
SMS (Agri)	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	6	6	0	6	0
ADOs	2	2	3	1	1	2	2	4	2	2	3	1	2	2	1	2	1	1	2	1	2	1	10	9	17	7	7
AEOs	6	4	10	4	8	3	12	4	8	1	10	1	8	6	10	2	8	4	10	2	9	1	13	4	47	19	65
SMS (Horti)	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	6	6
HDOs	1	1	2	1	1	2	1	1	2	1	1	1	1	3	2	2	1	3	1	1	1	1	2	1	7	6	14
HEOs	2	2	4	2	2	1	6	4	3	1	5	2	5	4	8	3	4	4	7	3	4	3	6	2	20	15	36
SDSCO (Soil cons.)																											
ADOs	1	1	2	1	1	1	0	0	1	1	0	0	1	1	1	0	0	1	1	0	0	1	1	1	2	2	8
AEOs	1	1	2	1	1	2	1	0	2	2	0	0	2	2	0	0	0	2	2	0	0	2	2	1	1	10	9
JE, DM, JDM	0	0	3	0	0	2	0	0	3	0	0	2	2	0	2	0	0	3	0	3	0	0	3	0	0	16	16
Sr. Veterinary officers	1	1	1	0	1	2	1	0	0	1	1	0	1	1	1	1	1	1	1	0	0	0	1	2	3	7	4
Veterinary doctors	2	2	5	3	3	5	2	3	3	3	6	3	4	4	7	3	4	7	3	3	2	6	3	18	17	34	16
Veterinary pharmacists	46	43	55	9	23	20	30	7	21	20	25	4	20	16	25	5	16	15	15	25	9	147	134	190	43	190	43
Extension specialists for																											
Bee keeping	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	1	1	0	1	1	0	0	6
Mushroom	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	1	1	0	0	6	6
Floriculture	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	6	6
Sr Fishery officers	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4	4
Fishery sub-inspectors	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	2	1	1	7	6
Fisheries field assistants	0	0	2	2	0	0	3	0	4	4	0	3	3	0	2	2	0	0	0	3	0	3	3	0	0	17	17
Sericulture inspectors	1	1	1	0	1	1	3	2	0	0	1	1	0	0	1	1	0	0	1	1	1	1	2	1	3	9	6
Sericulture assistants	0	0	1	1	0	0	3	3	0	0	2	2	13	13	17	4	0	0	4	0	0	4	4	13	13	30	17
Protected cultivation	0	0	1	1	0	0	2	2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	7	7
Total	62	58	98	34	43	34	82	40	39	29	79	39	41	37	75	34	55	45	89	34	37	26	78	41	277	229	501

Source: Field Survey, 2007-08

Table 5.15 Financial Estimates for Human Resources Development (Rs. Lakh) in Hamirpur District of Himachal Pradesh (Block-wise)

Position	Tauni Devi		Hamirpur		Bhoranj		Nadaun		Bijhari		Sujanpur		District	
	Gap	Funds	Gap	Funds	Gap	Funds	Gap	Funds	Gap	Funds	Gap	Funds	Gap	Funds
SMS (Agri)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADOs	1	7	1	7	2	14	1	7	1	7	1	7	1	7
AEOs	4	17	4	17	1	4	2	8	2	8	4	17	17	71
SMS (Horti)	1	8	1	8	1	8	1	8	1	8	1	8	1	8
HDOs	1	7	1	7	1	7	2	14	1	7	1	7	1	7
HEOs	3	12	4	17	2	8	3	12	3	12	2	8	17	69
SDESCO (Soil conservation)														
ADOs	1	7	1	7	1	7	1	7	1	7	1	7	1	7
AEOs		0	1	4	2	8	2	8	2	8	2	8	2	8
JE, DM, JDM	3	21	2	14	3	21	2	14	3	21	3	21	3	21
Sr. veterinary officers	0	0	1	12	1	12	1	12	0	0	1	12	1	12
Veterinary doctors	3	11	2	8	2	8	3	11	3	11	3	11	3	11
Veterinary pharmacists	9	30	7	23	9	30	4	13	5	17	9	30	43	143
Extension Specialist for														
Bee keeping	1	8	1	8	1	8	1	8	1	8	1	8	1	8
Mushroom	1	8	1	8	1	8	1	8	1	8	1	8	1	8
Floriculture	1	8	1	8	1	8	1	8	1	8	1	8	1	8
Sr Fisheries officer	1	8	1	8	1	8	1	8	0	0	0	0	0	0
Fishery sub Inspectors	1	4	1	4	1	4	1	4	1	4	1	4	1	4
Fishery field assistants	2	7.5	3	11.5	4	16.5	3	11.5	2	7.5	3	11.5	17	66
Sericulture inspector	0	0	2	8	1	4	1	4	1	4	1	4	1	4
Sericulture assistants	1	4	3	12	3	12	2	8	4	17	4	17	17	70
Protected cultivation	1	7	2	14	1	7	1	7	1	7	1	7	1	7
Total	35	175	40	206	39	203	34	181	34	170	41	204	223	1136

Source: Field Survey, 2007-08

Table 5.16 Unemployment Status (No.) in Hamirpur District of Himachal Pradesh (Block-wise)

Education	Sex	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Matriculate	M	2572	1342	1845	3242	2683	1118	12802
	F	1462	763	1049	1843	1526	636	7279
	T	4034	2104	2894	5086	4209	1754	20081
Plus two	M	2368	1235	1699	2985	2471	1029	11787
	F	1202	627	863	1516	1255	523	5986
	T	3570	1863	2561	4501	3725	1552	17772
Graduate	M	1004	524	720	1266	1048	437	4999
	F	889	464	638	1120	927	386	4424
	T	1893	987	1358	2386	1975	823	9422
Post graduate	M	541	282	388	683	565	235	2694
	F	472	246	339	595	492	205	2349
	T	1013	529	727	1278	1057	441	5045
Technically Trained	M	590	308	423	744	616	257	2938
	F	148	77	106	187	155	65	738
	T	738	385	530	931	771	321	3676
Total	M	7075	3691	5075	8920	7383	3076	35220
	F	4173	2177	2995	5261	4355	1815	20776
	T	11248	5868	8070	14182	11737	4891	55996

Note: M-Male, F-Female and T- Total

Source: Field Survey, 2007-08

Table 5.17 Status of Enterprises in Hamirpur District of Himachal Pradesh (Block-wise)

Block	Existing			Potential			Assistance (credit)
	No. of units	Persons employed (No.)	Investment (Rs. lakh)	No. of units	Employment (No.)	Investment (Rs. Lakh)	
Atta chakki							
Tauni Devi	272	272	90	120	120	108	√
Hamirpur	60	100	30	5	7	4.5	√
Bhoranj	51	90	22	10	20	9	√
Nadaun	61	105	31	12	24	10.8	√
Bijhari	260	260	50	80	80	72	√
Sujanpur	157	157	75	100	100	90	√
District	861	984	223	327	351	294.3	√
Oil expeller							
Tauni Devi	5	5	0.52	5	5	1.75	√
Hamirpur	35	40	2.8	6	8	2.1	√
Bhoranj	20	25	1	2	4	0.7	√
Nadaun	30	40	1.6	4	6	1.4	√
Bijhari	30	30	10	0	0	0	√
Sujanpur	5	5	0	6	6	2.1	√
District	125	145	15.92	23	29	8.05	√
Rice sheller							
Tauni Devi	7	7	1.4	3	3	0.75	√
Hamirpur	0	0	0	0	0	0	√
Bhoranj	0	0	0	0	0	0	√
Nadaun	10	10	1.6	0	0	0	√
Bijhari	12	12	2	0	0	0	√
Sujanpur	4	4	0	6	6	1.5	√
District	33	33	5	9	9	2.25	√
Bakery							
Tauni Devi	4	12	1.2	2	6	0.8	√
Hamirpur	2	6	3	5	25	2	√
Bhoranj	0	0	0	5	25	2	√
Nadaun	5	5	0.7	6	5	2.4	√
Bijhari	8	10	1.2	5	5	2	√
Sujanpur	0	0	0	2	4	0.8	√
District	19	33	3.1	25	70	10	√
Vermi-compost							
Tauni Devi	90	90	135	120	120	42	√
Hamirpur	45	45	9.75	150	150	52.5	√
Bhoranj	90	90	31.5	25	25	8.75	√
Nadaun	105	65	6	500	200	175	√
Bijhari	80	40	5	600	50	210	√
Sujanpur	64	64	11.7	200	200	70	√
District	474	394	198.95	1595	745	558.25	√
Maize sheller							
Tauni Devi	63	50	4.3	20	20	2.2	√
Hamirpur	97	97	7.75	30	30	3.3	√

Bhoranj	0	0	0	0	0	0	√
Nadaun	145	155	9	60	60	6.6	√
Bijhari	170	170	10	80	80	8.8	√
Sujanpur	50	50	0	10	10	1.1	√
District	525	522	31.05	200	200	22	√
Mushroom compost							
Tauni Devi	0	0	0	2	6	7	√
Hamirpur	0	0	0	2	10	7	√
Bhoranj	0	0	0	2	10	7	√
Nadaun	0	0	0	0	0	0	√
Bijhari	1	1	2	1	1	3.5	√
Sujanpur	2	4	3.5	1	1	3.5	√
District	3	5	5.5	8	28	28	√
Rural craft							
Tauni Devi	116	180	1.16	20	20	3	√
Hamirpur	0	0	0	5	10	0.75	√
Bhoranj	0	0	0	10	20	1.5	√
Nadaun	30	30	1.5	40	80	6	√
Bijhari	50	50	3	50	100	7.5	√
Sujanpur	25	30	2	40	80	6	√
District	221	290	7.66	165	310	24.75	√
Nursery raising							
Tauni Devi	6	16	1.5	6	18	4.2	√
Hamirpur	0	0	0	0	0	0	√
Bhoranj	4	8	8	4	8	2.8	√
Nadaun	15	15	3	40	40	28	√
Bijhari	25	25	3	30	30	21	√
Sujanpur	0	0	0	0	0	0	√
District	50	64	9.1	80	96	56	√
Flower nursery							
Tauni Devi	5	13	0	5	13	7.5	√
Hamirpur	0	0	0	0	0	0	√
Bhoranj	0	0	0	0	0	0	√
Nadaun	0	0	0	30	30	45	√
Bijhari	0	0	0	25	25	37.5	√
Sujanpur	0	0	0	20	20	30	√
District	5	13	0	80	88	120	√
Seed production							
Tauni Devi	0	0	0	0	0	0	√
Hamirpur	0	0	0	0	0	0	√
Bhoranj	0	0	0	0	0	0	√
Nadaun	0	0	0	4	6	2	√
Bijhari	0	0	0	5	10	2.5	√
Sujanpur	0	0	0	8	15	4	√
District	0	0	0	17	31	8.5	√
Pottery							
Tauni Devi	31	70	1.6	10	20	1.5	√
Hamirpur	0	0	0	5	10	0.75	√
Bhoranj	0	0	0	10	25	1.5	√

