

CHAPTER 1

INTRODUCTION

Prior to the year 1969, Soil Conservation works in the state were carried out by the Soil Conservation Wing of the Agriculture Department. Then its status was raised and was made an independent Department by the Punjab Government. It was named as "SOIL CONSERVATION AND ENGINEERING DEPARTMENT" and the head of the department was designated as "Chief Conservator of Soils Punjab. The name of the department was changed as "DEPARTMENT OF SOIL AND WATER CONSERVATION AND WASTE LAND DEVELOPMENT, PUNJAB" by the government in February 1993. During 2000 the name of the department was again changed as "DEPARTMENT OF SOIL AND WATER CONSERVATION, PUNJAB" This is the 40th Annual Report on the working of this department. Sh. Anil Kumar Sondhi held the charge of Chief Conservator of Soils, Punjab during the year 2008-09 w.e.f. 01-10-2008.

The Annual Report highlights activities and achievements of the department during the year 2008-09 which are summarized as follows:-

Soil and Water are two natural resources and the successful crop production depends upon the way, how best we utilize these two resources. The main objective is to conserve Soil and Water resources for their judicious use to obtain optimum return on sustained basis. On the basis of Soil and Water management programme, the State can be divided in to 3 Agro-climatic zones.

1. NORTHERN ZONE:

This is located in the foothills of Shivaliks and extends from Derabassi block of Mohali district to Dhar block of Gurdaspur district falling in Ropar, Mohali, Fatehgarh Sahib, Hoshiarpur and Gurdaspur districts. Soil erosion due to flash floods and droughts are common features of this zone. The following Soil and Water Conservation works are undertaken in this region:

- i) Water harvesting structures are constructed to control flash flood and supplementary irrigation is provided to command area.
- ii) Undulating lands are being terraced and leveled.
- iii) Tapping of perennial flow (Makkowal Type) and lift irrigation.
- iv) Drainage line treatment.
- v) In the rainfed area of Kandi, Centrally Sponsored Scheme for rainfed agriculture is being executed.
- vi) Treatment of Catchment area of Thein Dam.
- vii) Treatment of Catchment area of river Ghaggar.
- viii) Ground Water Recharge.
- ix) Micro Irrigation.
- x) Reclamation of degraded land

2. CENTRAL ZONE:

It is comprises of Patiala, Ludhiana, Jalandhar, Nawanshahar, Kapurthala and Amritsar districts. This zone is the most developed area of the State. The lands are leveled and under ground water are available for irrigation. The over

exploitation of sub-soil water is causing ground water depletion in this zone at an alarming rate. In this zone following works are being undertaken:-

- i) Modernization of irrigation conveyance system on individual tube wells. An underground pipeline system is laid to save water losses in conveyance.
- ii) Reclamation of alkaline/saline and water logged area providing agricultural drainage.

- iii) Reclamation of degraded land and Ravine reclamation works are being carried out in area affected by river Beas, Ravi, Sutlej and many other tributaries which join these rivers.
- iv) Micro Irrigation.
- v) Budha Nullah and Kali Bein projects.

3. SOUTHERN ZONE

This comprises Sangrur, Barnala, Bathinda, Mansa, Mukatsar, Moga, Faridkot and Ferozepur districts. In this region the sub soil water is generally brackish and unfit for irrigation. Irrigation water is available from network of canal system which has been carried to the fields by constructing lined water courses and also through under ground pipe line system. Sand dunes in this region have been reclaimed by scrapping of sand to bring out the good soil below it for agricultural purposes. Micro Irrigation, reclamation of degraded land and community under ground pipe line projects are also carried out in these areas.

Apart from above the Soils Survey wing of the Department is engaged in collection of field information of soils, mapping of soils and in preparing the recourse inventory in the state. Different type of Soil Survey i.e detailed soil survey, semi-detailed survey, reconnaissance survey etc. are conducted.

Machinery Division: The Department has a fleet of 7 bulldozers, 1 Excavator cum Loader, 8 Tractors, 1 Trenchers and 6 Laser levelers for undertaking various soil and water conservation works in the state. There is separate division for running and maintenance of machinery working under Divisional Soil Conservation Officer with its head quarter at Mohali.

Training Institute: There is a Training Institute at Mohali to impart training to farmers and Technical persons upto the level of Soil Conservation Officers. The courses cover all the practical aspects of Soil & Water Conservation works such as land leveling, bench terracing, contour bounding, gully reclamation, water harvesting dams and drainage etc and also give lessons of practice in preparation of plan & estimates etc.

State Land Use Board: A nucleus cell i.e. Land Use Board has been created to assess the land resources like soil, water & vegetation and is responsible for maintaining a soil inventory, to keep liaison with other departments and organizations connected with land use and for generating awareness for optimum & judicious use of soil & water resources in the State

CHAPTER-II

ORGANISATION AND ACTIVITIES

The Soil and Water Conservation Department, Punjab is headed by the Chief Conservator of Soils, Punjab. During the year there were functioning three Circles and 14 works Divisions covering the entire State. The 14 works divisions have 43 works Sub Divisions with supporting staff. For the in-service training of the subordinate staff, there is Training Institute at Mohali under the charge of another Divisional Soil Conservation Officer. Besides this, there is one Soil Survey Division for Soil Survey work in the State under the charge of Divisional Soil Conservation Officer (Soil Survey) with headquarters at Mohali. Under Divisional Soil Conservation Officer, (Soil Survey) there are three Soil Survey Officers with head quarters at Ludhiana, Hoshiarpur and Mohali. Each works as Incharge of 5 Soil Survey parties. There is a separate Division for running and maintenance of Bulldozers, Tractors, Motor graders and Laser Levelers under the charge of the Divisional Soil Conservation Officer, (Machinery) with head quarter at Mohali. One Conservator works as Director (Technical) (SLUB) Punjab, head the State Land Use Board at Mohali.

