

# WATER AWARENESS PROGRAM (WAP)

## FOR FARMERS (Moga, Punjab)



Understand  
UNDESRAND

Conserve  
CONSERVE

Protect  
PROTECT

Nestlé India

# OBJECTIVE OF THIS PROGRAM



This program has been specially designed by Nestlé to create awareness amongst farmers about:

- The importance of water
- The problems likely to affect agriculture in coming years from the 'over exploitation' of groundwater resulting in severe depletion of the water table
- The steps you, as a farmer, can take to meet the challenges – e.g. Water conservation methods, etc.

# PUNJAB: USHERER OF THE 'GREEN REVOLUTION'



- Punjab has an area of 50,362 sq kms and 83.13% area of total geographical area of Punjab is under agriculture.
- Punjab (Land of the five rivers) is one of the most fertile regions on earth
- Covering only 1.54 % of the country's total geographical area, Punjab produces a large chunk of India's food and is called the "Granary of India" or "India's bread-basket"

# PUNJAB: NATION'S TOP AGRICULTURE PRODUCER

- Punjab tops in Agriculture yields in the country in Rice and Wheat per acre in the country:

WHEAT: 1745 kgs per acre = 17.45 quintal per acre

RICE: 1622 Kgs per acre = 16.22 quintal per acre



# AGRICULTURE SUCCESS: THE KEY WINNING COMBINATION

The hardworking  
farmers



The alluvial soils of  
Punjab are one of  
the most fertile  
soils in the world



Access to water. 92% of agriculture  
irrigation is sourced from groundwater  
through tube wells and bores



Scientific research by  
Punjab Agricultural  
University and the  
introduction of new high  
yielding varieties of crops

# SOME MORE REASONS FOR THE AGRICULTURE SUCCESS



Braving extreme temperatures in Winters and Summers, the resilient Punjab farmer trudges along. With intensive cropping he optimizes the yields from his agricultural fields