Nadaun	3	3	0.15	5	5	0.75	√
Bijhari	5	5	0.25	7	7	1.05	√
Sujanpur	20	40	0	10	20	1.5	√
District	59	118	2	47	87	7.05	√
	Feed mill						
Tauni Devi	0	0	0	0	0	0	√
Hamirpur	0	0	0	2	10	4.5	√
Bhoranj	0	0	0	1	5	2.25	√
Nadaun	2	4	3	12	12	27	√
Bijhari	2	2	3	10	10	22.5	√
Sujanpur	0	0	0	1	5	2.25	√
District	4	6	6	26	42	58.5	√
	Fruit and vegetable processing						
Tauni Devi	0	0	0	0	0	0	√
Hamirpur	0	0	0	2	10	1	√
Bhoranj	2	6	1	5	25	2.5	√
Nadaun	0	0	0	10	10	5	√
Bijhari	0	0	0	5	5	2.5	√
Sujanpur	2	10	0	10	0	5	√
District	4	16	1	32	50	16	√
	Pickles/squashes						
Tauni Devi	0	0	0	0	0	0	√
Hamirpur	0	0	0	2	10	0.4	√
Bhoranj	0	0	0	2	10	0.4	√
Nadaun	2	4	0.4	5	10	1	√
Bijhari	1	2	0.5	5	8	1	√
Sujanpur	1	3	1	5	10	1	√
District	4	9	1.9	19	48	3.8	√
	Pulse processing						
Tauni Devi	26	26	0.55	20	0	3	√
Hamirpur	0	0	0	4	20	0.6	√
Bhoranj	0	0	0	4	20	0.6	√
Nadaun	0	0	0	7	7	1.05	√
Bijhari	0	0	0	5	5	0.75	√
Sujanpur	2	4	2	20	30	3	√
District	28	30	2.55	60	82	9	√
	Bee keeping						
Tauni Devi	4	4	1.75	0	0	0	√
Hamirpur	0	0	0	2	10	0.7	√
Bhoranj	0	0	0	2	10	0.7	√
Nadaun	0	0	0	0	0	0	√
Bijhari	0	0	0	0	0	0	√
Sujanpur	0	0	0	0	0	0	√

District	4	4	1.75	4	20	1.4	√
	Shawl, woolen garments						
Tauni Devi	0	0	0	0	0	0	√
Hamirpur	8	16	0.64	4	12	1.4	√
Bhoranj	4	8	0.2	4	12	1.4	√
Nadaun	0	0	0	0	0	0	√
Bijhari	0	0	0	0	0	0	√
Sujanpur	0	0	0	0	0	0	√
District	12	24	0.84	8	24	2.8	√
Grand Total	2431	2690	515.72	2725	2310	1230.65	

Source: Field Survey, 2007-08

Table 5.18 Potential Enterprises for Unemployed in Hamirpur District of Himachal Pradesh (Block-wise)

Sr No.	Enterprise	Mandays/year	Assistance (tick off)	
			Training	Credit
1	Apiculture	100	√	√
2	Poultry	365	√	√
3	Mushroom growing	130	√	√
4	Value additon	85	√	√
5	Sericulture	90	√	√
6	Agro-tourism	60	√	√
7	Private jobs	365	-	-
8	Own business	320	√	√

Source: Field Survey, 2007-08

Table 5.19 Agri-Business Establishments (No.) in Hamirpur District of Himachal Pradesh (Block-wise)

Block	Status	Agro sale centres	PACS	Rural handicraft		Cooperative		Farmers co-operatives	Others
				Public	Private	Public	Private		
Tauni Devi	E	0	32	0	4	0	0	0	0
	R	0	0	0	0	0	0	0	0
	G	0	0	0	0	0	0	0	0
Hamirpur	E	1	26	0	5	0	8	10	0
	R	1	2	2	5	2	10	12	5
	G	0	0	2	0	2	2	2	5
Bhoranj	E	1	70	0	0	0	0	0	0
	R	2	0	5	5	1	1	2	4
	G	1	0	5	5	1	1	2	4
Nadaun	E	6	94	0	4	0	0	0	0
	R	10	125	0	5	0	0	0	0
	G	4	31	0	1	0	0	0	0
Bijhari	E	7	36	3	0	3	0	3	0
	R	5	7	10	1	7	1	10	0
	G	0	0	7	1	4	1	7	0
Sujanpur	E	2	25	4	4	0	0	3	0
	R	4	0	0	0	0	0	0	0
	G	2	0	0	0	0	0	0	0
District	E	17	283	7	17	3	8	16	0
	R	22	134	17	16	10	12	24	9
	G	5	0	10	0	7	4	8	9

E-Existing, R-Required and G-Gap
Source: Field Survey, 2007-08

Table 5.20 Status of Drudgery of Women (Per Cent of Women) in Hamirpur District of Himachal Pradesh (Block-wise)

Particulars	Mode of operation	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Agricultural operations								
Clod breaking	Manually	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Power iron clod breaker	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paddy transplanting	Manually	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Transplanter	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manuring & fertilization	Manually	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Power machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Intercultural operations	Manually	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Power machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheat threshing & winnowing	Manually	9.50	4.65	4.50	2.30	6.45	8.85	5.91
	Power machinery	90.50	95.35	95.50	97.70	93.55	91.15	94.09
Livestock rearing operations								
Fodder resources	Cultivated	3.64	6.25	5.15	4.12	3.75	2.50	4.19
	Ghasni	75.10	66.55	68.45	63.75	76.35	74.24	70.60
	Both	21.26	27.20	26.40	32.13	19.90	23.26	25.22
Fodder cutting	Traditional tools	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Improved tools	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fodder transportation	On head/backload	98.65	88.34	90.84	84.65	89.62	94.76	90.89
	Tractor-trolley	1.35	11.66	9.16	15.35	10.38	5.24	9.11
Fodder chaffing	Chaff cutter	35.64	65.25	55.32	64.43	48.63	51.35	53.41
	Without chaff cutter	64.36	34.75	44.68	35.57	51.37	48.65	46.59
Feeding system	Inside manger	20.54	25.63	40.63	32.60	22.18	14.10	26.09
	On floor	79.46	74.37	59.37	67.40	77.82	85.90	73.91
Feeding practices	Stall feeding	75.15	72.65	73.25	69.75	76.41	75.85	73.69
	Grazing	5.50	4.65	7.50	8.50	9.60	3.89	6.81
	Both	19.35	22.70	19.25	21.75	13.99	20.26	19.50
Animal waste disposal	Bio-gas plant	1.50	1.75	0.89	1.50	1.25	0.95	1.33
	Head/back-load to field	5.10	2.50	5.50	6.50	4.15	3.10	4.63
	FYM	93.40	95.75	93.61	92.00	94.60	95.95	94.04
Cleaning of animals & sheds	Manually	98.75	97.23	95.78	96.50	97.88	98.50	97.44
	Water pressure tap pipe	1.25	2.77	4.22	3.50	2.12	1.50	2.56
Milking operation	Hand milking	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Machine milking	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selling of milk	Within village	90.63	93.45	72.63	68.25	85.66	89.45	82.61

	Distant market	9.37	6.55	27.37	31.75	14.34	10.55	17.39
Churning of milk	Manually	42.15	39.84	35.68	44.48	52.36	46.55	43.85
	Using machine	57.85	60.16	64.32	55.52	47.64	53.45	56.15
Breeding methods	Natural service	70.65	75.15	82.56	65.83	83.39	79.56	75.51
	A.I.	29.35	24.85	17.44	34.17	16.61	20.44	24.49
Type of animal house	Single story	62.80	54.89	49.63	55.65	48.15	55.10	54.54
	Double story	37.20	45.11	50.37	44.35	51.85	44.90	45.46
Animal shed	Kachha	82.16	87.74	82.45	88.48	93.45	91.65	87.72
	Pucca	17.84	12.26	17.55	11.52	6.55	8.35	12.28
Light and ventilation	Sufficient	15.10	22.48	25.98	23.52	21.12	19.63	21.24
	Insufficient	84.90	77.52	74.02	76.48	78.88	80.37	78.77
Roof of animal shed	Slated	95.15	94.35	96.25	95.15	96.15	95.25	95.39
	Asbestos sheets	2.22	3.52	1.82	2.14	2.05	2.85	2.39
	RCC lential	2.63	2.13	1.93	2.71	1.80	1.90	2.22
Floor of animal shed	Kachha	68.45	65.28	60.64	70.25	71.65	72.15	68.37
	Pucca	31.55	34.72	39.36	29.75	28.35	27.85	31.63

Source: Field Survey, 2007-08

Table 5.21 Livestock Feed and Fodder for Milch Animals (Kg/animal/day) in Hamirpur District of Himachal Pradesh (Block-wise)

Type of animal	Fodder/ Feed	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Crossbred cows	Green fodder	11.65	16.57	14.32	17.15	14.28	13.77	14.62
	Dry fodder	9.75	8.25	8.14	9.14	8.45	7.94	8.61
	Concentrate	2.25	2.50	1.98	2.25	2.20	2.34	2.25
	Minerals (g)	8.65	12.55	14.80	16.55	14.80	15.08	13.74
Local cow	Green fodder	7.86	8.41	8.54	9.10	10.59	8.24	8.79
	Dry fodder	6.52	6.89	7.10	6.19	6.95	7.83	6.91
	Concentrate	0.50	0.60	0.89	1.25	1.10	1.23	0.93
	Minerals (g)	0.42	2.10	1.01	0.82	0.10	1.02	0.91
Buffaloes	Green fodder	16.54	18.60	19.85	17.66	17.86	16.95	17.91
	Dry fodder	11.68	9.82	8.63	8.20	9.63	7.78	9.29
	Concentrate	2.10	2.42	1.95	2.56	1.89	1.82	2.12
	Minerals (g)	11.32	10.23	15.06	14.43	8.23	7.10	11.06
Bullocks	Green fodder	10.25	8.56	10.66	10.12	8.67	9.56	9.64
	Dry fodder	8.22	7.65	8.66	8.15	6.61	7.58	7.81
	Concentrate	0.45	0.35	0.25	0.27	0.45	0.65	0.40
Poultry (layer)	Concentrate (g)	85.00	110.00	115.00	108.00	95.00	100.00	102.17
Broilers	Concentrate (g)	67.00	80.00	60.00	65.25	74.28	77.10	70.61