Organization chart of the Department for the year 2008-09 is given in annexure `A`.

ACTIVITIES OF THE DEPARTMENT:

In the State of Punjab, the alarming depleting ground water in the Central Punjab, the soil degradation due to soil erosion in shivalik foothills, water logging and salt affected soils in the south-western Punjab and micro-nutrient imbalance in major parts are the important focused areas. This implies that there is great need for land treatment and water management works. Water management works conserve water by checking seepage losses, thus creating more irrigation potential by which further area can be brought under irrigation. There is need for laying of under ground pipe line in the Southern and Central Districts. For efficient use of irrigation water the Micro Irrigation (Drip/Sprinkler) system is being promoted. In addition to it Rain Water Harvesting structures, Makowal type structures and small lift irrigation projects are constructed for ground water storage, supplementary irrigation and erosion control. Also there is scope for the development of land already under cultivation by carrying out land leveling, land shaping and bench terracing works.

The following types of works are executed by the department under various schemes of Soil Conservation and Water Management works.

1. Laying of underground pipe line for irrigation on tube wells/canal outlet.
2. Land leveling/land grading/Chisling of soil.
3. Gully reclamation and soil erosion control works on watershed basis.
4. Water harvesting dam/Makowal type water harvesting structure.
5. Lift irrigation/Perennial Flow Structure.
6. Rain Water Harvesting & Ground Water Recharging.
7. Improvement of ecological & degraded lands.
8. Tapping of treated sullage water for irrigation.
9. Promotion of Sprinkler/Drip irrigation system.
10. Soil survey works.

Land Development & water management works are being executed by the department under the State Plan Schemes and Centrally sponsored schemes mentioned below.

STATE PLAN SCHEMES :-

1. SWC-4 Soil & Water Conservation on watershed basis

This scheme is operative in the kandi area of the State. The scheme envisages the development of watersheds by various types of land development and water management works. Land treatment works like bench terracing, land leveling and gully reclamation have been done as anti-erosion and water conservation measures. For the efficient use of water, water harvesting structures, Makkowal type water harvesting and small lift irrigation schemes are constructed and laying of underground pipe lines for conveyance of water from the source to the field are carried out. Under this scheme the outlay was Rs. 100.00 lacs. The whole amount was utilized by benefiting an area of 980 hectares during the year 2008-09.

2. SWC-5 Provision of Machinery Division at Head Quarter

The scheme was started during the year 1990-91. Under this, at present a fleet of 7 bulldozers, one excavator-cum-loader, 8 tractors, 1 trencher and 6 laser levelers is maintained for execution of various soil and water conservation works in the state. A machinery division headed by Divisional Soil Conservation Officer looks after this work. Punjab Govt. sanctioned Rs 50.00 Lacs during the year 2008-09. Out of which Rs. 47.57 lacs have been utilized. Rs. 42.00 lacs has been earned as revenue and deposited in the treasury during the reporting year.

3. SWC-6 Project for promotion of Micro Irrigation in the State (NABRD-RIDF XIII).

This is new scheme introduced during the year 2007-08. Under this scheme 25% extra subsidy (in addition to 50% subsidy by GOI) is provided on Drip/Micro Sprinkler Irrigation system. During 2008-09, Rs. 669.77 lacs were sanctioned out of which Rs. 659.59 lacs were utilized benefiting 3209 hectares.

4. SWC-7 Scheme for Rain Water Harvesting in the State.

This is new scheme introduced during the year 2008-09 and is being operated in Kandi Areas of the State. For the efficient use of water, Rain Water Harvesting structure, Makkowal type structures and small lift irrigation projects are constructed under this scheme for ground water storage, supplementary irrigation & Erosion control. Rs. 200.00 lacs were sanctioned under this scheme during 2008-09 which was utilized benefiting 1950 hectares.

CENTRALLY SPONSORED SCHEMES

The following Centrally Sponsored schemes have been implemented during the year 2008-09.

1. CS 1 - MACRO MANAGEMENT - WORKS PLAN (Natural Resource Management)

This is Centrally Sponsored scheme on 90:10 Centre State sharing basis. The following three sub schemes were implemented under this program during the year 2008-09:-

a) National Watershed Development Programme for Rainfed Area (NWDPR):

The scheme is implemented in the selected watersheds in kandi areas. During 2008-09 works were executed in Ropar, Mohali, Nawanshaher, Hoshiarpur and Gurdaspur districts. The objective is to enhance agriculture production and bio-mass through erosion control & in-situ moisture conservation by different soil & water conservation activities on watershed basis. State Govt. sanctioned Rs 600.33 lacs under this scheme during the year 2008-09 out of which Rs. 581.30 lacs were utilized benefiting 4785 hectares in Kandi area of the state.

b) Treatment of Catchment Area of Flood Prone River Ghaggar (FPR).