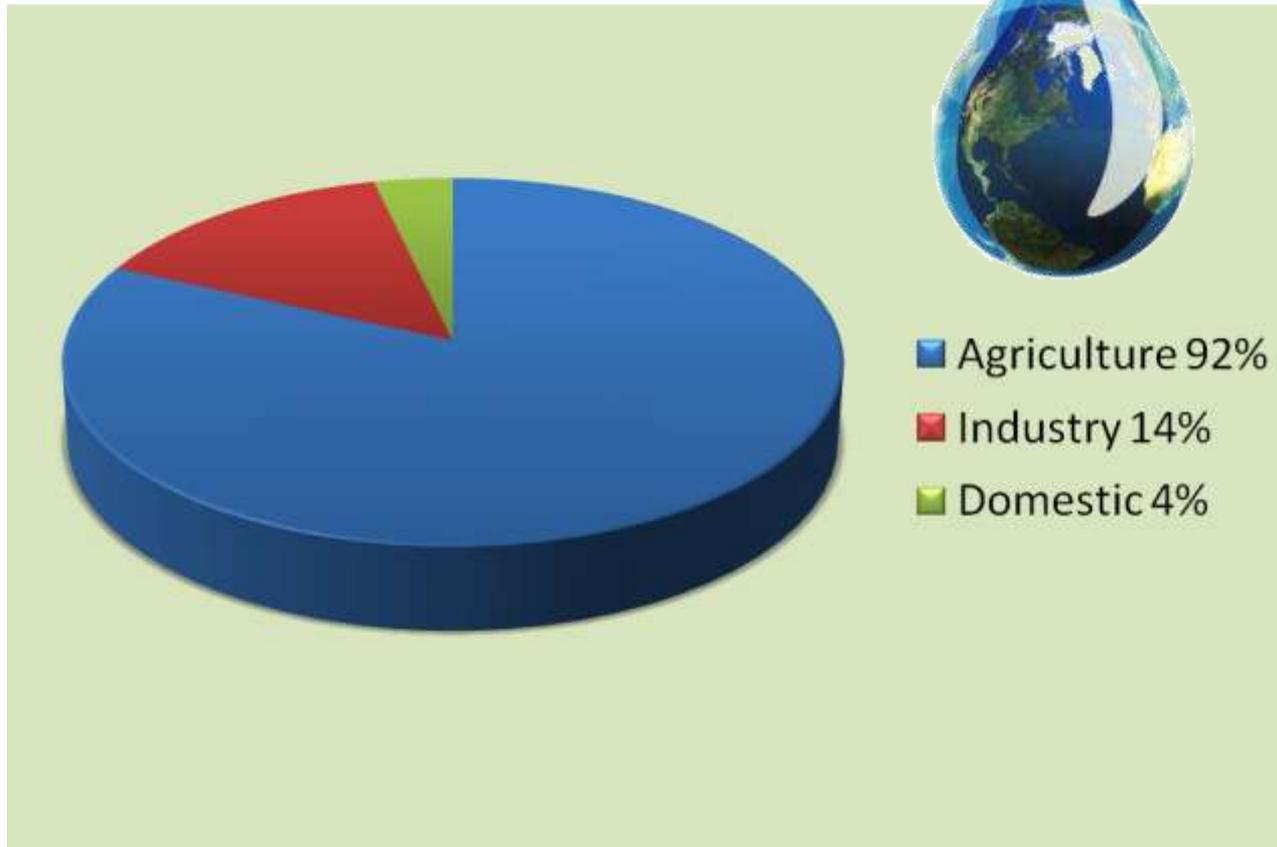


Mechanization of agricultural farm equipment and Government supports in form of subsidies, etc