Source: Field Survey, 2007-08

Table 5.22 Yield Gap in Livestock Production (Units/animal/day) in Hamirpur District of Himachal Pradesh (Block-wise)

Block		Milk (L/Ani/D)				Wool (Kg/Ani/Year)	Poultry (eggs No./year/ bird)	Broiler (Kg./bird)
		Crossbred cows	Local cow	Buffalo	Goats	Sheep		
Tauni Devi	A	5.75	1.80	3.79	0.54	0.60	145.00	2.00
	P	9.50	3.00	7.50	0.66	0.85	220.00	2.50
	G	3.75	1.20	3.71	0.12	0.25	75.00	0.50
Hamirpur	A	6.25	2.25	4.15	0.39	0.75	165.00	1.75
	P	10.15	3.25	8.25	0.50	0.85	225.00	2.25
	G	3.90	1.00	4.10	0.11	0.10	60.00	0.50
Bhoranj	A	6.10	2.60	3.80	0.42	0.64	180.00	1.70
	P	9.50	3.10	7.96	0.54	0.78	218.00	2.20
	G	3.40	0.50	4.16	0.12	0.14	38.00	0.50
Nadaun	A	6.50	2.04	4.20	0.41	0.64	182.00	1.85
	P	10.20	3.60	8.50	0.60	0.82	240.00	2.40
	G	3.70	1.56	4.30	0.19	0.18	58.00	0.55
Bijhari	A	6.40	2.00	4.00	0.42	0.70	160.00	1.90
	P	9.60	3.20	7.75	0.65	0.90	224.00	2.40
	G	3.20	1.20	3.75	0.23	0.20	64.00	0.50
Sujanpur	A	5.50	2.20	4.35	0.40	0.75	168.00	1.82
	P	9.25	3.40	7.75	0.64	0.85	230.00	2.30
	G	3.75	1.20	3.40	0.24	0.10	62.00	0.48
District	A	6.17	2.08	4.07	0.43	0.68	166.67	1.84
	P	9.70	3.26	7.95	0.60	0.84	226.17	2.34
	G	3.53	1.18	3.88	0.17	0.16	59.50	0.51

Note: A-Actual, P-Progressive, G-Gap

Source: Field Survey, 2007-08

Table 5.23 Reasons for Yield Gaps in Livestock Production (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Type of animal	Reasons for gap	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Crossbred cow	Improper feeding practices	80.00	75.00	75.00	66.67	60.00	100.00	75.00
	Imbalanced diet	80.00	75.00	75.00	66.67	60.00	100.00	75.00
	Poor management	40.00	75.00	50.00	50.00	60.00	50.00	53.57
Local cow	Improper feeding practices	60.00	75.00	50.00	50.00	40.00	50.00	53.57
	Imbalanced diet	40.00	75.00	50.00	50.00	40.00	50.00	50.00
	Poor management	60.00	75.00	75.00	83.33	60.00	50.00	67.86
Buffaloes	Improper feeding practices	80.00	75.00	75.00	66.67	60.00	100.00	75.00
	Imbalanced diet	80.00	75.00	75.00	66.67	60.00	100.00	75.00
	Poor management	40.00	75.00	50.00	50.00	60.00	50.00	53.57
Goats	Different grazing practices	40.00	75.00	50.00	66.67	40.00	50.00	53.57
	Imbalanced diet	80.00	75.00	100.00	83.33	80.00	75.00	82.14
	Poor management	60.00	75.00	50.00	66.67	60.00	50.00	60.71
Sheep wool	Imbalanced diet	80.00	100.00	75.00	83.33	80.00	75.00	82.14
	Poor feeding practices	40.00	75.00	50.00	66.67	40.00	50.00	53.57
Poultry	Imbalanced diet	40.00	50.00	50.00	33.33	40.00	50.00	42.86
	Poor feeding practices	60.00	50.00	75.00	33.33	60.00	50.00	53.57
Broilers	Improper ventilation	60.00	75.00	100.00	66.67	80.00	75.00	75.00
	Poor feeding practices	40.00	50.00	75.00	50.00	40.00	50.00	50.00

Source: Field Survey, 2007-08

Table 5.24 Incidence and Mortality of Livestock due to Diseases (Per cent) in Hamirpur District of Himachal Pradesh

Type of animal/Disease	Tauni Devi		Hamirpur		Bhoranj		Nadaun		Bijhari		Sujanpur		District		Treat. Available
	I	M	I	M	I	M	I	M	I	M	I	M	Infected	Mortality	
Cattle and Buffaloes															
a. FMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	y
b. Hemorrhagic septicaemia	0	0	0.1	0.1	0	0	0	0	0	0	2	1	0.35	0.18	y
c. Tympny	12	1.5	10	2	22	3	0	0	9	1	6	0.3	9.83	1.13	y
d. Pneumonia	4	0.2	6	1	7	0.5	0	0	2	0	5	0.5	4	0.37	y
e. Diarrhoea/syentery	8	1	7	2	16	4	0	0	5	1	10	2	7.67	1.5	y
f. Calf scour	12	6	15	4	11	4.5	14	5	22	7	20	5	15.67	4.08	y
g. Endoparasites	62	3	50	1.5	40	2	52	4	60	2	70	4	55.67	2.42	y
h. Ectoparasites	50	1	40	0.5	60	1.5	40	2	45	1	65	2	50	1.17	y
i. Repeat sreedng	18	0	20	0	25	0	22	0	18	0	26	0	21.5	0	y
j. others	8	0.5	5	0.3	7	0.3	8	2	12	3	10	3	8.33	1.01	y
Sheep & Goats															
a. PPR/CCPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n
b. Mange	2.5	0.1	3	0.2	7	0.3	4	0	5	0	2	0	3.92	0.12	y
c. Lice and ticks	60	2	45	2.5	40	1	44	2	50	2	70	2	51.5	1.58	y
d. Endoparasites	60	3	65	1	52	2	60	5	70	3	75	4	63.67	2.5	y
e. Diarrhoea/dysentery	10	2	7	1	8	2.5	6	1	6	1	18	3	9.17	1.54	y
f. others	10	3	5	2	9	3	6	2	8	3	14	4	8.67	2.25	y
Poultry															
a. Coccidiosis	34	4	42	6	30	5	50	5	30	4	40	5	37.67	4.17	y
b. Ranikhet disease	4	3	2	1.5	1	0.5	5	4	0	0	5	3.5	2.83	2.08	n
c. Fowlpox	4	0.5	0	0	3	0.2	4	1	2	0	6	0.8	3.17	0.33	n
d. Merek's disease	4	2	0	0	2.5	1	2	1	3	2	5	3	2.75	1.17	n
e. others	2	1	6	4	5	1.5	0	0	0	0	4	2	2.83	1.42	n

Table 5.25 Interventions for Diseases and their Management: Cattle and Buffalo in Hamirpur District of Himachal Pradesh

Intervention\ Disease	FMD	HS	Tympany	Pneumonia	Diarrhoea / dysentery	Calf scour	Endoparasites	Ectoparasites	Repeat breeding	Mastitis/rabies
Vaccination	√	√								
Regular deworming	√	√	√	√	√	√	√		√	
Medication	√	√	√	√	√	√	√	√		
Dipping and dusting of affected animals								√		
Endoparasite camps			√	√	√	√	√			
Drenching	√	√	√	√	√	√	√			
Ecoparasite camps	√	√	√	√	√	√	√			
Sterility camps										
Clinical camps			√	√	√	√	√	√	√	√
Treatment of affected animals/sheds/pre mises	√	√	√	√	√	√	√	√	√	√
Balance nutrition	√	√	√	√	√	√	√	√	√	√
Research	√	√	√	√	√	√	√	√	√	√
Awareness camps	√	√	√	√	√	√	√	√	√	√

Source: Field Survey, 2007-08

Table 5.26 Intervention for Diseases and their Management: Sheep/Goat in Hamirpur District of Himachal Pradesh

Intervention\Disease	PPR/CCPP	Mange	Lice & ticks	Endoparasites	Diarrhoea/dysentery	Black quarter
RP vaccination	√					√
Regular deworming		√	√	√	√	
Medication	√	√	√	√	√	√
Dipping and dusting of affected animals		√	√			
Endoparasite camps		√	√	√	√	
Ivermectics injection		√		√		
Ecoparasite camps		√	√		√	
Treatment of affected animals/sheds/premises	√	√	√	√	√	√
Awareness camps	√	√	√	√	√	√

Source: Field Survey, 2007-08

Table 5.27 Intervention for Diseases and their Management: Poultry in Hamirpur District of Himachal Pradesh

Intervention\Disease	Coccidiosis	Ranikhet disease	Fowlpox	Merek's disease	Endoparasites
Vaccination		√	√	√	√
Regular deworming	√				√
Medication	√	√	√	√	√
Medicinal sprays	√				
Dusting with parasitidal drugs	√				√
Awareness camps	√	√	√	√	√

Source: Field Survey, 2007-08

Table 5.28 Intervention for Diseases and their Management: Equine in Hamirpur District of Himachal Pradesh

Intervention\Disease	Respiratory distress	Colic	Internal parasites
Proper housing	√	√	√
Regular deworming	√	√	√
Medication	√	√	√
Research	√	√	√
Endoparasite camps	√	√	√
Diagnostic lab	√	√	√
Extension camps	√	√	√

Source: Field Survey, 2007-08

Table 5.29 Yield Gaps in Important Fruit Crops (Q /ha) in Hamirpur District of Himachal Pradesh (Block-wise)