Under this Scheme Watersheds identified by AISLUS, Govt. of India and forming Catchment Area of River Ghaggar in Mohali and Ropar Distt. are treated. The objective of the Scheme is to prevent soil loss from the Catchment to reduce siltation and improvement of land enhancing production and biomass. State Govt. sanctioned Rs 76.33 lacs under this scheme during the year 2008-09 out of which Rs. 70.26 lacs were utilized by treating 589 hectares.

c) Strengthening of State Land Use Board:-

The Board carried out the activities for generating mass awareness for optimum use of land and water resources in the state. State Govt. sanctioned Rs 10.00 lacs under this scheme during the year 2008-09 out of which Rs. 6.79 lacs were utilized. A State level seminar on "Future Strategies for Conservation & Management of National Resources" was organized on 27-2-2009 in which national level & state level experts and officers participated. National Land Resource and Conservation Week was celebrated during 14-20 November 2008. Semi detailed/detailed survey was carried out in 256222 hectares in different districts of the state.

2. CS 2 – PILOT PROJECT FOR RECLAMATION OF RAVENOUS & GULLIED LAND IN PUNJAB UNDER TECHNOLOGY DEVELOPMENT EXTENSION & TRAINING (TDET)

This is 100% GOI scheme. However, 40% share is contributed by beneficiaries on private land works. During the year 2008-09 GOI released Rs. 80.85 lacs under this scheme for ravine reclamation works in Gurdaspur district. The amount couldn't be utilized as the amount was sanctioned on 31.3.2009 bills were submitted but not passed by the treasury.

3. CS-3- CENTRALLY SPONSORED SCHEME FOR MICRO IRRIGATION

This is new centrally sponsored scheme introduced in 2005-06 on 80:20 centre state sharing basis for promotion of Micro Irrigation (Drip & Sprinkler) on Horticulture. Under this scheme 50% subsidy is given to the farmers on the cost of Micro Irrigation System. GOI released Rs. 504.88 Lacs as 80% share during the year 2008-09 in addition to it Rs 202.10 lacs were available as unspent amount of previous year. State Government sanctioned Rs. 106.00 lac as corresponding 20% state share. Total Rs. 812.98 lacs were available during the year 2008-09. Rs. 637.16 lacs were utilized under this scheme by covering 3209 hectares under Drip & Micro Sprinkler Irrigation benefiting 2932 farmers. In addition to it 50% subsidy was provided on 144 water storage tanks in South-Western Districts during the year under report.

OTHER SCHEMES

Rashtrya Krishi Vikas Yojna (RKVY)

This is scheme of Agriculture Department. The objective of the scheme is to enhance agricultural production in rainfed area by efficient use of surface and sub-surface water. This scheme is implemented in Ropar, Mohali, Nawanshaher, Hoshiarpur, Gurdaspur, Patiala, Sangrur, Muktsar, Ferozepur, Bathinda, Faridkot and Ludhiana districts. The main activities under the scheme are Rain Water Harvesting, Perennial Flow, Micro Lift Structure & Community Under Ground Pipeline. During 2008-09 Rs. 485.50 lacs were utilized under this scheme benefiting 5188 hectares.

12th Finance Commission

This is scheme of Agriculture Department. The objective of the scheme is to strengthen the departmental machinery division. During 2008-09, 2 bulldozers are purchased amounting Rs. 113.00 lacs under this scheme.

Integrated Wasteland Development Project (IWDP)

This scheme is implemented on District level funded by Rural Development Department. Under this program, schemes for Soil & Water Conservation works in special problematic areas of different districts are proposed to GOI through the respective Deputy Commissioners & implemented in the fields. Rs. 119.99 lacs were utilized under this scheme benefiting 1750 hectares during 2008-09.

Scheme for Improvement of Wet Land

To control the soil erosion, water harvesting & other land development works are executed in Ropar wet land and Harike wet land of Tarntaran district. Funds are provided by Punjab Science & Technology Department. Rs. 89.26 lacs were utilized by benefiting 713 hectares during 2008-09.

Scheme for Sullage Water for Budha Nalah & Kali Bein

To improve environment and to control the pollution, project for using treated sullage water for irrigation at Budha Nalah & Kali Bein are formulated and implemented. Funds are provided by Punjab Science & Technology Department. Rs. 62.94 lacs were utilized benefiting 50 hectares under

Budha Nalah project and Rs.38.21 lacs were utilized benefiting 143 hectares under Kali Bein project during 2008-09.

National Rural Employment Guarantee Scheme (NREGS)

This Central Government scheme is implemented on district level. During 2008-09, it is being implemented in Nawanshahar & Hoshiarpur district. Rs. 80.30 lacs were utilized under this scheme during 2008-09.