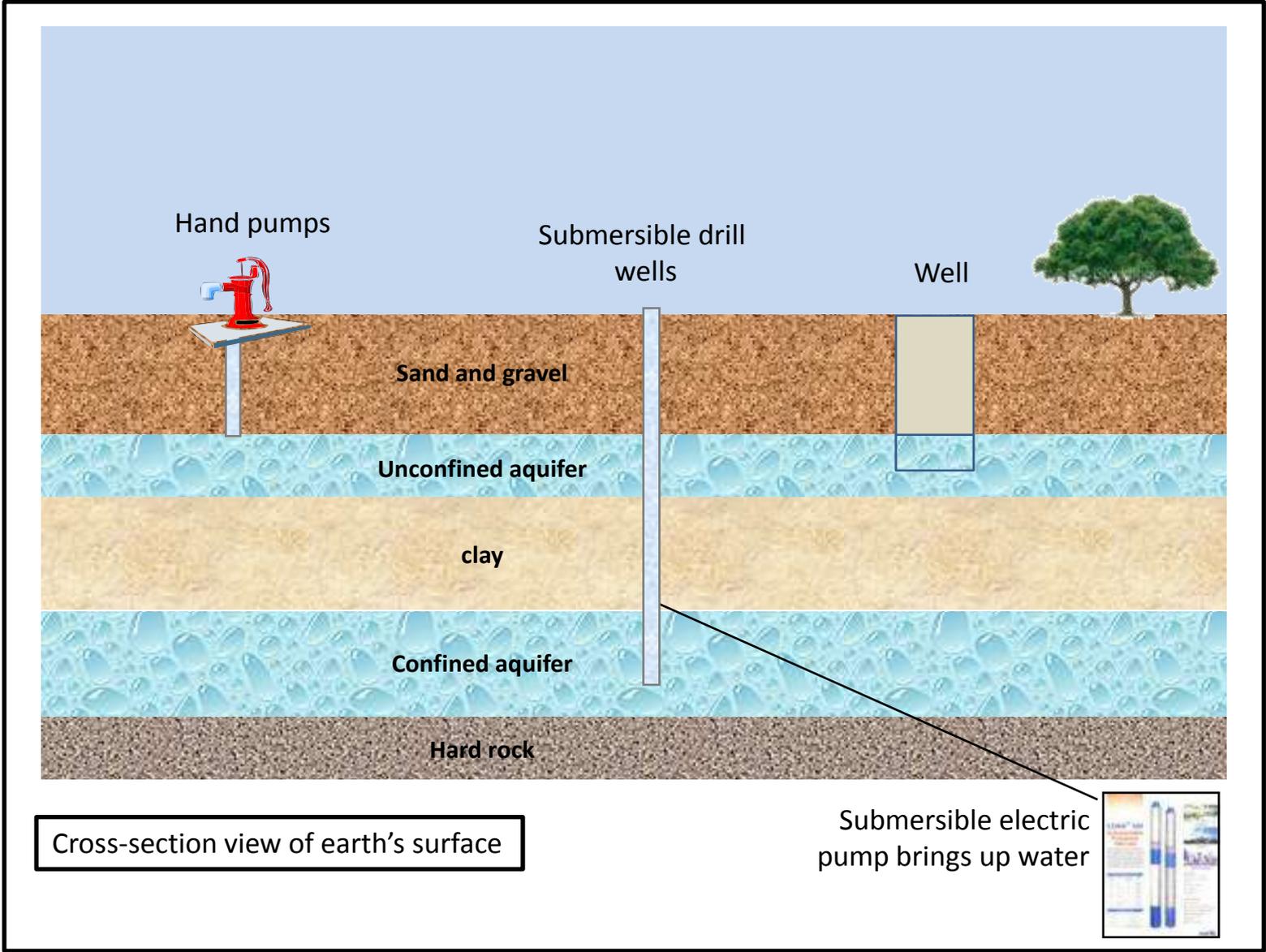


The farmer's family lends a big helping hand on the farm and in the household

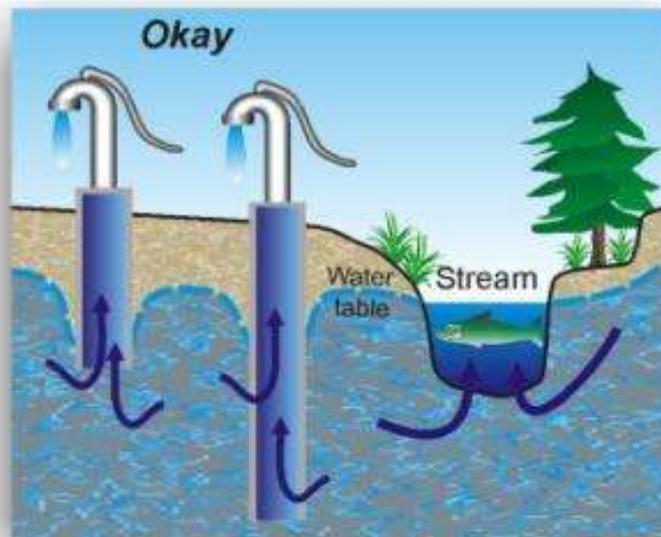
# WATER CONSUMERS: AGRICULTURE, A MAJOR USER



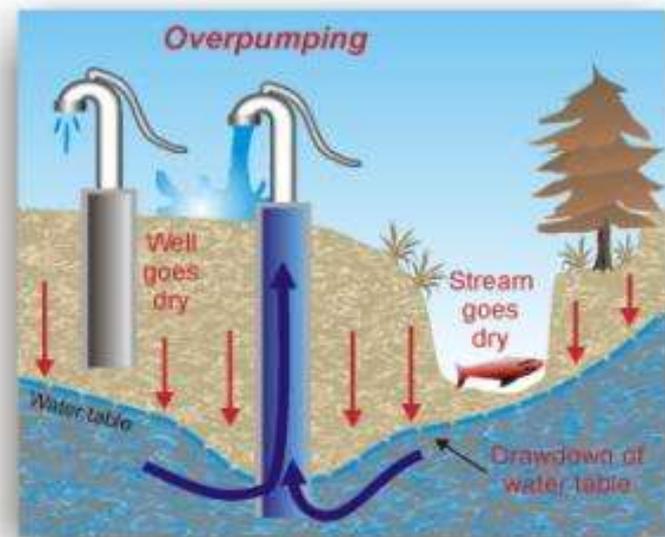
# UNDERSTANDING GROUNDWATER



# GROUNDWATER DEPLETION: HOW IT HAPPENS



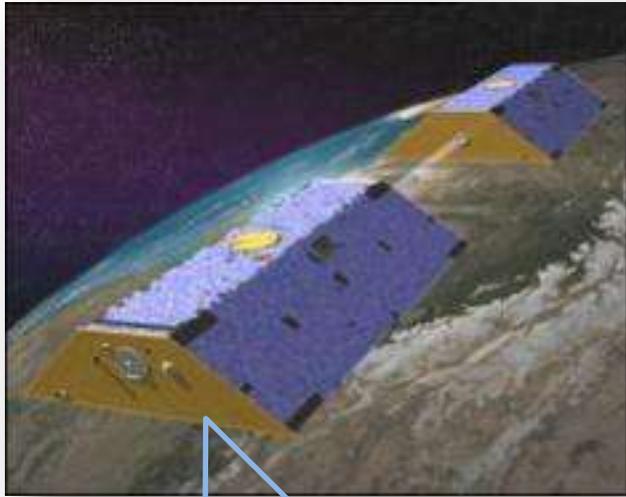
If 'extraction' is matched by 'replenishment' the groundwater levels are recharged and maintained.