Crops		Mango	Citrus	Guava	Pome granate	Litchi	Aonla	Plum	Peach	Pear	Others
Tauni Devi	A	6.68	8.96	7.65	4.42	3.91	4.65	2.77	3.87	9.51	3.97
	P	14.10	11.55	10.55	5.65	7.25	8.68	4.25	6.45	14.12	5.25
	G	7.42	2.59	2.90	1.23	3.34	4.03	1.48	2.58	4.61	1.28
Hamirpur	A	6.37	5.92	8.56	5.49	5.12	6.10	2.10	4.58	11.63	3.25
	P	16.50	10.36	11.63	6.12	8.45	7.65	4.77	7.31	12.55	6.15
	G	10.13	4.44	3.07	0.63	3.33	1.55	2.67	2.73	0.92	2.90
Bhoranj	A	5.63	4.36	9.25	3.60	4.15	7.25	2.26	5.82	9.23	3.66
	P	17.63	7.58	12.63	5.54	7.96	9.54	5.11	8.12	11.86	5.98
	G	12.00	3.22	3.38	1.94	3.81	2.29	2.85	2.30	2.63	2.32
Nadaun	A	8.68	6.15	10.90	4.62	6.55	8.63	2.86	6.21	10.23	4.1
	P	15.90	9.87	13.10	6.45	9.65	9.44	6.12	9.21	14.25	6.75
	G	7.22	3.72	2.20	1.83	3.10	0.81	3.26	3.00	4.02	2.65
Bijhari	A	9.87	5.40	8.60	3.16	4.65	6.25	2.90	5.24	8.66	3.73
	P	13.84	7.54	12.50	5.15	8.91	9.56	3.75	7.56	13.57	5.54
	G	3.97	2.14	3.90	1.99	4.26	3.31	0.85	2.32	4.91	1.81
Sujanpur	A	6.24	6.50	8.50	4.39	4.16	4.90	2.52	4.89	8.25	3.56
	P	11.46	8.56	11.76	5.98	7.84	9.50	5.05	5.87	12.75	5.43
	G	5.22	2.06	3.26	1.59	5.68	4.60	2.53	0.98	4.50	1.87
District	A	7.76	6.04	8.89	4.01	5.02	6.77	2.50	5.23	9.56	3.7
	P	14.91	9.24	12.03	5.82	8.34	9.06	4.84	7.42	13.18	5.85
	G	7.15	3.20	3.14	1.81	3.32	2.29	2.34	2.19	3.62	2.15

Note: A-Actual, P-potential yield; G-Gap

Source: Field Survey, 2007-08

Table 5.30 Reasons for Yield Gaps in Fruit and Floriculture Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Crop	Reasons for gap	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Mango	Frost problem	40.00	50.00	50.00	50.00	40.00	50.00	46.43
	Flower/Fruit drop	60.00	75.00	50.00	66.67	60.00	75.00	64.29
	Difficulty in harvesting	40.00	50.00	75.00	50.00	40.00	50.00	50.00
	Plantations on field bunds	40.00	75.00	75.00	66.67	60.00	75.00	64.29
Citrus	Uneconomical size of orchard	40.00	75.00	100.00	6.67	60.00	50.00	64.29
	Self consumption	20.00	25.00	50.00	33.33	20.00	50.00	32.14
	Poor orchard management	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Plantations on field bunds	40.00	50.00	50.00	50.00	40.00	50.00	46.43
	Uneconomical size of orchard	60.00	75.00	50.00	66.67	40.00	50.00	57.14
	Self consumption	40.00	50.00	75.00	50.00	40.00	50.00	50.00
Guava	Poor orchard management	60.00	75.00	50.00	66.67	40.00	50.00	57.14
	Fruit fly attack	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Plantations on field bunds	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Uneconomical size of orchard	40.00	50.00	75.00	50.00	40.00	50.00	50.00
Plum	Self consumption	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Poor orchard management	60.00	50.00	75.00	83.33	40.00	100.00	67.86
	Fruit fly attack	40.00	50.00	75.00	66.67	20.00	50.00	50.00
	Plantations on field bunds	40.00	50.00	75.00	50.00	40.00	50.00	50.00
	Lak of technical know-how	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Self consumption	80.00	75.00	75.00	66.67	60.00	100.00	75.00
Peach	Poor orchard management	40.00	50.00	75.00	50.00	40.00	50.00	50.00
	Fruit fly attack	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Plantations on field bunds	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Lak of technical know-how	40.00	50.00	75.00	50.00	40.00	50.00	50.00

Pear	Self consumption	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Poor orchard management	40.00	75.00	50.00	66.67	40.00	50.00	53.57
	Fruit fly attack	20.00	50.00	25.00	33.33	20.00	25.00	28.57
	Plantations on field bunds	60.00	75.00	100.00	83.33	60.00	100.00	78.57
Pomegranate	Lak of technical know-how	40.00	50.00	75.00	50.00	40.00	50.00	50.00
	Lak of technical know-how	80.00	75.00	100.00	83.33	80.00	100.00	85.71
	Insect-pest and disease	40.00	50.00	25.00	66.67	40.00	25.00	42.86
	Plantations on field bunds	80.00	75.00	100.00	83.33	80.00	100.00	85.71
Aonla	Imbalanced use of fertilization	80.00	75.00	50.00	50.00	40.00	50.00	57.14
	Poor orchard management	80.00	75.00	75.00	50.00	40.00	50.00	60.71
	Lack of high yielding varieties	40.00	75.00	50.00	50.00	40.00	25.00	46.43
Flower cuttings/ bulbs								
	Non availability of local market	80.00	75.00	75.00	83.33	40.00	75.00	71.43

Source: Field Survey, 2007-08

Table 5.31 Varietal and Technological Problems of Fruit Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Crop	Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Mango								
1	Frost	40.00	75.00	75.00	66.67	60.00	75.00	64.29
2	Alternate bearing	80.00	100.00	100.00	83.33	80.00	100.00	89.29
3	Imbalanced use of fertilizers	80.00	75.00	75.00	50.00	60.00	50.00	64.29
4	Glum blotch	20.00	50.00	25.00	33.33	20.00	25.00	28.57
5	Improper spacing	80.00	100.00	100.00	83.33	80.00	75.00	85.71
6	Flower drop	60.00	50.00	75.00	66.67	60.00	50.00	60.71
7	Local cultivars	40.00	50.00	50.00	50.00	40.00	50.00	46.43
8	Lack of processing and marketing facilities	20.00	75.00	75.00	33.33	60.00	75.00	53.57
Citrus								
1	Cultivation for self consumption	80.00	75.00	75.00	66.67	40.00	50.00	64.29
2	Lack of technological guidance	20.00	50.00	25.00	33.33	20.00	25.00	28.57
3	Local cultivars grown	20.00	25.00	25.00	16.67	20.00	25.00	21.43
4	Citrus canker	40.00	50.00	25.00	33.33	40.00	25.00	35.71
5	Inadequate use of nutrients	60.00	50.00	75.00	50.00	40.00	50.00	53.57
6	Flower drop	40.00	50.00	50.00	33.33	20.00	50.00	39.29
7	Frost	40.00	75.00	75.00	50.00	40.00	50.00	53.57
8	Plants dried after few years	80.00	50.00	75.00	33.33	60.00	75.00	60.71
9	Draught and irrigation facility is not available	80.00	75.00	100.00	66.67	80.00	75.00	78.57
Litchi								
1	Cultivation on small scale	60.00	50.00	50.00	50.00	40.00	25.00	46.43
2	Frost and red rust	60.00	75.00	75.00	66.67	60.00	75.00	67.86
3	Poor cultivation practices	40.00	75.00	50.00	50.00	40.00	50.00	50.00
4	Inadequate use of plant nutrients	60.00	50.00	75.00	50.00	40.00	50.00	53.57
5	Local cultivars	20.00	50.00	50.00	50.00	40.00	25.00	39.29
6	Fruit cracking	60.00	50.00	50.00	50.00	40.00	50.00	50.00
7	Fruit borer attack	20.00	50.00	50.00	33.33	20.00	50.00	35.71

Plum										
1	Poor cultivation practices	60.00	75.00	75.00	66.67	40.00	50.00	60.71		
2	Inadequate use of plant nutrients	60.00	75.00	100.00	83.33	40.00	75.00	71.43		
3	Local cultivars not available	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
4	Fruit fly	80.00	100.00	75.00	83.33	60.00	75.00	78.57		
Peach										
1	Poor cultivation practices	40.00	75.00	50.00	50.00	40.00	50.00	50.00		
2	Inadequate use of plant nutrients	80.00	100.00	75.00	66.67	40.00	75.00	71.43		
3	Local cultivars not available	60.00	50.00	50.00	50.00	40.00	50.00	50.00		
Pear										
1	Poor cultivation practices	40.00	75.00	50.00	50.00	40.00	50.00	50.00		
2	Inadequate use of plant nutrients	80.00	100.00	75.00	66.67	40.00	75.00	71.43		
3	Local cultivars not available	60.00	50.00	50.00	50.00	40.00	50.00	50.00		
Papaya, Pomegranate, Aonla										
1	Frost	80.00	75.00	75.00	83.33	40.00	50.00	67.86		
Guava										
1	Fruit fly attack	80.00	100.00	100.00	83.33	60.00	75.00	82.14		

Source: Field Survey, 2007-08

Table 5.32 Technological Interventions for Fruit Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Crop	Intervention	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Mango								
1	Awareness & training	40.00	75.00	75.00	83.33	60.00	75.00	67.86
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	75.00	57.14
3	Plant protection measures	80.00	75.00	100.00	83.33	60.00	100.00	82.14
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	82.14
5	Frost management	40.00	75.00	75.00	66.67	40.00	50.00	57.14
6	Location specific varieties	80.00	75.00	100.00	83.33	80.00	75.00	82.14
7	Development of regular bearing variety	60.00	100.00	75.00	100.00	80.00	100.00	85.71
Citrus								
1	Awareness programme	40.00	75.00	75.00	83.33	60.00	75.00	67.86
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	75.00	57.14
3	Plant protection measures	80.00	75.00	100.00	83.33	60.00	100.00	82.14
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	82.14
5	Training & pruning	40.00	75.00	50.00	50.00	60.00	50.00	53.57
6	Location specific varieties	60.00	100.00	75.00	100.00	80.00	100.00	85.71
Litchi								
1	Awareness & training	60.00	50.00	50.00	66.67	40.00	50.00	53.57
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	50.00	53.57
3	Plant protection measures	40.00	75.00	50.00	66.67	60.00	50.00	57.14
4	Post-harvest management	40.00	25.00	50.00	50.00	40.00	50.00	42.86
5	Location specific varieties	60.00	100.00	75.00	100.00	80.00	100.00	85.71
Guava								
1	Awareness programme	40.00	75.00	75.00	83.33	60.00	75.00	67.86
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	75.00	57.14
3	Plant protection measures	80.00	75.00	100.00	83.33	60.00	100.00	82.14
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	82.14
5	Training & pruning	40.00	75.00	50.00	50.00	60.00	50.00	53.57
6	Location specific varieties	60.00	100.00	75.00	100.00	80.00	100.00	85.71