ACHIEVEMENTS DURING 2008-09

During the year under report a sum of Rs. 6743.85 lacs has been spent on covering an area of 25500 hectares under various soil conservation and water management works. Rs. 3293.31 lacs were spent under Non Plan, Rs. 2302.62 lacs were spent under State Plan and Centrally Sponsored Schemes. Rs. 549.42 lacs were spent under other district level schemes i.e. Integrated Waste Land Development Projects (IWDP), Reclamation of Ravenous & Wetland, Rashtriya Savye Rojgar Yojna, Punjab Nirman Programme and NREGS etc. In addition to it Rs. 485.50 lacs were spent under Rashtriya Krishi Vikas Yojna (RKVY) & Rs. 113.00 lac under 12th Finance Commission. 6554 hectares were covered under Watershed Management works benefiting 5755 farmers of 178 villages. 4892 hectares were covered under land leveling and wasteland development works benefiting 10085 farmers of 305 villages and 3209 hectares were covered under Drip Irrigation Scheme benefiting 2932 farmers of 1153 villages. 5481 hect. were covered under Water management works benefiting 2128 farmers of 356 villages and 5364 hectares were covered under water harvesting structures, tapping of perennial flow and small lift irrigation projects benefiting 1407 farmers of 75 villages. Thus, total 25500 hectares area was covered under various Soil Conservation and water management works in 2067 villages benefiting 22307 farmers.

A fleet of 7 bulldozers, 1 excavator-cum-loader, 8 tractors, 1 trencher & 6 laser leveler were engaged in land development works for 7036 hours during the year 2008-09. Under the scheme SWC-5 Machinery Division at Head Quarter, State Govt. released Rs. 50.00 lacs during the year 2008-09 out of which Rs 47.57 lac were utilized. During 2008-09, 2 new bulldozer were purchased from Finance Commission funds. 5109 hectares area was covered under land development works. Rs. 42.00 lacs were earned as revenue and deposited in the treasury during the year under report.

A State level seminar on "Future Strategies for Conservation & Management of National Resources" was organized on 27-2-2009 in which national level & state level experts and officers participated. National Land Resource and Conservation week was celebrated during 14-20 November'2008 in different districts of the State. Soil survey of detailed/semi-detailed nature was conducted in 256222 hectares.

There is Training Institute at Mohali to impart training to farmers and Technical persons upto the level of Soil Conservation Officers. The courses cover all the practical aspects of Soil & Water Conservation works such as land leveling, bench terracing, contour bounding, gully reclamation, water harvesting dams and drainage etc and also give lessons of practice in preparation of plan & estimates etc. 481 officers/officials and 269 farmers were trained under different courses at GOI training institute and departmental institute Mohali.

Benefits

The likely direct and indirect benefits from different Soil & Water Conservation Works are as under:-

- √ Assured/ Life-saving irrigation,
- √ Increase in yield / production by 25%.
- √ Conservation of irrigation water by 25% to 40%.
- √ Increase in Land value by 10%.
- √ Farm land saving of 5%;
- √ Power Saving by 30%;
- √ Rain Water storage of approx. 1350 Ha-m,
- √ Ground water recharge;
- √ Control of salt-accumulation and Erosion Control;
- √ 30% Saving of Labour;
- √ Improvement of physical condition & structure of soil;
- √ Seasonal as well as permanent Water-logged area shall be reclaimed
- √ Ravinous and marshy land along the rivers shall be reclaimed
- √ Productive land having hard impervious pan shall be improved.
- √ Help in diversification to vegetable & horticulture crops.
- √ Training of Technical Officers/ Officials and Progressive farmers;
- √ Extension & Awareness generation among farmers & rural masses;
- √ Promotion & development of innovative field technologies through field demonstrations;
- √ Farm Production system shall be strengthened by assisting small/ marginal farmers.
- √ Livelihood of the landless families shall be improved through various income generating activities.
- √ Socio-economic upliftment of small/ marginal farmers and the landless;
- √ Environment shall be rehabilitated.

NEW INITIATIVES TAKEN DURING 2008-09

In Punjab, the surface water resources are limited and the ground water resource is being depleted. The soil structure has got disturbed and the soil health is getting depleted. The department initiated some remedial steps during 2008-09 to reverse this negative trend. These are briefed as follows:

AWARENESS CAMPAIGNS

Keeping in view the over-exploitation of ground water resources, Awareness Campaigns for farmers regarding water conservation, agronomical measures, diversification to less water requiring crops etc. have been launched in various parts of the state. A awareness camp was organized in which about 93 farmers and 9 officials participated. 481 officers/officials and 269 non-officials members/farmers got training at various soil conservation training centre of GOI and at the state Govt. training Institute, Mohali. 4 Exposure Visits were organized at Pune, Jalgaon, Coimbatore & Bikaner in which 22 officers/officials & 65 farmers participated.

A State level seminar on "Future Strategies for Conservation & Management of National Resources" was organized on 27-2-2009 in which national level & state level experts and officers participated. National Land Resource and Conservation week was celebrated during 14-20 November'2008 in different districts of the State.

LASER LEVELING

In Punjab, there is a huge scope of on-farm water conservation, which can play a major role in arresting the depleting trend of ground water resources. Laser leveling is an innovative technique of land leveling which has been accepted world wide for its numerous benefits. This technology levels large tracts of land on a particular gradient flawlessly. Therefore, the irrigation water can be applied from one end of a large field that reaches the other end by natural flow. This technique not only helps in removing field dividing ridges on large farms but also helps in saving of irrigation water and farm inputs. Also, there is a uniform growth of plants in the field due to even application of irrigation water in every corner.

Keeping in view the above facts, department purchased two more Laser Leveling machines during the year 2007-08 & at present has 6 laser levelers leveling machines. About 800 hectares area has been leveled with these machines during the year under report.

