

## **ADMINISTRATIVE SET-UP OF THE DEPARTMENT**

At district level the department of agriculture functions under the guidance of Chief Agricultural Officer (CAO). At Ludhiana, the office of CAO is situated on Ludhiana-Ferozpur Road just near Aggar-Nagar Ludhiana. Agricultural Development Schemes are implemented in the district through various wings of the Department of Agriculture. The department also keeps a check on the various inputs supply agencies to ensure timely supply of quality inputs to the farmers of the district. To provide extension services CAO is presently assisted by three Agriculture Officer at district level and only seven Block Agriculture Officers in 12 blocks with 25 Agriculture Development Officers at Block / Focal Point Levels. Further assistance is provided by 5 Agriculture Sub Inspectors / Village Development Officer along with an Assistant Statistician and one Senior Assistant. The activities and services provided by various wings of the department are described below:

### **SOIL TESTING LABS**

The Department has four Soil Testing Labs in the district. The labs help farmers in planning their production strategies by testing their soil samples for major and micro-nutrients. The main objective of this wing is to insist the farmers to adopt the concept of need based supplementation of essential plant nutrients necessary for optimum growth and development of the field crops.

### **INFORMATION OF SOIL TESTING LABORATORIES**

<b>S. No.</b>	<b>Location of Lab</b>	<b>Block</b>	<b>Stationary/ Mobile</b>	<b>Testing facility</b>	<b>Working under</b>	<b>Status</b>
1.	Jagraon	Jagraon	Stationery	NPK	CAO	working
2.	Machiwara	Machiwara	Stationery	NPK	CAO	No Staff
3.	Samrala	Samrala	Stationery	NPK	CAO	No Staff
4	Khanna	Khanna	Stationery	NPK and Micro- nutrients	CAO	working

### **QUALITY CONTROL SET UP**

The department has been assigned an important role of quality control of agriculture inputs. All the seed/pesticide/ fertilizer dealers are licensed by CAO to sell these inputs under various Provisions of the Seed Act, Insecticides Act, Fertilizer Control Order etc. A flying squad at the district level has been formed which keeps a vigil on the sale of spurious/ misbranded inputs. At the block level, all the Agriculture Development Officers in their areas of jurisdiction ensure

the quality of various inputs like pesticides, insecticides, fertilizers etc. The samples of inputs are taken from the dealers regularly. The dealers whose samples are sub standard, are punished as per the provisions of suitable legislation.

One each seed, fertilizer, and insecticide testing laboratory is functioning in the district. Main role of these laboratories is to test various samples as collected from the field. Misbranded samples are reported to the sending authority who takes necessary action against the guilty under various provisions of law.

### **AGRICULTURE ENGINEERING (BORING) SECTION**

Water is a critical input in agriculture. Without water agriculture is not possible. Ludhiana district falls in central part of Punjab. In Ludhiana district only 3% (9000 ha) of area is irrigated by canal water and rest 97% (2,97,000 ha) of area is irrigated by tube wells. Because of monoculture of Wheat-Paddy crop rotation, overexploitation & in-discriminate pumping of ground water by large number of tube wells in Ludhiana district, has resulted in ground water withdrawals more than the natural recharge that takes place. Out of total 12 blocks of the district, 11 blocks are in dark zone and only one block i.e. *Doraha* is in critical zone. Net replenish able ground water availability in the district have been assessed as 2341.16 mcm. Gross ground water draft for all uses in the district is 3380.89 mcm, thus leaving a shortfall (Overdraft) of 1039.73 mcm. The extent of ground water development in Ludhiana district has been assessed to be 144%. This means water is being extracted at much faster rate than its natural replenishment rate. The state of the world report, 1998 by the World Watch Institute in USA estimates that the gap between water use and sustainable yield of the aquifer is so high that the aquifer under Punjab could be depleted by the year 2025. All these factors necessitate the need for sustainable ground water supply & requires additional steps at all levels to augment the ground water by means of artificial recharge. Artificial recharge of under ground water is a promising strategy to arrest the declining water table and to restore supplies from aquifers depleted due to excessive ground water development, which will result in saving of energy for lifting of water (1m of rise in water level saves about 0.40 KWH of electricity). Significant water table decline has been observed in north western and south western parts of Ludhiana district. The depth to water level in the area ranges between 9- 30 m bgl. During the monsoon period depth to water level ranges between 9.24 to 25.48 m bgl and in post monsoon it ranges between 5.09 – 33.62 m bgl. The term water trend indicates the water level showing decline ranges from 0.11 m/year - 1.34 m/year (last 10 years). The declining water table trend if not checked, will fall beyond the lifting capacity of the pumps, affecting agricultural production of the economy. Ground water recharge & ground water conservation may be done in these areas to check water level decline.

#### **Rainwater Harvesting and Artificial Recharge to Groundwater:**

Rain is the first form of water that we know in the hydrological cycle, hence it is a primary source of water for us. Rivers, lakes and groundwater are all secondary sources of water. In present times, we depend mainly on such secondary sources of water. In the process, it is

forgotten that rain is the ultimate source that feeds all these secondary sources and we remain ignorant of its value.