Aonla										
1	Awareness programme	40.00	75.00	75.00	83.33	60.00	75.00	75.00	75.00	67.86
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	75.00	75.00	57.14	
3	Plant protection measures	80.00	75.00	100.00	83.33	60.00	100.00	100.00	82.14	
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	100.00	82.14	
5	Training & pruning	40.00	75.00	50.00	50.00	60.00	50.00	50.00	53.57	
6	Location specific varieties	60.00	100.00	75.00	100.00	80.00	100.00	100.00	85.71	
Plum										
1	Awareness programme	60.00	50.00	50.00	66.67	40.00	75.00	75.00	57.14	
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	50.00	50.00	53.57	
3	Plant protection measures	40.00	75.00	50.00	66.67	60.00	75.00	75.00	60.71	
4	Post-harvest management	40.00	50.00	25.00	50.00	40.00	50.00	50.00	42.86	
5	Training & pruning	60.00	100.00	75.00	83.33	60.00	100.00	100.00	78.57	
6	Location specific varieties	60.00	100.00	75.00	66.67	80.00	75.00	75.00	75.00	
Peach and Pear										
1	Awareness programme	40.00	75.00	75.00	83.33	60.00	75.00	75.00	67.86	
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	75.00	75.00	57.14	
3	Plant Protection measures	80.00	75.00	100.00	83.33	60.00	100.00	100.00	82.14	
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	100.00	82.14	
5	Training & Pruning	40.00	75.00	50.00	50.00	60.00	50.00	50.00	53.57	
6	Location specific varieties	60.00	100.00	75.00	100.00	80.00	100.00	100.00	85.71	
Pomegranate										
1	Awareness programme	60.00	50.00	50.00	66.67	40.00	50.00	50.00	53.57	
2	Orchard layout and pit digging	60.00	50.00	50.00	66.67	40.00	50.00	50.00	53.57	
3	Plant protection measures	40.00	75.00	50.00	66.67	60.00	50.00	50.00	57.14	
4	Post-harvest management	60.00	100.00	75.00	83.33	80.00	100.00	100.00	82.14	
5	Training & pruning	60.00	100.00	75.00	100.00	80.00	100.00	100.00	85.71	
6	Location specific varieties	60.00	75.00	100.00	50.00	40.00	50.00	50.00	60.71	

Source: Field Survey, 2007-08

Table 5.33 Varietal and Technological Problems of Other Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Crops	Problems	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Sugarcane								
1	Poor yield	0.00	0.00	0.00	16.67	20.00	0.00	7.14
2	Non-availability of suitable Varieties	0.00	0.00	0.00	16.67	20.00	0.00	7.14
3	Wild animal attack	0.00	0.00	0.00	16.67	20.00	0.00	7.14
Floriculture								
1	Poly-house is not available	40.00	50.00	75.00	66.67	40.00	50.00	53.57
2	Non-availability of proper storage infra-structure	80.00	100.00	75.00	83.33	80.00	100.00	85.71
3	Non-availability of proper package of practices	20.00	50.00	25.00	33.33	20.00	25.00	28.57
4	Lack of technical knowledge	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5	Higher Insect pest and disease attack	40.00	50.00	50.00	50.00	40.00	25.00	42.86
6	Lack of marketing facilities	80.00	100.00	100.00	83.33	80.00	100.00	89.29

Source: Field Survey, 2007-08

Table 5.34 Technological Interventions of other Crops (Per Cent of Panchayats) in Hamirpur District of Himachal Pradesh (Block-wise)

Crops	Interventions	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Sugarcane								
1	Awareness & training programmes	100.00	100.00	100.00	83.33	80.00	100.00	92.86
2	Improved variety	0.00	0.00	0.00	33.33	40.00	0.00	14.29
3	Jaggery preparation technology	0.00	0.00	0.00	16.67	20.00	0.00	7.14
Floriculture								
1	Awareness programmes	60.00	75.00	50.00	83.33	60.00	75.00	67.86
2	Development of technology for the management of insect pest & diseases	60.00	50.00	50.00	50.00	40.00	75.00	53.57

Source: Field Survey, 2007-08

Table 5.35 Existing Schemes for Sericulture Development in Hamirpur District of Himachal Pradesh (Block-wise)

Block	No. of Schemes	Villages covered (No.)	Population covered (No.)	Area covered (Ha)	Beneficiary families (No.)	Status	
						Complete (No.)	Incomplete (No.)
Tauni Devi	3	195	3900	156	780	3	0
Hamirpur	3	180	3600	144	720	3	0
Bhoranj	3	110	2200	88	440	3	0
Nadaun	3	210	4200	168	840	3	0
Bijhari	3	225	4500	180	900	3	0
Sujanpur	3	195	3900	156	780	3	0
District	3	1115	22300	892	4460	3	0

Source: Field Survey, 2007-08

Chapter-VI

DISTRICT PLAN

The salient features like rainfall, temperature, location, population, literacy, soils, water resources, basic infrastructural facilities and on-going schemes of agriculture and allied departments have been documented and analysed with a view to develop future plan to accelerate agricultural growth in the district. The existing status of major farm components such as crop sector, livestock, horticulture, fisheries, sericulture and other farm and non-farm enterprises has been analysed with respect to productivity levels, problems and constraints and interventions needed to increase the overall production of agriculture sector. The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis with respect to natural resources and different farm components/practices of the district has been done to give deep insight into harnessing the available potential. The augmentation of natural resources through irrigation development and soil conservation and water harvesting along with the creation of necessary infrastructural facilities like rural roads, rural marketing network, etc. have been given prime importance for achieving the target growth rate of plus 4 per cent during the next five years. The present chapter gives financial estimates of the plan along with their sectoral and yearly allocations, new schemes/works that are proposed in the plan, projected growth rates of production of foodgrains, vegetables, fruit and milk, projected input requirement, growth drivers and vision for the plan.

6.1 Plan Estimates

The proposed plan has been designed to generate more than 4 per cent annual growth rate in agriculture sector. The sector-wise plan outlay and its distribution for the next five years have been presented in Table 6.1 The table indicates that the total plan outlay would be Rs 410.16 crores out of which about 10.19 per cent has been earmarked for addressing the crop related issues like promotion of seeds of high yielding varieties, improvement of soil health, protection of crops against biotic and abiotic stresses and promoting water use efficiency etc. Among different components of interventions to improve and enhance sustainability of crop production system, highest budget has been earmarked for protected cultivation (Rs.1478 lakhs) followed by improvement of crop productivity (Rs 650 lakhs) and improving the water use efficiency through micro-irrigation (Rs 1200 lakhs). The table reveals that in present plan highest priority has been given for natural resource management and infrastructural development. During the survey and the interaction with the farmers and district level planners, it was pointed out that marketing infra-structure, rural road connectivity, irrigation, soil and water conservation are key grass root level factors which promote the growth of the agriculture. Hence, a sizeable chunk of funds has been kept for development of irrigation and water harvesting through check dams, ponds and tanks which will increase the irrigation potential in the district and there will be diversification in the farming system through the commercial activities and enterprises. The varietal, technological and managerial gaps are the major constraints responsible for the low yields of different fruit crops. These issues need to be addressed by different technological and extension interventions for which an outlay of Rs 90 lakhs has been kept. This will boost the efficiency of huge investment which is being made under the Horticulture Technology Mission in the horticulture sector. Similarly, the plan outlay to the tune of Rs 837 lakhs has been proposed to address the issues of the livestock, poultry and fisheries component in the district. Over the five years

period, the plan outlay has been allocated in the proportion of 15 per cent for the first year of the plan, 20 per cent each for the next three years and the remaining 25 per cent is proposed to be spent in the fifth year of the plan.

6.2 New/Innovative Schemes

Keeping in view the natural resource potential of the district, preferences of unemployed rural youth, farming community, climatic conditions of the district and market demands and available technologies, there is a need for the popularization of commercial enterprises or schemes. Keeping these factors into consideration, protected cultivation of cash crops, mushroom production, poultry farming, organic farming, cultivation of medicinal plants, sericulture water harvesting and rural roads etc. have been identified as major potential enterprises/schemes for the development in the agriculture sector of the district. The details of these schemes in terms of villages covered, beneficiary families, potential area along with required funds are provided (Table 6.2) Among different districts of the state, the share of irrigated area is lowest in district Hamirpur. The irrigation plays a very crucial role in the adoption of cash crops like vegetables. Keeping this factor into consideration, new lift and *kuhl* irrigation schemes have been proposed. The block wise details have been given in Table 6.3. The table indicates that for the district as a whole there is a potential for 29 lift and 18 *kuhl* irrigation schemes which will have irrigation potential of 2,487 and 1,155 hectares, respectively.

6.3 Prioritisation of Different Schemes

During the survey, the matter regarding the prioritization and implementation of different schemes/works proposed in different sectors namely, agriculture, horticulture, animal husbandry were discussed in detail with the progressive farmers, panchayat representatives and stakeholders of line departments of the district. The activities of agriculture, horticulture and animal husbandry have been prioritized block wise and have presented in Table 6.4. The table reveals that among different activities of the agriculture sector, highest priority was given to irrigation followed by promotion of organic farming, protective measures against wild animals, monkeys and stray cattle menace, strengthening and quick transfer of technologies, timely availability of inputs such as seed, fertilizer and plant protection material. In case of horticulture, department is getting good response of farmers in case of protected cultivation of red and yellow capsicum under protected conditions. Therefore, highest priority was assigned to protected cultivation followed by mushroom cultivation as it can be grown throughout the year under natural climatic conditions i.e button mushroom in winter and dhingri and milky mushroom in summer. Other important priorities are establishment of micro-irrigations and diversification among fruit crops as mango is most affected by frost. Strengthening of diagnostic and clinical infrastructure, livestock product and marketing network, coverage of artificial insemination and breed improvement programme are the main priorities of the livestock component in the district.