MICRO IRRIGATION

For conservation of irrigation water in the fields, a new scheme for promotion of Micro irrigation (Drip & Sprinklers) on Horticulture crops has been started. There is a provision of 50% subsidy for the farmers on the cost of MI systems. GOI released Rs. 504.88 Lacs as 80% share during the year 2008-09 in addition to it Rs 202.10 lacs were available as unspent amount of previous year. State Government sanctioned Rs. 106.00 lac as corresponding 20% state share. Total Rs. 812.98 lacs were available during the year 2008-09. Rs. 637.16 lacs were utilized under this scheme by covering 3209 hectares under Drip & Micro Sprinkler Irrigation benefiting 2932 farmers. In addition to it 50% subsidy was provided on 144 water storage tanks in South-Western Districts during the year under report.

During 2007-08, the State Govt. sanctioned a new NABARD-RIDF project for promotion of Micro irrigation on the state. Under this scheme 25% subsidy (in addition to 50% subsidy by GOI) is provided on Drip/Micro Sprinkler Irrigation system. Thus, total 75% subsidy is provided on Drip/Micro Sprinkler Irrigation System. During 2008-09, Rs. 669.77 lacs were released out of which Rs. 659.59 lacs were utilized under this scheme benefiting 3209 hectares.

Scheme for Rain Water Harvesting in the State.

This is new scheme introduced during the year 2008-09 and is being operated in Kandi Areas of the State. For the efficient use of water, Rain Water Harvesting structure, Makkowal type structures and small lift irrigation projects are constructed under this scheme for ground water storage, supplementary irrigation & Erosion control. Rs. 200.00 lacs were sanctioned under this scheme during 2008-09 which was utilized benefiting 1950 hectares.

CHAPTER-III

LAND DEVELOPMENT WORKS

Soil and water are two natural resources. Agricultural production depends upon the optimum utilization of these two resources. The top soil, (usually of 7" to 8" thickness) is the principal feeding zone for the growth of most agricultural crops. The loss of this valuable top soil by water and wind results in deterioration in the quality of land which if allowed continuing ultimately results in its going out of cultivation completely. It can be replenished only with the appropriate soil conservation measures and can be improved further by suitable follow up practices.

The Punjab State in its northern region comprising of mountainous area is blessed with a good rainfall, but due to sloppy and undulating topography of land, there is a large scale soil erosion problem. To check this erosion, control measures are required to be taken in order to obtain sustained higher level of production. The area which suffers from soil erosion lies mostly in the district of Hoshiarpur, Gurdaspur, Ropar, Mohali and part of Patiala district. In order to protect this land against erosion and for making it more productive soil conservation works such as gully reclamation and land leveling are being carried out.

Under gully reclamation and watershed management works 6554 hectare were covered benefiting 5755 cultivators of 178 villages and under land development works 4892 hectares were covered benefiting 10085 cultivators of 305 villages.

District-wise progress of the soil erosion control works executed by the department in the Punjab state during 2008-09 has been given in the following tables:-

TABLE 3.1 - District wise progress of gully reclamation and anti erosion watershed management works on agricultural land upto 2008-09 (Area in hectares).

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	0	0	0	0
2	Hoshiarpur	34699	3770	2237	40706
3	Gurdaspur	9402	1372	1050	11824
4	Jalandhar	97	0	0	97
5	Nawanshahar	1299	533	210	2042
6	Kapurthala	191	0	0	191
7	Amritsar	2	0	0	2
8	Tarantaran	0	0	0	0
9	Ludhiana	0	0	0	0
10	Ropar	17805	1692	1529	21026
11	Mohali	762	1957	1528	4247
12	Patiala	4060	0	0	4060
13	Ferozepur	0	0	0	0
14	Sangrur	0	0	0	0
15	Barnala	0	0	0	0
16	Bathinda	0	0	0	0
17	Mukatsar	0	0	0	0
18	Faridkot	0	0	0	0
19	Moga	0	0	0	0
20	Mansa	0	0	0	0
	Total:	68317	9324	6554	84195

Amount spent during 2008-09 was Rs. 686.61 lacs.

TABLE 3.2: District wise progress of Land leveling/Ravine reclamation/ Wasteland Development works done upto 2008-09 (Area in Hectares)

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	6	0	0	6
2	Hoshiarpur	11116	1215	277	12608
3	Gurdaspur	12812	2295	380	15487
4	Jalandhar	5441	80	150	5671
5	Nawanshahar	2024	1926	710	4660
6	Kapurthala	5291	430	280	6001
7	Amritsar	11997	620	211	12828
8	Tarantaran	150	260	320	730
9	Ludhiana	6080	512	0	6592
10	Ropar	7118	26	1567	8711
11	Mohali	459	377	392	1228
12	Patiala	5780	0	0	5780
13	Ferozepur	24691	38	10	24739
14	Sangrur	3945	1063	36	5044
15	Barnala	0	0	0	0
16	Bathinda	7868	0	0	7868
17	Mukatsar	317	512	435	1264
18	Faridkot	12496	200	60	12756
19	Moga	73	0	64	137
20	Mansa	295	0	0	295
	Total:	117959	9554	4892	132405

Amount spent during 2008-09 was Rs. 431.72 lacs.

