

# Role Of Precision Agriculture In Soil Water Conservation & Management

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With an increasing trend of population worldwide especially in India which is already under huge water stress zone as water sources are depleting rapidly because of the erratic consumption pattern in the country. The world is now realizing that soon there will be acute shortage of water and it's the most crucial resource at this juncture.

## CHALLENGES TO ADDRESS

### a) Judicial Use of Fresh Water:

Earth has only 3% of fresh water available to mankind out of which 0.5% is available for consumption and rest is in form of glaciers or in deep soil where its extraction is not viable.

Presently, India has 4% of the 0.5% fresh water available on earth while we lead the race in global population.

b) **Food Security:** With faster depletion rate of ground water and upwards trend of population growth, the biggest challenge is food security for the upcoming decades. To increase crop growth, more area has to be brought under cultivation, and the arrangement of irrigation water has to be done parallelly.



c) **Climate Change à Global Warming:** With increased industrialization and simultaneous increase in population density of urban areas we need to fight with this challenge of climate change.

With faster depletion of water sources and more demand of water towards drinking and industries, using fresh ground water for horticulture is getting critical and is non-feasible, but in order to build a better planet for the future generations, green areas like Parks/Gardens/Road medians/Tree plantation needed to be developed and irrigated.

## NEED OF AUTOMATION IN AGRICULTURE

To meet above challenges, we need Automation in Agriculture especially in Irrigation domain by adopting Automatic Micro Irrigation Systems which will benefit the farmers and furthermore resolve the depletion of ground water.

- **Precise & Fertigation irrigation** → Healthier Crop → Better Yield & Quality
- **Convenience of Night Irrigation** → Resulting in lower Evaporation Rate → Lesser Water Requirement
- **Irrigation of Pulses** → Reduces seepage losses/ Runoff → Effective use of water
- **Less Pumping Hours as compared to Flood Irrigation** → Lower Water Bills → Lower Energy → Lower Electricity Bills
- **No Labour requirement** → Lowering operational cost → Lowering Cultivation Cost.
- **Retention of Rural Youth in Agriculture:** In last decade we found lot of migration by farmers children to other countries as they find Agriculture more cumbersome and non-lucrative. By making affordable and effective automation gadgets,



this can change mindset of newer generation of farmers to retain them in agriculture.

#### HESITATION IN ADOPTION OF AUTOMATION IN INDIA

- **Illiteracy rate of farmers:** Earlier farmers education level was hindrance in adoption of automation technology.
- **Erratic Electricity at Farms:** The electronic devices used in irrigation especially irrigation controllers were not designed to address the erratic supply of electricity at farms due to which programmed irrigation would get skipped.

Even progressive farmers those who spent money on these gadgets were not happy with the performance of such automation.

- **Hitech Gadgets:** The features of gadgets were so advanced that the farmers couldn't navigate through the system operations.
- **After Sales Service:** Since few systems were sold Pan India, after sales service was the biggest issue faced by the farmers who adopted these technologies.

Since the devices were imported, the availability of spares parts was an issue.

- **High Preliminary Cost:** As the devices were imported and designed for developed nations and their large farms, affordability was a big reason for hesitation in adoption of automation systems in agricultures.

#### INNOVATIONS NEEDED & CREATED BY DOMESTIC PLAYERS FOR AUTOMATION IN AGRICULTURE

- **Low Cost Automation System:** Considering the average farmer holding of 1 Hectare in India, Low Cost Automation System are designed and manufactured in India by prominent players considering the affordability of these farmers.

Earlier main components like Irrigation Cum Fertilizer Controller, Electric Solenoid Valves, Rain Sensor, Soil Moisture Sensor, Flow Detection Sensor & Water Meter with Reed Switch were imported but are now manufactured in India.

- Addressing Erratic Electric issues by using solar energy so that performance of the system is not affected.

- Gadgets features are customized according to the basic needs of the user so that adaptability of Automation remains comfortable amongst farmers.
- Programming Steps in Vernacular languages for making gadgets user friendly.
- Facilitating training programs for ITI Electrical Technicians/Dealers for prompt services.

#### GOVERNMENT INITIATIVES FOR AUTOMATION PROMOTION IN AGRICULTURE

- Central/State Govt. have given thrust for adoption of Automation in agriculture by approving the Automation Cost for Rs.40000 per Hectare with assistance of 50% as subsidy to interested farmers.
- As per guidelines, each state has the target to cover 5% area through Micro Irrigation in a financial year