6.4 Projected Outcomes, Growth Rates and Input Requirement

In the present plan, an attempt has been made to address the critical issues responsible for low yields of different components of farming systems based on field level gaps in the constraints related to existing extension as well as input distribution system. Commodity based varietal as

well as technological interventions have been proposed in synchronization with infra-structural support to obtain the potential yields in order to achieve the overall growth of agriculture sector above 4 per cent during the next five years. The key to achieve the desired results rests with the augmentation of land and water resources that offers opportunities for diversification and increasing the overall productivity of land resources. As is evident from Table 6.5 besides existing cultivated land, a potential of about 16,147 ha cultivable land and 14,323 ha of productive support land as well as 3,967 ha of support land exists which can be exploited through eradication of weeds and contouring fencing etc; for the production purposes. Similarly, activities/schemes have been proposed to create an irrigation potential of 3,642 ha by way of exploiting water resources available in the district through lift and kuhl irrigation while 8,840 ha through rain water harvesting will be created under the plan. Natural management strategy and creation of irrigation infra-structure coupled with the implementation of proposed interventions, the growth of different sub- sectors of agriculture is expected to achieve higher growth rates as compared to the existing scenario. With these assumptions and background, the sector wise outcomes of the proposed plan are presented in Table 6.6 to Table 6.10. The major outcomes of the plan are as under:

- Irrigation potential shall be created which will provide irrigation to an area of 12,482 hectares exploiting the available water resources and water harvesting through check dams, ponds and tanks etc. With the implementation of plan and creation of irrigation infrastructure, 33 per cent of the arable land will have assured irrigation facilities compared to existing 5 per cent.
- Available water potential shall be exploited and thereby 12,482 hectares of land shall be brought under cash crops by introducing vegetables in the traditional cropping systems, fruit plants and protected cultivation of red and yellow capsicum and flower plants.
- A huge chunk of land amounting to 11,287 hectares infested with soil erosion, stream bank erosion, etc shall be treated by adopting soil conservation measures.
- Support land (private grasslands) of 18,300 hectares shall be treated against invasive weeds and shrubs. This shall improve the fodder production to the approximate level of 1,830 metric tonnes.
- Foodgrain production shall increase from 1,09,236 metric tonnes to 1,36,805 metric tonnes after the implementation of the plan recording a growth rate of 5.05 per cent per annum in scenario I. In scenario II when 20 per cent of irrigated land is shifted to vegetable production, the growth rate in foodgrain production shall be 2.94 per cent per annum (Table 6.6).
- Production of vegetables would increase from 32,239 metric tonnes to 67,628 metric tonnes in scenario I registering a growth rate of 21.95 per cent per annum when the proportion of area under these crops remains same and to 1,53,102 metric tonnes recording a growth rate of 74.98 per cent per annum in scenario II when 20 per cent of the irrigated area is brought under these crops. This will generate a marketable surplus of 1, 37,792 metric tonnes which in monetary terms amounts to Rs. 137.79 crores. The

market disposal of this surplus shall generate huge employment opportunities for rural unemployed youth through forward and backward linkages.

- Based on the yields of average farmers and that of progressive farmers of different crops along with the current area under different crops collected during field survey, the projected production of different crops have been worked out (Table 6.7). The growth rate over the existing production in case of cereals, pulses and oilseed crops have been estimated at 6.05 per cent, 10.73 per cent and 6.56 per cent per annum, respectively. Among cereals, highest growth is possible in barley (8.88 per cent) followed by wheat (8.21 per cent). Among pulses, mash registered the highest growth of 11.21 per cent followed by gram. The overall growth in foodgrains would be 6.06 per cent per annum. The annual growth in production of vegetables would be 6.45 per cent in which highest growth is expected in colocasia (16.86 per cent) followed by ginger (13.70 per cent), onion (12.00 per cent) and bitter gourd (11.07 per cent).
- Mango, citrus, guava and aonla are traditionally grown fruits in the district where as pomegranate, litchi, plum, peach and pear have been newly adopted. Based on yields of progressive farmers and the yield of the average farmer, the production of different fruits is expected to register higher growth rates i.e 15.73, 13.96, 11.74, 11.12 per cent in case of mango, guava, citrus and aonla, respectively. In case of newly adopted fruits, the annual growth was found highest in case of pomegranate (83.95 per cent) followed by peach (29.54 per cent) and plum (20.70 per cent). The growth in case of pomegranate is higher because it is resistant to insect pest and diseases and less perishable as compared to others. (Table 6.8)
- Through the implementation of plan, the milk production in the district is expected to increase from the existing level of 246.7 thousand liters per day to 455.31 thousand liters per day from different livestock categories. Among the different categories, the expected increase in milk yield would be 18.40, 9.95 and 6.72 per cent in case of buffales, crossbred cows and local cows, respectively (Table 6.9).
- The demand for different types of fertilisers like CAN, UREA, IFFCO (12:32:16), SSP and MOP has been projected to increase to 2,62.20, 6,951.30, 1,343.92, 41.64 and 123.25 metric tonnes, respectively by the year 2012-13 under scenario I. Under scenario II, the demand for these fertilisers has been projected to increase at 312.33, 8,403.16, 1,628.89, 50.44 and 141.35 metric tonnes, respectively. And in scenario III, it has been projected to increase to 370.92, 10,122.45, 1,967.15, 60.88 and 161.80 metric tonnes, respectively. The projections for different fertilisers have been given in Table 6.11.
- The projected sectoral growth rates would be 6.51 per cent for agriculture, 15.09 per cent for horticulture and 16.91 per cent for animal husbandry. The overall agricultural growth rate has been projected at 11.98 per cent per annum during the plan period (Table 6.10).

6.5 Growth Drivers

The agro-climatic conditions of the district offer congenial conditions to grow cash crops like vegetables, mushrooms, quality silk worm, fruits etc; as off-season crops for the distant markets. Tremendous scope of diversification in the cropping systems for cash crops, huge demand in local and distant markets for vegetables, higher price incentives for local produce both in local and distant market, available technologies for growing different crops are the key growth drivers. By observing the malpractices and adulteration in processed milk and milk products, there exists a huge potential for local produced milk and milk products itself for creating a potential for the growth of animal husbandry sector in the district. The population of un-employed educated youth, who are keen to adopt the farming on scientific commercial lines apart from traditional farming is increasing. This may play a leading role in taking these potential enterprises as source of their livelihood especially vegetable/ mushroom/protective farming. The provision of basic infrastructural facilities especially irrigation is the important growth driver for different sectors. The development and diffusion of new agricultural technologies to increase yield levels, eradicate weeds to improve the productivity of support and pasture lands and reduce the cost of cultivation is a *sine qua non* for realising the rich potential available in the district.

6.6 Vision of Next Plan

The proposed plan in its true sense strikes on the existing constraints at grass root level, critically examines the gaps in technology adoption with respect to input use and focuses on bridging the yield gaps through suitable technological interventions by ensuring the creation of infra-structural base to support the production levels by scientific management and exploitation of natural resources for higher growth rates. It has also stressed upon the need for providing adequate technical manpower to cater to the needs of the farming community in growth and sustainability of potential enterprises during the plan period and in future. Research and development is a continuous process which needs regular assessment and refinement in technology. In view of this, the location specific researchable issues of the district have been identified and funds for refinement have been earmarked to address the specific problems with respect to technology. The plan is open ended in the sense that it offers sizeable growth for the practising farmers growing traditional crops as well as to the young educated farmers who adopt agriculture as a major occupation by way of adopting potential commercial enterprises especially protected cultivation, flowers and vegetables, poultry and mushroom cultivation etc.

Although district is well connected to rest of the districts and states through the road network, yet a provision has been made to improve the connectivity in the rural areas to avoid the lapses in the input procurement and disposal of produce. The situation of managing natural resources especially common property resources with respect to land and water is not proper in the district. The common and supporting lands have been infected with obnoxious weeds and available water resources have not been exploited for which the provision has been made in the present plan. The potential and promising enterprises have been proposed by conducting systematic surveys in the field by deploying highly technical teams based on respondents' opinions, SWOT analysis and keeping in view the future demand and market perspectives under local situations. The district has a potential to emerge as a leading producer of maize and has a potential to support maize-based agro industries. The harnessing of irrigation potential both through irrigation schemes like

flow irrigation and water harvesting through watershed development shall go a long way in reducing risks and stabilising the production of different crops. In toto, the provisions made in the current plan focuses on the holistic development of agriculture sector on sustainable basis through diversification. The overall growth rate through the implementation of plan is expected to be beyond 5 per cent per annum vis-à-vis potential of creating job avenues for on-farm as well as non-farm enterprises through different interventions and activities.

Although the plan is holistic in its approach, contents, outcomes and is based on future perspective under some assumptions, yet, future is always unforeseen and uncertain. This globe is facing lot of changes in different spheres. The most apparent is climate change, which may threaten the viability of existing plant species and require other species or there may be emergence of new insect, pest and diseases due to climate change. The other changes may include the development of efficient agricultural technology while the proposed technology may loose its economic viability. In present era, market is very volatile and similar products may be made available to the consumers at lower rates. Such exogenous factors are beyond the control of current plan which may be taken up by supplementary or new plan as per the situation and available technology domain.

Table 6.1 District Agricultural Plan: Sectoral Outlays and Yearly Allocation (Rs. Lakhs)

Sr. No.	Schemes	Total plan outlay	Yearly Allocation				
			I	II	III	IV	V
I	Interventions to Improve and Enhance Sustainability of Crop Production System	2839	425.85	567.8	567.8	567.8	709.75
1	Improvement of productivity of cereals, pulses, oilseeds, vegetables and spices crops through promotion of HYV seeds including hybrids	650	97.5	130	130	130	162.5
2	Improvement of soil health through vermi-composting, bio-fertilizers, micro nutrients, soil testing etc.	375	56.25	75	75	75	93.75
3	Protection of crops against biotic stresses (diseases, pests, weeds) and abiotic stresses (hailstorms, drought, flash floods, etc) and other risk factors	100	15	20	20	20	25
4	Water use efficiency through micro irrigation	600	90	120	120	120	150
	(i) Sprinkler	550	82.5	110	110	110	137.5
	(ii) Drip	50	7.5	10	10	10	12.5
5	Agricultural mechanization through popularization of improved tools and hill specific machinery like power tillers, tractors, crop planters/ harvesters, sprayers, clod breakers and gender friendly post harvesting equipments to remove women drudgery	350	52.5	70	70	70	87.5
6	Protected (poly house) cultivation to minimize risk factors and enhance quality and productivity	1478	222	295	296	295	370
7	Strengthening and improvement of quality control infrastructure (seed, pesticides and fertilizer testing laboratories)	15	2.25	3	3	3	3.75
8	Strengthening of seed production farms and promotion of infrastructure to improve seed production and replacement	10	1.5	2	2	2	2.5
II	Need Based Infrastructure Development	8111	1216.7	1622.2	1622.2	1622.2	2027.75
1	Irrigation	5175	776.25	1035	1035	1035	1293.75
2	Improvement of on-farm water delivery and efficiency of existing irrigation systems	586	87.9	117.2	117.2	117.2	146.5
3	Rural markets	695	104.25	139	139	139	173.75
4	Rural roads for connectivity	1655	248.25	331	331	331	413.75
III	Natural Resource Conservation and Management	24291	3643.7	4858.2	4858.2	4858.2	6072.75
1	Soil conservation of arable and non-arable land through engineering measures	909	136.35	181.8	181.8	181.8	227.25
2	Water harvesting check dams, ponds, tanks, etc	22100	3315	4420	4420	4420	5525
3	Land improvement	1282	192.3	256.4	256.4	256.4	320.5