Table 3.3 : District wise villages covered and cultivators benefited from the land development and anti soil erosion works during 2008-09 (in numbers).

Sr. No.	District	Land Development		Watershed Management	
		Cultivators benefited	Villages covered	Cultivators benefited	Villages covered
1	Fatehgarh Sahib	0	0	0	0
2	Hoshiarpur	120	8	2632	87
3	Gurdaspur	495	37	1180	32
4	Jalandhar	25	20	0	0
5	Nawanshahar	8209	80	215	8
6	Kapurthala	88	32	0	0
7	Amritsar	40	30	0	0
8	Tarantaran	160	15	0	0
9	Ludhiana	0	0	0	0
10	Ropar	440	17	1023	28
11	Mohali	186	11	705	23
12	Patiala	0	0	0	0
13	Ferozepur	25	13	0	0
14	Sangrur	90	4	0	0
15	Barnala	0	0	0	0
16	Bathinda	0	0	0	0
17	Mukatsar	130	19	0	0
18	Faridkot	44	15	0	0
19	Moga	33	4	0	0
20	Mansa	0	0	0	0
	Total:	10085	305	5755	178

CHAPTER-IV

WATER MANAGEMENT WORKS

The prosperity of the State depends upon the development of Agriculture through extension of irrigation facilities. About 25% of irrigation water is lost in conveyance channels through seepage and evaporation. In addition, this seepage created problem of water logging. This loss can be eliminated and water thus saved can be utilized for more irrigation facilities. In order to ensure the coverage of maximum area with available water lining of conveyance channel and installation of underground pipeline together with proper land grading is necessary.

During 2008-09 an area of 14054 hectares was covered under water management works by benefiting 6467 farmers of 1584 villages of the state. During the year under report laying of underground pipe line was carried out to a length of 187.783 kms benefiting an area of 5481 hectares owned by 2128 farmers of 356 villages of the State. 5364 hectares were brought under additional irrigation by constructing/renovating water harvesting structures, tapping of perennial flow and small lift irrigation projects by benefiting 1407 farmers of 75 villages. In addition 3209 hectares was covered under Drip irrigation benefiting 2932 farmers of 1153 villages

District wise progress of water management works is given in the following tables :-

Table 4.1 : District wise progress of underground pipe line laid in the Punjab State upto 2008-09 (Length in meters)

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	224809	11769	2515	239093
2	Hoshiarpur	1798879	7771	2650	1809300
3	Gurdaspur	935065	34910	12770	982745
4	Jalandhar	1592056	20280	13150	1625486
5	Nawanshahar	309732	27978	9500	347210
6	Kapurthala	554445	14740	3730	572915
7	Amritsar	1223021	28380	29420	1280821
8	Tarantaran	45490	62250	17200	124940
9	Ludhiana	1582112	14940	0	1597052
10	Ropar	1072318	2420	250	1074988
11	Mohali	4000	5150	200	9350
12	Patiala	1597576	36021	22607	1656204
13	Ferozepur	1165824	41309	11639	1218772
14	Sangrur	1190304	33269	27544	1251117
15	Barnala	21299	13323	9521	44143
16	Bathinda	611760	1260	0	613020
17	Mukatsar	485888	36840	19969	542697
18	Faridkot	441918	7027	0	448945
19	Moga	227286	18752	5018	251056
20	Mansa	551957	24412	100	576469
	Total:	15635739	442801	187783	16266323

Table 4.2 : District wise progress of Under ground Pipe line according to different sources of funds during 2008-09 (length in meters).

Sr. No.	District	Government	NABARD loan	Cash contribution	Total
1	Fatehgarh Sahib	0	918	1597	2515
2	Hoshiarpur	2650	0	0	2650
3	Gurdaspur	0	1670	11100	12770
4	Jalandhar	0	1780	11370	13150
5	Nawanshahar	0	0	9500	9500
6	Kapurthala	0	0	3730	3730
7	Amritsar	0	3750	25670	29420
8	Tarantaran	0	0	17200	17200
9	Ludhiana	0	0	0	0
10	Ropar	0	0	250	250
11	Mohali	0	0	200	200
12	Patiala	10485	10382	1740	22607
13	Ferozepur	5475	180	5984	11639
14	Sangrur	5665	1330	20549	27544
15	Barnala	0	0	9521	9521
16	Bathinda	0	0	0	0
17	Mukatsar	14719	3000	2250	19969
18	Faridkot	0	0	0	0
19	Moga	0	236	4782	5018
20	Mansa	0	0	100	100
	Total:	38994	23246	125543	187783

Area Benefited during 2008-09 was 5481 hectares.

Table 4.3 : District wise progress of Water Harvesting/Makowal type/Lift Irrigation/Drainage Line Treatment work up to 2008-09 (Area in Hectares).

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	0	0	0	0
2	Hoshiarpur	6060	928	1085	8073
3	Gurdaspur	2560	554	2864	5978
4	Jalandhar	0	0	0	0
5	Nawanshahar	46	105	100	251
6	Kapurthala	0	0	0	0
7	Amritsar	0	0	0	0
8	Tarantaran	0	0	0	0
9	Ludhiana	0	0	0	0
10	Ropar	5784	560	1058	7402
11	Mohali	235	423	257	915
12	Patiala	173	0	0	173
13	Ferozepur	0	0	0	0
14	Sangrur	0	0	0	0
15	Barnala	0	0	0	0
16	Bathinda	0	0	0	0
17	Mukatsar	0	0	0	0
18	Faridkot	0	0	0	0
19	Moga	0	0	0	0
20	Mansa	0	0	0	0
	Total:	14858	2570	5364	22792

Amount spent during 2008-09 was Rs. 508.25 lacs.