However, when users 'over exploit' groundwater, then it leads to water table depletion as the ground waters cannot be replenished at same rate as extraction.

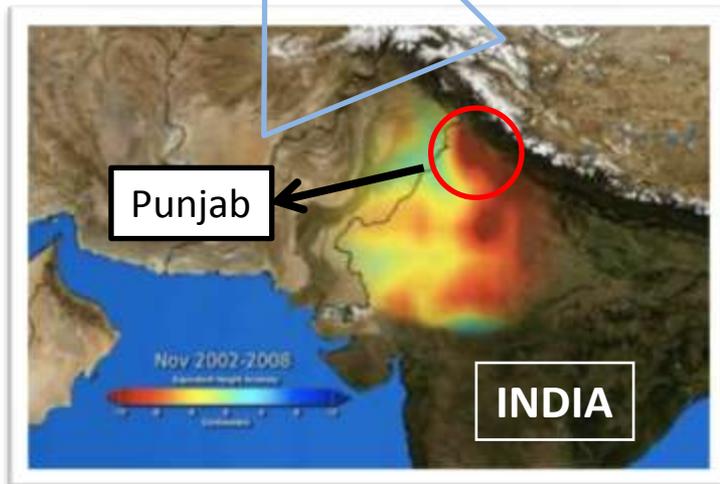
That is the reason farmers have to dig deeper wells every 2-3 years to get access to water

# TRACKING GROUNDWATERS OF INDIA



GRACE satellites

- A pair of satellites , part of a joint U.S.-German mission known as GRACE (Gravity Recovery and Climate Experiment)
- The team analyzed six years (2002-2008) of monthly GRACE gravity data for northern India.
- They found that in north India groundwater levels have been declining by an average of one meter every three years (one foot per year)



# GROUNDWATER IN PUNJAB: CRITICAL SITUATION



- In Punjab, the number of tube wells have increased from 1.2 lakh in 1970 to 13 lakh in 2010
- In June 2010, Punjab Government has imposed a ban on digging tube-wells or any ground water extraction unit in 300 villages falling in 3 Districts of Punjab – Ludhiana, Sangrur and Moga.
- In Moga District, these include the blocks of Moga – I and Moga – II. These blocks are declared as 'over exploited areas'.

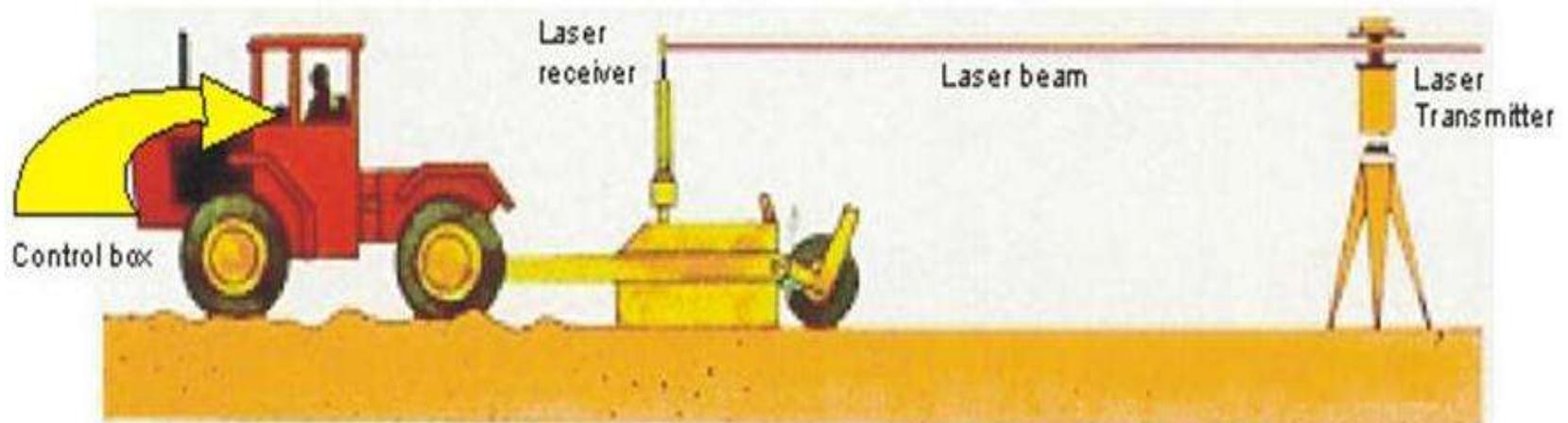
# IWMI report : findings and suggestions