IV	Niche Based Enterprises for Rural Entrepreneurs	1248	187.2	249.6	249.6	249.6	312
	(i) Organic farming	140	21	28	28	28	35
	(ii) Mushroom	768	115.2	153.6	153.6	153.6	192
	(iii) Sericulture	11	1.65	2.2	2.2	2.2	2.75
	(iv) Agro-tourism	315	47.25	63	63	63	78.75
	(v) Medicinal and aromatic plants	14	2.1	2.8	2.8	2.8	3.5
V	Fruit Production	90	13.5	18	18	18	22.5
VI	Livestock, Poultry & Fisheries	837	125.55	167.4	167.4	167.4	209.25
1	Livestock improvement	725	108.75	145	145	145	181.25
2	Poultry	89	13.35	17.8	17.8	17.8	22.25
3	Fisheries	23	3.45	4.6	4.6	4.6	5.75
VII	Human Resource Development	1679	251.85	335.8	335.8	335.8	419.75
1	Additional man power requirement	1136	170.4	227.2	227.2	227.2	284
2	Capacity building of extension personnel	543	81.45	108.6	108.6	108.6	135.75
VIII	Research & Extension	562	84.3	112.4	112.4	112.4	140.5
IX	All Sectors & Schemes	39657	5948.6	7931.4	7931.4	7931.4	9914.25

Table 6.2 New Schemes for Agricultural Development for Hamirpur Distict of Himachal Pradesh (Block-wise)

Block	No. of Schemes	Villages (No.)	Beneficiary families (No.)	Potential area (Ha)	Funds required (Rs Lakh)
Water harvesting schemes including ponds, check dams, tanks, etc					
Tauni Devi	1	30	240	1000	2500
Hamirpur	1	42	350	1400	3500
Bhoranj	1	15	120	2000	5000
Nadaun	1	50	380	2500	6250
Bijhari	1	45	270	1500	3750
Sujanpur	1	22	195	440	1100
District	1	204	1555	8840	22100
Soil/land conservation schemes					
Tauni Devi	1	4	40	40	20
Hamirpur	1	80	990	700	350
Bhoranj	1	50	310	350	175
Nadaun	1	20	740	165	82.5
Bijhari	1	75	365	462	231
Sujanpur	1	16	410	100	50
District	1	245	2855	1817	908.5
Fruit production schemes					
Tauni Devi	1	40	495	61	18.3
Hamirpur	1	50	335	45	13.5
Bhoranj	1	40	350	43	12.9
Nadaun	1	40	650	60	18
Bijhari	1	50	435	55	16.5
Sujanpur	1	40	290	36	10.8
District	1	260	2555	300	90
Sericulture schemes					
Tauni Devi	1	15	80	7	1.4
Hamirpur	1	15	70	6	1.2
Bhoranj	1	32	165	13	2.6
Nadaun	1	17	90	7	1.4
Bijhari	1	20	110	9	1.8
Sujanpur	1	32	155	12	2.4
District	1	131	670	54	10.8
Livestock improvement schemes					
Tauni Devi	2	110	440	-	110
Hamirpur	2	115	460	-	115
Bhoranj	2	85	340	-	85
Nadaun	2	175	700	-	175
Bijhari	2	160	640	-	160
Sujanpur	2	80	320	-	80
District	2	725	2900	-	725

Rural roads (Kms)					
Tauni Devi	1	35	2100	-	150
Hamirpur	1	50	3000	-	165
Bhoranj	1	40	2400	-	200
Nadaun	1	35	2100	-	130
Bijhari	1	60	3600	-	150
Sujanpur	1	35	2100	-	140
District	1	255	12750	-	935
Bridges (No.)					
Tauni Devi	1	15	900	-	80
Hamirpur	1	25	1500	-	100
Bhoranj	1	30	1800	-	160
Nadaun	1	35	2100	-	120
Bijhari	1	32	1920	-	160
Sujanpur	1	25	1500	-	100
District	1	162	9720	-	720
Rural markets					
Tauni Devi	1	5	25000	-	25
Hamirpur	1	5	27500	-	25
Bhoranj	1	6	30000	-	35
Nadaun	1	12	60000	-	60
Bijhari	1	7	35000	-	35
Sujanpur	1	5	25000	-	25
District	2	40	202500	-	205
Protected cultivation					
Tauni Devi	1	220	880	35.2	246.4
Hamirpur	1	120	480	19.2	134.4
Bhoranj	1	150	600	24	168
Nadaun	1	300	1200	48	336
Bijhari	1	350	1400	56	392
Sujanpur	1	180	720	28.8	201.6
District	1	1320	5280	211.2	1478.4
Organic farming					
Tauni Devi	1	30	450	300	30
Hamirpur	1	15	225	150	15
Bhoranj	1	15	225	150	15
Nadaun	1	15	225	150	15
Bijhari	1	20	300	200	20
Sujanpur	1	45	675	450	45
District	1	140	2100	1400	140
Agro-tourism					
Tauni Devi	1	6	30	-	45
Hamirpur	1	8	40	-	60

Bhoranj	1	5	25	-	38
Nadaun	1	9	45	-	68
Bijhari	1	8	40	-	60
Sujanpur	1	6	30	-	45
District	1	42	210	-	315
Medicinal and aromatic plants					
Tauni Devi	1	15	75	9	3
Hamirpur	1	10	50	6	2
Bhoranj	1	10	50	6	2
Nadaun	1	15	75	9	3
Bijhari	1	15	75	9	3
Sujanpur	1	15	75	9	3
District	1	80	400	48	14
Mushroom production					
Tauni Devi	1	250	500		125
Hamirpur	1	190	380		95
Bhoranj	1	202	404		101
Nadaun	1	424	848		212
Bijhari	1	311	622		155.5
Sujanpur	1	158	316		79
District	1	1535	3070		767.5
Poultry farming					
Tauni Devi	1	75	100		20
Hamirpur	1	62	75		15
Bhoranj	1	60	60		12
Nadaun	1	95	95		19
Bijhari	1	110	110		22
Sujanpur	1	45	45		9
District	1	447	447		89.4

Source: Field Survey, 2007-08

Note : * In addition to this Rs 490 lakh have been proposed for the development of marketing infra-structure of livestock sector thus the total provision comes to Rs 695 lakh.

**Table 6.3 New Irrigation Schemes for Hamirpur Distict of Himachal Pradesh
(Block-wise)**

Particulars	Tauni Devi	Hamirpu r	Bhoran j	Nadau n	Bijhar i	Sujanpu r	Distric t
Lift irrigation							
Number	4	4	5	5	6	5	29
Amount required (Rs. Lakh)	225	187.5	375	1593	300	1050	3730.5
Villages to be covered (No.)	5	6	5	8	6	6	36
Beneficiaries (No.)	225	125	200	340	120	240	1250
Command area (ha)	150	125	250	1062	200	700	2487
Kuhl							
Number	4	2	4	4	2	2	18
Amount required (Rs. Lakh)	312	219	206	350	138	219	1444
Villages to be covered (No.)	5	3	7	7	2	4	28
Beneficiaries (No.)	200	80	300	266	90	150	1086
Command area (ha)	250	175	165	280	110	175	1155

Source: Field Survey, 2007-08

Table 6.4 Prioritizations of Different Schemes for Hamirpur District of Himachal Pradesh (Block-wise)

Sector	Schemes	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
Agriculture	Utilization of created water potential and creation of additional water resources for irrigation	1	1	1	1	1	1	1
	Diversification through cash crops and protected cultivation	7	7	3	7	7	7	7
	Promotion of organic farming	2	3	2	2	2	5	2
	Strengthening and quick transfer of technologies	4	4	4	4	3	6	4
	Timely availability of inputs	5	5	6	5	4	2	5
	Strengthening /establishment of seeds storage and grading facilities	6	6	5	6	5	4	6
	Protective measures against wild animals, monkeys and stray cattle	3	2	7	3	6	3	3
	Protected cultivation	1		1	1	1	1	1
	Diversification among fruits	4		4	4	4	4	4
	Promotion of cultivation of mushroom	2		2	2	2	2	2
Horticulture	Establishment of micro irrigation systems	3		3	3	3	3	3
	Power and manual operated suitable equipments	6		6	6	6	6	6
	Cold storage facilities at district level	5		5	5	5	5	5
	Strengthening of diagnostic and clinical infrastructure	1		1	1	1	1	1
	Increasing coverage of artificial insemination and breed improvement programme	3		3	2	2	2	2
Animal Husbandry	Livestock product and marketing network	2		2	3	3	3	3
	Promotion of backyard and commercial poultry farming	4		4	4	4	4	4

Source: Field Survey, 2007-08

Table 6.5 Augmentation of Land and Water Resources: Physical Targets (Ha) in Hamirpur Distict of Himachal Pradesh (Block-wise)

Blocks	Cultivated land	Potential cultivable land	Productive support land	Potential support land	Potential irrigated land	Irrigation potential through water harvesting
Tauni Devi	6201	6469	2402	1411	400	1000
Hamirpur	3900	310	2316	286	300	1400
Bhoranj	6121	645	2660	296	415	2000
Nadaun	7394	5108	2455	304	1342	2500
Bijhari	11129	1800	2993	370	310	1500
Sujanpur	2881	1815	1497	1300	875	440
District	37626	16147	14323	3967	3642	8840

Source: Consultant's own calculations

Table 6.6 Projected Output of Foodgrains and Vegetable Crops for Hamirpur Distict of Himachal Pradesh

Crops	Existing			Potential Production (Mt)		Growth rate (% p.a.)	
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Scenario I	Scenario II	Scenario I	Scenario II
Maize	31721	62860	19.82	78049	71431	4.83	2.73
Paddy	2417	2528	10.46	3515	3249	7.82	5.71
Wheat	33641	43733	13.00	54782	50178	5.05	2.95
Barley	77	79	10.30	98	89	4.61	2.51
Pulses	70	49	7.01	60	55	4.61	2.51
Foodgrains	67933	109236	16.08	136805	125305	5.05	2.94
Vegetables	1499	32239	215.00	67628	153102	21.95	74.98