The concept of rainwater harvesting lies in tapping the rainwater where it falls. A major portion of rainwater that falls on earth's surface, run-off from streams to rivers and finally to the sea. An average of 8% of the total rainfall recharges the ground water aquifers. Therefore, most of the rainfall goes waste in the form of surface run-off. Rainwater harvesting and artificial recharge are processes by which excess surface runoff water or rainwater collected from rooftops is directed into the ground by using recharge wells. It refers to the movement of water through man-made systems from the surface of the earth to underground water bearing strata where it may be used for future use. Artificial recharge is a way to store water underground in times of water surplus (Monsoon months) to meet demand in times of shortage.

The normal rainfall of district is 680 mm which is unevenly distributed over the area in 34 days. According to CGWB recommendations, the north western and south western parts of the district where water level decline exists, artificial recharge structures may help in arresting more than 5 cm/year of water level decline in an area. Generally Recharge Trench with injection well structure is the suitable for artificial recharge.

**Recharge Well:** A recharge well is one, which admits water from the surface to aquifer. The recharging well may be (a) abandoned open wells/tube wells or (b) Specially designed wells having vertical or horizontal intake slotted pipes.

A well assembly of 305/203 mm dia. combination using about 80 m – 90 m housing length having slot size of 1.19 mm and shrouded with pea gravel of 3-5mm size, would be ideal for the district. The 'V' wired galvanized Johnson screen having 1.00 mm slot width may also be used against granular zones, as it has more open space for entrance of water. The shallow tube wells up to 40 m depth should have 203 mm single dia. pipe with a suitable screen length. In Ludhiana district, Reverse Rotary Rig can carry out the drilling with a suitable length. The recharge well shall be developed with an air compressor for about 8 hours. Recharge to ground water can generally be done through recharge structures (civil structures such as collection / de-siltation chamber, Filtration chamber, road gully etc.) made up of bricks, cement-sand mortar and concrete. These structures are site specific. Therefore changes are expected and modifications in the design to be carried out as per actual site conditions.

**One Recharge well can easily recharge up to 2500-3500 m<sup>3</sup> of rainwater to groundwater per year.**

**It is proposed to install 100 Recharge Wells in Ludhiana District at appropriate locations in the next 5 years with financial support from Govt.**

Average Cost of one Recharge well including civil work (site specific)	:	<b>Rs. 3 Lac</b>
Proposed installation of Recharge wells per year in the distt.	:	20
Total Number of Recharge wells to be installed in Five years in LDH	:	100
<b>Total amount required for 100 Recharge wells @ 3.00 Lac per well</b>	:	<b>Rs. 300 Lac.</b>

**Strengthening of Tube well/ Boring Infrastructure:**

- (a) Purchase of one no. reverse rotary drilling rig (8" dia Drilling Rods) : 75 Lac.  
 (b) Purchase of one no. air compressor 400 psi/ 800 cfm : 35 Lac.  
 (c) Purchase of Gen. Set & Portable Welding set (1 each) : 15 Lac.  
 (d) Purchase of one no. Tractor ( 58 H.P) : 5.5 Lac.  
 (e) Purchase of one no. Truck : 12 Lac  
**Total amount required for strengthening of infrastructure (Rs.) : 142.50 Lac.**

**Staff to be employed on contractual basis for implementation of the scheme:**

To effectively implement the Artificial Recharge scheme in the Ludhiana district, suitable & experienced, skilled and semi-skilled staff would be employed on contractual basis in addition to existing staff available under this office. Installation of Recharge Wells in Ludhiana District would be carried out by the skilled & semi skilled staff employed on contractual basis whose monthly fixed salary would be 1.6 Lac/pm.

**Honorarium / Compensation for Contractual workers (Skilled & Semi-Skilled) for 5 years : Rs. 96 Lac.**

**PROJECTED DEMAND FOR FUNDS FOR THE SCHEME (Year- wise)**

<b>Component</b>	<b>1<sup>st</sup> year</b>	<b>2<sup>nd</sup> year</b>	<b>3<sup>rd</sup> year</b>	<b>4<sup>th</sup> year</b>	<b>5<sup>th</sup> year</b>
Installation of Recharge Wells	60 Lac	60 Lac	60 Lac	60 Lac	60 Lac
Strengthening of Tube well / Boring Infrastructure	75 Lac	40.5 Lac	12 Lac	15 Lac	---
Honorarium / Compensation for Contractual Staff	19.20 Lac	19.20 Lac	19.20 Lac	19.20 Lac	19.20 Lac
<b>Total ( Rs.)</b>	<b>154.20 Lac</b>	<b>119.70 Lac</b>	<b>91.20 Lac</b>	<b>94.20 Lac</b>	<b>79.20 Lac</b>

**TOTAL FOR FIVE YEARS Rs. 538.5 Lac.**