- International Water Management Institute in their report state that groundwater levels in Punjab are decreasing quickly due to over pumping for irrigation in agriculture
- Paddy cultivation is the main contributor to excessive groundwater usage
- Water usage for agriculture can be reduced through changed cropping pattern: less fields under rice, more fields under fodder, higher dairy production, delayed transplanting, laser land leveling, increased bund heights, intermittent irrigation, system of rice intensification.

# LASER LAND LEVELING

- **Laser land leveling** is the process of smoothing the land surface from its average elevation, using large horsepower tractors and soil movers, equipped with laser guided instrumentation
- Benefits
  - Increases cultivable area from 3 - 5%.
  - Saves irrigation water and total water use by at least 30%
  - Increases water application efficiency by up to 50%
  - Reduces weed infestation due to uniform crop stand and growth
  - Increases crop yield
  - once leveled the land does not require any major work for about 8 years
- The resulting financial benefits from reduced costs for water, fertilizer, energy, weeding, man hours invested etc. and increased crop yield become evident within the first year itself for certain crops.



# 'PUCCA' WATER CHANNELS AND BUND HEIGHT



- **'Pucca' water channels** – These ensure that water is not lost in the process of transporting it from the tube well to the fields.



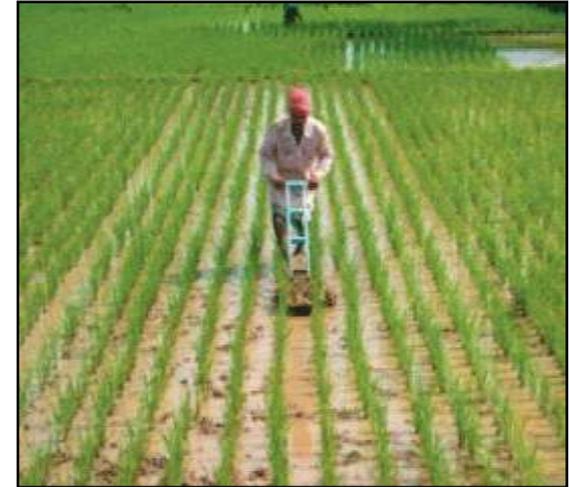
- **Raising of bund heights around rice fields** - maintaining a bund height of about 22 cm around the rice fields helps to capture all of the monsoonal rains in the rice fields better (above 95% capture).

# DELAYED TRANSPLANTING OF PADDY



- **Transplanting of paddy** in the hot months of May to June leads to high evaporation losses, contributing to excessive groundwater pumping.
- “Punjab Preservation of Sub-Soil Water Act-2009” enacted by the Government of Punjab, mandates that all the farmers in the State must transplant paddy only after June 10.
- **Benefits**
  - Reduced extraction of groundwater
  - Reduced electric power use

# SRI - System of Rice Intensification



## Key Features of SRI:

- SRI is a whole package of improved rice cultivation methods
- Detailed information available from PAU and Nestle
- Transplanting of 8-12 days old rice seedlings into fields
- Repeating irrigations only after field is dry for 3-4 days
- Manual weeding

## Main benefits of SRI versus conventional method

- Requires around 40% less irrigations
- Yield increase by 25-40%
- Lower quantity of seed required (75%)

# MICRO-IRRIGATION



Micro Sprinklers

- **Micro-irrigation** applies water and other inputs most efficiently and directly near the root zones of the plants, uniformly and frequently. Thus, the irrigated area can be increased with the same amount of water available
- **Benefits**
  - Increases water productivity as area under irrigation is doubled with the existing water resource
  - Increases crop yield of 30 to 200%
  - Reduction in fertiliser usage, labour, energy and other operational cost

# CROP DIVERSIFICATION



- Water foot print of Paddy is highest when compared to wheat and milk.
- Farmers should explore other less water intensive agriculture alternatives like Dairy farming.
- Land can be used to grow fodder.