Note : Scenario I- output growth with increased irrigated area and crop improvement programmes

Scenario II- output growth with diversion of 20 % irrigated area to high value cash crops

Table 6.7 Projected Output and Growth Rate in the Production of Different Agricultural Crops in Hamirpur Distict of Himachal Pradesh

Crops	Existing			Potential			Growth rate in production (% p.a)
	Area (Ha)	Production (Mt)	Yield (Q/h)	Area (Ha)	Production (Mt)	Yield (Q/ha)	
Cereals	69461	138235	19.90	69461	180055	25.92	6.05
Maize	32706	76668	23.44	32706	94324	28.84	4.61
Paddy	1949	4195	21.52	1949	4814	24.70	2.95
Wheat	34620	57149	16.51	34620	80595	23.28	8.21
Barley	186	223	11.99	186	322	17.30	8.88
Pulses	585	330	5.64	585	507	8.67	10.73
Mash	352	173	4.91	352	270	7.68	11.21
Gram	219	151	6.89	219	229	10.45	10.33
Lentil	14	6	4.29	14	8	5.98	6.67
Foodgrains	70046	138565	19.78	70046	180562	25.78	6.06
Oilseeds	384	183	4.77	384	243	6.33	6.56
Sesame	116	32	2.76	116	43	3.69	6.88
Sarson	37	18	4.86	37	26	6.92	8.89
Toria	174	96	5.52	174	124	7.15	5.83
Gobhi Sarson	57	37	6.49	57	50	8.84	7.03
Vegetables	2886	33744	116.92	2886	44630	154.64	6.45
Tomato	92	2753	299.24	92	3157	343.17	2.93
Peas	117	916	78.29	117	1190	101.67	5.98
Bhindi	484	3472	71.74	484	4324	89.33	4.91
Cucumber	166	2904	174.94	166	3392	204.33	3.36
Bottle gourd	129	2501	193.88	129	3100	240.33	4.79
Bittergoard	103	916	88.93	103	1423	138.17	11.07
Brinjal	69	1244	180.29	69	1625	235.50	6.13
Capsicum	61	1115	182.79	61	1389	227.67	4.91
Cabbage	97	1396	143.92	97	1964	202.50	8.14
Cauliflower	215	3173	147.58	215	3759	174.83	3.69
Colocasia	261	2549	97.66	261	4698	180.00	16.86
Onion	246	2565	104.27	246	4104	166.83	12.00
Others	846	8240	97.40	846	10505	124.17	5.50
Spices	177	1412	79.77	177	2143	121.07	10.35
Ginger	75	495	66.00	75	834	111.17	13.70
Garlic	102	917	89.90	102	1309	128.33	8.55

Source: Field Survey, 2007-08

Note: Projections are based on the estimated average yields and yields obtained by the progressive farmers

Table 6.8 Projected Output Growth in Fruit Production in Hamirpur Distict of Himachal Pradesh

Particulars	Existing			Potential			Growth rate in production (% p.a.)
	Area (Ha)	Production (Mt)	Yield (Q/ha)	Area (Ha)	Production (Mt)	Yield (Q/ha)	
Mango	2730	2117	7.76	3655	5447	14.91	15.73
Citrus	1414	853	6.04	2007	1855	9.24	11.74
Guava	149	133	8.89	264	318	12.03	13.96
Pome granate	94	38	4.01	609	354	5.82	83.95
Litchi	261	131	5.02	316	264	8.34	10.12
Amla	216	146	6.77	341	309	9.06	11.12
Plum	154	38	2.50	244	118	4.84	20.70
Peach	109	57	5.23	304	226	7.42	29.54
Pear	116	111	9.56	211	279	13.18	15.04
Others	463	171	3.70	626	366	5.85	11.40

Note: i. Projections are based on the estimated average yields and yields obtained by the progressive farmers
ii. For computation of growth rates, 10 years period was taken for harnessing the potential production

Table 6.9 Projected Output Growth in Milk Production in Hamirpur Distict of Himachal Pradesh

Particulars	Existing			Potential			Growth rate in production (% p.a.)
	Milch animals (No.)	Production (000 L/day)	Milk Yield (L/day)	Milch animals (No.)	Production (000 L/day)	Milk Yield (L/day)	
Crossbred cows	10595	35.96	6.17	10095	53.86	9.70	9.95
Local cow	2344	2.44	2.08	2000	3.26	3.26	6.72
Buffalo	101538	205.09	4.07	99038	393.76	7.95	18.40
Goats	29641	3.21	0.43	29641	4.43	0.60	7.59

Note : Projections are based on the estimated average yields and yields obtained by the progressive farmers

Table 6.10 Projected Value of Output and Growth of Agriculture and Allied Sectors for Hamirpur Distict of Himachal Pradesh

Sector	Current value of output (Rs. Lakh)	Projected value of output (Rs. Lakh)	Growth rate (% p.a.)
Agriculture	13855	18363	6.51
Horticulture	506	1270	15.09
Animal husbandry	13507	24928	16.91
Over-all	27868	44561	11.98

Note : Projections are based on the estimated average yields and yields obtained by the progressive farmers and farm gate prices of different commodities.

Table 6.11 Fertiliser Demand, Actual Supply and Projections for 2012-13 (M.T.) for Hamirpur District of Himachal Pradesh.

Year	CAN		UREA		IFFCO (12:32:16)		SSP		MOP	
	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply
2003-04	75	56.5	4500	4428.8	1000	838.72	30	25.6	5	3
2004-05	80	47.75	5000	4857.65	1100	1028.9	32	30.35	5	2.8
2005-06	82	11.65	5000	4949.65	1100	974.46	32	3.25	5	2.7
2006-07	80	0.95	5000	4426.05	1100	845.55	35	16.705	10	6.65
2007-08	125	12.55	5500	5054.4	1150	695.8	35	24	20	9.75
Growth rate (% p.a)	13.33	-15.56	4.44	2.83	3.00	-3.41	3.33	-1.25	60.00	45.00
Projection for 2012-13 at normal growth rate	262.20	10.41	6951.30	5851.66	1343.92	592.96	41.64	22.57	549.76	123.25
Projection making allowance for crop diversification @ 2 % above normal growth rate	312.33	13.16	8403.16	7094.81	1628.89	727.83	50.44	27.59	622.47	141.35
Projection making allowance for irrigation@ 2 % over diversification	370.92	16.54	10122.45	8570.79	1967.15	889.71	60.88	33.58	703.73	161.80

Note: IFFCO (12:32:16) also includes the supply of IFFCO (15:15:15) and IFFCO (10:26:26)

Source: (i) Data on Demand and Supply of fertilisers from the Office of Deputy Director Agriculture, Hamirpur
(ii) Projections by the consultant following the methodology adopted by Fertiliser Association of India, New Delhi

Appendix 1 Demographic and Institutional Features for Hamirpur Distict of Himachal Pradesh (Block-wise)

Sr. No.	Particulars	Tauni Devi	Hamirpur	Bhoranj	Nadaun	Bijhari	Sujanpur	District
1	Gram panchayats (No.)	46	24	33	58	48	20	229
2	Villages (No.)	258	198	227	447	353	214	1697
3	Households (No.)	15032	8204	15574	17971	18521	1070	76372
4	Total population							
	Male	31787	19414	33470	41869	40084	16425	183049
	Female	36115	20890	37550	46805	44822	18434	204616
	Schedule caste	16634	9597	20415	18136	20425	9455	94662
	Schedule tribe	53	26	0	1	110	0	190
	Rural	67902	23052	71020	84269	83434	0	329677
	Urban	0	17252	0	4405	1472	0	23129
	Sex ratio	1148	1076	1122	1118	1122	1121	1117.83
5	Literacy rate (%)							
	Male	90.73	90.6	90.2	90.38	89.39	87.3	89.7667
	Female	75.03	77.26	74.44	75.7	74.71	71.93	74.845
	Schedule caste	70.5	75.7	28.75	65.68	0	0	40.105
	Schedule tribe	65.78	74.44	0	100	0	0	40.0367
6	Households economic status							
	Antodaya households	2348	1315	2659	0	1588	873	8783
	BPL households	3546	1984	4014	6305	2398	1317	19564
	APL1 households	2483	6494	11560	4000	0	1120	25657
	APL2 households	6655	1449	0	0	0	0	8104
7	Village amenities (No.)							
	Connected with pucca roads	185	96	180	400	209	0	1070
	Connected with kuchha roads	14	45	27	47	74	0	207
	Connected with no roads	59	56	20	0	70	0	205
	Drinking water supply	258	197	224	447	16	0	1142
	Villages electrified	258	197	224	442	353	1276	2750
	Tel connection to panchayats	46	0	6414	9862	0	4	16326
	Post office	43	19	40	47	52	18	219

10	Any other	0	10	33	0	0	0	2	45
	Banking institutions (No.)								
	Commercial banks	7	4	8	11	15	6	6	51
	RRBs	0	0	0	0	0	0	0	0
	Central co-operative banks	2	3	2	6	2	3	3	18
	Co-operative credit societies	32	26	70	94	43	25	25	290
	Any other	0	3	2	0	0	0	0	5

Appendix II Farm Gate Prices of Different Crops

Sr. No.	Particulars	Price (Rs./q)
A	Cereals	
1.	Maize	650
2.	Paddy	850
3.	Wheat	1000
4.	Barley	1500
B	Pulses	
1.	Mash	3500
2.	Gram	3000
3.	Lentil	3500
C	Oilseeds	
1.	Sesame	4500
2.	Sarson	3000
3.	Toria	3000
4.	Ghobhi sarson	3000
D	Vegetables	
1.	Potato	400
2.	Peas	1500
3.	Tomato	700
4.	Cabbage	400
5.	Cauliflower	600
6.	Beans	800
7.	Capsicum	1800
8.	Bitter gourd	900
9.	Bhindi	800
10.	Brinjals	500
11.	Cucurbits	700
12.	Onion	500
13.	Ginger	2000
14.	Garlic	2500
E	Fruits	
1.	Mango	1000
2.	Citrus	2000
3.	Guava	1500
4.	Pomegranate	2500
5.	Litchi	2500
6.	Amla	1200
7.	Plum	1200
8.	Peach	1000
9.	Pear	1500
10.	Others	1000
F	Milk	1500
G	Fish	5000