Table 4.4 : District wise area covered under water management works in Punjab State up to 2008-09 (Area in hectares)

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	3064	174	31	3269
2	Hoshiarpur	35650	2224	1262	39136
3	Gurdaspur	20094	618	227	20939
4	Jalandhar	31846	311	158	32315
5	Nawanshahar	6688	512	129	7329
6	Kapurthala	12520	324	43	12887
7	Amritsar	24511	691	605	25807
8	Tarantaran	784	722	450	1956
9	Ludhiana	30126	209	0	30335
10	Ropar	24468	271	20	24759
11	Mohali	60	51	16	127
12	Patiala	31741	642	328	32711
13	Ferozepur	40803	788	266	41857
14	Sangrur	27036	1927	1052	30015
15	Barnala	464	210	202	876
16	Bathinda	60342	19	0	60361
17	Mukatsar	10249	1626	593	12468
18	Faridkot	96819	131	0	96950
19	Moga	4406	418	84	4908
20	Mansa	7309	264	15	7588
	Total:	468980	12132	5481	486593

Table 4.5 : District wise area covered under water management works according to sources of funds during 2008-09 (Area in Hectares).

Sr. No.	District	Government	NABARD loan	Cash contribution	Total
1	Fatehgarh Sahib	0	6	25	31
2	Hoshiarpur	1262	0	0	1262
3	Gurdaspur	0	29	198	227
4	Jalandhar	0	23	135	158
5	Nawanshahar	15	0	114	129
6	Kapurthala	0	0	43	43
7	Amritsar	0	25	580	605
8	Tarantaran	0	0	450	450
9	Ludhiana	0	0	0	0
10	Ropar	0	0	20	20
11	Mohali	0	0	16	16
12	Patiala	228	71	29	328
13	Ferozepur	87	7	172	266
14	Sangrur	577	27	448	1052
15	Barnala	0	0	202	202
16	Bathinda	0	0	0	0
17	Mukatsar	465	65	63	593
18	Faridkot	0	0	0	0
19	Moga	0	3	81	84
20	Mansa	0	0	15	15
	Total:	2634	256	2591	5481

Amount spent during 2008-09 was Rs 532.09 lacs.

Table 4.6 : District wise villages covered and cultivators benefited by water management work during 2008-09. (no.s).

Sr. No.	District	Water Management		Water Harvesting/Perennial flow/lift Irrigation	
		Cultivators benefited	Villages covered	Cultivators benefited	Villages covered
1	Fatehgarh Sahib	5	5	0	0
2	Hoshiarpur	815	11	265	6
3	Gurdaspur	44	35	755	52
4	Jalandhar	30	28	0	0
5	Nawanshahar	32	23	35	2
6	Kapurthala	9	9	0	0
7	Amritsar	105	59	0	0
8	Tarantaran	130	42	0	0
9	Ludhiana	0	0	0	0
10	Ropar	7	7	344	14
11	Mohali	5	5	8	1
12	Patiala	163	29	0	0
13	Ferozepur	62	16	0	0
14	Sangrur	283	36	0	0
15	Barnala	39	25	0	0
16	Bathinda	0	0	0	0
17	Mukatsar	370	13	0	0
18	Faridkot	0	0	0	0
19	Moga	27	12	0	0
20	Mansa	2	1	0	0
	Total:	2128	356	1407	75

Table 4.7 : District wise progress under Drip Irrigation Scheme on agriculture land upto 2008-09 (Area In hectares.)

Sr. No.	District	Upto 2006-07	During 2007-08	During 2008-09	Total upto 2008-09
1	Fatehgarh Sahib	23	31	96	150
2	Hoshiarpur	792	865	345	2002
3	Gurdaspur	238	359	221	818
4	Jalandhar	144	265	265	674
5	Nawanshahar	51	84	95	230
6	Kapurthala	48	75	127	250
7	Amritsar	34	192	105	331
8	Tarantaran	89	9	32	130
9	Ludhiana	37	92	150	279
10	Ropar	440	169	35	644
11	Mohali	27	72	88	187
12	Patiala	88	79	284	451
13	Ferozepur	1921	590	597	3108
14	Sangrur	126	167	117	410
15	Barnala	6	68	37	111
16	Bathinda	255	308	168	731
17	Mukatsar	457	286	216	959
18	Faridkot	180	182	122	484
19	Moga	23	118	77	218
20	Mansa	61	176	32	269
	Total:	5040	4187	3209	12436

Table 4.8: District wise Area covered, villages covered and cultivators benefited under drip irrigation scheme during 2008-09.

