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International Commission on Irrigation and Drainage (ICID)



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Climate Smart Precision Farming

2nd Indo Global Irrigation Summit

24-25 June 2026, New Delhi India



CLIMATE SMART PRECISION FARMING



“Leave this world better
than you found it.”

- Bhavarlal Jain





Corporate philosophy

Mission	: Leave this world better than you found it
Vision	: Establish leadership in whatever we do at home & abroad
Credo	: Serve & strive through strain & stress; Do our noblest, that's success
Goal	: Achieve continued growth through sustained innovation for total customer satisfaction and fair return to all other stakeholders. Meet this objective by producing quality products at optimum cost and marketing them at reasonable prices
Guiding principle	: Toil and sweat to manage our resources (men, material and money) in an integrated, efficient, economic & sustained manner. Earn profit, keeping in view commitment to society and environment
Quality perspective	: Make quality a way of life
Work culture	: Experience: 'Work is life, life is work'

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Touching lives in more than one way



**DRIP
IRRIGATION**



**SPRINKLER
IRRIGATION**



**RESOURCE
TO ROOT**



**DRINKING
WATER SOLUTION**



**FOOD
PROCESSING**



**PROTECTED
CULTIVATION**



**PVC PIPES &
FITTINGS**



**PLASTIC
PRODUCTS**



**PLUMBING
SYSTEMS**



**RENEWABLE
ENERGY**



**TISSUE
CULTURE**



**PE PIPE &
FITTINGS**

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Impact of Climate Change on Agriculture

- ▷ Agriculture is one of the largest and most important sectors in the Indian economy.
- ▷ Higher or lower temperatures and unanticipated rainfall across the country resulting in reduced crop yields and overall food production.
- ▷ Increased frequency and intensity of extreme weather events such as droughts, floods, cyclones, hail, frost etc.
- ▷ Deterioration of water quality due to sea water intrusion, transport of salts etc.



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Climate Smart Precision Farming

- ▷ In India, agricultural output is often determined by the unpredictability of nature. Therefore, agriculture sector in India is highly vulnerable to climate change.
- ▷ The increasing temperature and changing pattern of rains reduce crop yields.
- ▷ **Climate Smart Precision Farming Solutions** help reducing the risk to crops due to extreme climatic events and make agriculture more resilient and profitable.



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Jain Climate Smart Precision Farming Solution

Jain Climate Smart Precision Farming (JCSPF) is an integrated approach which provides most efficient irrigation strategy.

JCSPF aligns with the UN's Sustainable Development Goals (SDGs).

SDGs have also been adopted by G 20 countries. They have to contribute to achieve these SDGs by 2030

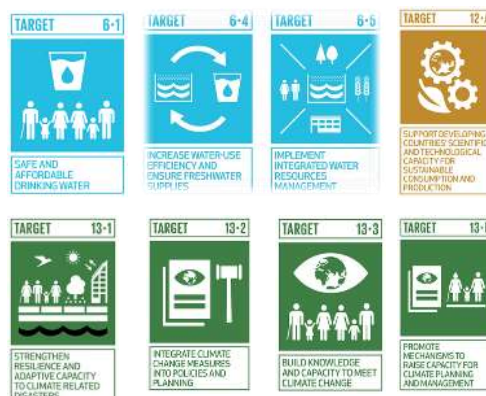


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Goals of Jain Climate Smart Precision Farming

- ▷ To provide most efficient irrigation strategy to mitigate the impacts of climate change and achieve food security and helps to guide actions to transform agri-food systems towards green and climate resilient practices.
- ▷ Supporting smallholding farmers and large agricultural enterprises.
- ▷ Improving farming activities to achieve higher crop yields.
- ▷ Reducing the impact agriculture makes on the environment.
- ▷ Ensuring the preservation of soil fertility and biodiversity.
- ▷ To allow farmers to retrieve valuable insights from vegetation indices, weather analysis, and field historical data for smart farm management.



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Solutions...