Sr. No.	District	Area covered (Hectares.)	Cultivators benefited (Nos.)	Villages covered (Nos.)
1	Fatehgarh Sahib	96	19	15
2	Hoshiarpur	345	462	127
3	Gurdaspur	221	169	42
4	Jalandhar	265	115	96
5	Nawanshahar	95	62	42
6	Kapurthala	127	82	70
7	Amritsar	105	58	54
8	Tarantaran	32	41	29
9	Ludhiana	150	74	49
10	Ropar	35	22	22
11	Mohali	88	54	54
12	Patiala	284	69	59
13	Ferozepur	597	988	162
14	Sangrur	117	70	32
15	Barnala	37	29	20
16	Bathinda	168	149	79
17	Mukatsar	216	242	65
18	Faridkot	122	118	52
19	Moga	77	62	45
20	Mansa	32	47	39
	Total:	3209	2932	1153

Amount spent during 2008-09 was Rs. 1291.87 lacs (GOI 530.46 + State 101.82 + NABARD 659.59).

CHAPTER-V

TRAINING OF STAFF

In order to improve the technical skill and efficiency of the field staff, the personnel of Soil and Water Conservation Department, Punjab are sent for training at the various Soil Conservation Training Centres of Government of India and also to the State Government Training Institute, Mohali. The State Government training institute was established in the year 1965 at Hoshiarpur and upgraded to Divisional level in 1975. It was shifted to Mohali during the year 1995-96. The surveyors and Agricultural Sub Inspectors are trained at the State Training Institute at Mohali while the gazetted officers get training at the Govt. of India's training centres. Surveyors and Sub Inspectors are imparted 5½ months training and the course covers all practical aspects of Soil and Water Conservation works such as land leveling, construction of open channels, underground pipe line, contour bunding, bench terracing, gully reclamation, water harvesting dams, drainage etc. and are also given practice in the preparation of plan and estimates.

During the year 2008-09, total 481 officers/officials and 269 farmers were trained under different courses at GOI training institutes and departmental institute, Mohali. 1 officers got 5½ months training at GOI training centre, Dehradun. 8 officers and 71 farmers got training on concept of participatory watershed management regarding NWDPRRA & IWDP scheme. 49 officers and 15 non-official members got training under refresher course regarding Engineering Survey Design Planning and Estimates of different Soil & Water Conservation Works. 366 officers/officials and 25 non official members got training regarding Micro Irrigation Scheme. Awareness camp on Micro Irrigation was organized in which 9 officer/officials and 93 farmers were participated. 26 officials got training under refresher course regarding Civil Services Rules (pension, gratuity and leave etc).

4 Exposure visits were organized regarding Micro Irrigation system at Pune, Jalgaon, Coimbatore & Bikaner in which 22 officers/officials and 65 farmers participated.

CHAPTER-VI

SOIL SURVEY

Different kinds of soil according to their physical and chemical properties need different levels of soil and water management practices and different level of inputs for optimum agriculture production. Soil Survey are thus crucial to suggest proper and optimum use of land according to its capability and also for formulation of suitable cropping pattern, proper soil and water management, land development, land reclamation and other management practices.

The purpose of the scheme is to carry out land use survey in the State. The Soil Survey is carried out, problems are investigated and solutions are suggested. The fertility status of the soil is evaluated so that every piece of land is put to the use for which it is best suited in order to get maximum production. In this context, the emphasis is laid on the detailed soil survey of problematic and command area. Soil survey is carried out using village cadastral maps, Toposheets, Aerial Photographs and Land set Imagery as base map to delineate soil boundaries of uniform groups having the same characteristics for similar management practices to work efficiently and profitably.

During the year 2008-09, an area of 256222 hectares was surveyed for different soil conservation works. For preparation & planning of different schemes of department, semi detailed soil survey was done in 1200 hectares in Gurdaspur District, 216940 hectares in Moga District, 32767 hectares in Hoshiarpur District, 1000 hectares in Ropar District, 800 hectares in Mohali district and 3490 hectares in Nawanshaher District.

25 hectares detailed soil survey was carried out in village Shero Bhaga, District Amritsar.

CHAPTER-VII

FINANCES OF DEPARTMENT

Soil Conservation and Water Management works in Kandi area are mostly funded out of the State Budget and in other areas, the Institutional Finances are arranged and utilized for works. Funds under non-plan schemes are sanctioned for salary & staff contingent needs and Funds under State plan & centrally sponsored schemes are sanctioned for works. In addition to it some funds are raised and utilized from other agencies like District Rural Development Agencies, Science and technology department and DC funds etc.

Comparative figures of expenditure incurred in respect of Non-plan, State plan, centrally sponsored schemes, institutional finance and other district level schemes for the last three years are as under:-

		(Rs.)		
S.No.	Item	2006-07	2007-08	2008-09
A.	Non plan	333336003	345123753	329330695
B.	Plan			
	i) State plan	74181301	78247649	117652950
	ii) Centrally Sponsored	109643710	122030608	112609006
	Total plan (I+II).	183825011	200278257	230261956
C.	Total (A+B)	517161014	545402010	559592651
D.	Institutional Finance	51425000	-	-
E.	Cash Contribution.	166513000	-	-
F.	Rural Development Board's /Central Ground Water Board/Science and Technology Department and DRDA/DC funds	39140000	76755000	54942000
G.	Rashtrya Krishi Vikas Yojna (RKVY)	-	76950000	48550000
H.	12 th Finance Commission	-	27000000	11300000
	Grand Total(C+D+E+F+G+H)	774239014	726107010	674384651