I) Climate Control/Crop Care/ Protected Farming

- 1) Protected Cultivation/Environmental Control Farming Systems & Solutions
 - a) Glass-House/Greenhouse/ Farming Systems
 - b) Poly House /Net House & Tunnel Solution Systems
- 2) Trellis & Overhead Cable Systems
- 3) Crop Cover & Protection Systems.
- 4) Crop Cooling & Frost Protection Systems



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Solutions...

(II) Future Farming

- 1) Soilless Farming Systems and Solutions
- 2) Hydroponic Farming Systems and Solutions
- 3) Aeroponic Farming Systems and Solutions
- 4) Vertical Farming Systems and Solutions
- 5) Urban/Peri Urban Farming Systems and Solutions
- 6) Indoor Horticulture systems
- 7) Speed Breeding



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Solutions...

(III) Precision Farming

- ▷ Precision Micro Irrigation Systems to Drought Mitigation
- ▷ Decision Support Systems (DSS) based on crop water requirements.
- ▷ Precision Fertiligation and Nutrition Management Systems for crop yield enhancement
- ▷ Agro-Voltaic Precision Farming Systems for crop yield enhancement



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Less Rainfall/ Droughts	Crop loss, decrease in yield	● Use of Precision Micro Irrigation Solution Systems with fully automated decision support systems with soil moisture sensor to be operated to control the operation scheduling of irrigation system ● Use of precision fertilizer and nutritional management systems.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Prolonged dry spells (rain breaks) during monsoon	Decrease in crop yield or entire crop loss due to non-availability of soil moisture at critical periods of growth.	• Portable/Shiftable Irrigation Solution systems for survival irrigation.
		• Micro Irrigation systems solutions (like deficit irrigation) to enhance productivity.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Heat waves	Terminal heat stress during the grain filling period affects grain formation	Mini Sprinkler Irrigation Solutions Systems equipped with fully automated decision support systems with temperature sensor to be operated to control the heat stress at the hottest part of the day during grains/fruits maturity.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
High Temperature stress	Crop yield decreases, pale colour fruits and fruit cracking	Mini Sprinkler System to be used for evaporative cooling during fruit development stages



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Cold Waves (Frost)	Sudden cold waves or black frost freezes the sap flow and crop burns.	Micro Sprinkler or Mini Sprinkler Irrigation Solution systems equipped with fully automated decision support systems with frost sensor to be operated to warm up the crop area during the frost.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Heavy Rainfall/Flood area/Cyclones/S torms etc.	Crop Loss, decrease in yield	Protected Farming Cultivation Solution Systems such as Glass-House/ Greenhouse / Farming Systems, Poly House /Net House & Tunnel Solution Systems, Hail nets, Trellies & Overhead Cable Systems, Crop Cover & Protection Systems.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Heavy Rainfall/Flood area/Cyclones/S torms etc.	Crop Loss, decrease in yield	Fertilizer and Nutritional Management Systems with fully automated decision support systems with EC/PH sensor to be operated to use precision fertilizer and nutrition applications to the crops.
		Sub-Surface drainage systems using HDPE Double Wall corrugated pipes.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Sudden or Severe frequent changes in climatic conditions in particular area	Crop Loss, decrease in yield	Jain Climate Smart Precision Farming Systems and Solutions such as Soilless Farming , Hydroponic Farming , Aeroponic Farming , Vertical Farming , Urban Farming, Indoor Horticulture systems, Speed Breeding etc.



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Climate Change Factor..Impacts & Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Electricity/ Power Availability Issue (Low power availability)	In absence of sufficient power/electricity availability limits the adoption or use of Micro Irrigation systems resulting in decrease in crop yields.	Lower head operated drip irrigation system solutions which can perform at very low pressure, as low as 0.1 kg/cm ² that reduces energy consumption.
		Solar powered drip irrigation system solutions.
		Agro-photovoltaic system solutions.



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Climate Change Factor..Impacts and Solutions..

Climate Change factor	Impacts	Solutions by Jain Climate Smart Precision Farming Systems (JCSPF)
Global Warming (Especially through crop irrigated with flood irrigation or requires standing water)	Methane emission(GHG)	Adoption of drip irrigation even for the crops presumed to require standing water e.g. rice



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THANK YOU



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