

SENSORS MAKE SENSE

How IoT-based soil moisture sensors raised farmers' resource consciousness and helped save water.



The deployment of soil moisture sensors in four major districts of Punjab registered enormous water savings, improved crop yield, reduced disease incidences, and lowered input costs. The sensors engendered a lasting behaviour change among farmers to save water and conserve resource. This is a success story of how sensors make sense for sustainability.



About Centers for International Projects Trust (CIPT)

The Centers for International Projects Trust, based in Delhi, India, is a not for profit research and development organization that works on developing and promoting new models for effective water and energy management across different regions of India. CIPT's concerted efforts are aimed at creating impact through research in agriculture, water, climate change, energy, and related socio-economic factors and promotion of innovative practices and technology, with sustainability at the heart of everything.

With its strong institutional mechanism and innovative approaches, CIPT aims at holistically addressing the issue of water in agriculture in the country through different low-cost precision technologies and practices, nexus modelling and extension methods.

CIPT is implementing a 5 years project, "Solutions for responsible water use and long-term viability of agriculture in Punjab", supported by Hindustan Unilever Foundation. This product is made possible by the support of HUF. The content of this success story is the sole responsibility of CIPT and do not necessarily reflect the views of HUF.

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Preface

A growing scarcity of water has serious implications for global food security as agriculture is the largest consumer of water. The success of Green Revolution in India resulted from assured access to irrigation water and transformed Punjab state into the 'food bowl' of India. Rising productivity, assured procurement and relative profitability of the production system, however, favoured unending intensification of agriculture led to unsustainable use of groundwater and faster depletion of the groundwater table. Since 2000, the annual depletion of the groundwater table has reached almost one meter and the annual expenditure on power subsidy in agriculture has grown by more than 10 times.

Frequent deepening of borewells was an important factor behind soaring farmers' debt and increasing distress in Punjab agriculture. Therefore, the potential solutions for the long-term sustainability of groundwater resources in Punjab have broadly

been categorized into i) crop diversification and ii) intelligent water-efficient technologies and practices. And it has been well also that both the categories of solutions offer substantive reduction in irrigation water use in Punjab agriculture and offer long term sustainable agriculture solutions.

The Centers for International Projects Trust (CIPT), Department of Agriculture & Farmer Welfare (DOA&FW), Hindustan Unilever Foundation (HUF), and CultYvate (a social enterprise) collaborated to demonstrate and promote intelligent water-saving technologies and practices for sustainable water use in Punjab agriculture. The farmers cultivate crops mainly through flood irrigation, the least water-efficient method, and despite knowing the long-term adverse implications of such practice, they usually fail to opt for more efficient methods. As a result, water productivity is quite low. In this partnership, we deployed IoT-enabled soil-moisture sensors for optimal irrigation planning during Kharif 2020 to 2022.





The Challenge of Sustainable Growth in Punjab Agriculture

Groundwater Depletion and the Changing Face of Farming

In Punjab, the “land of five rivers”, the confluence of rivers Beas, Chenab, Jhelum, Ravi and Sutlej, brews a silent water crisis. The crunch is felt acutely in agriculture. Paddy and wheat cultivation is dominant in Punjab and the demand for irrigation water use far exceeds the sustainable supply, which ultimately leads to the over-exploitation of groundwater resources. If we want to naturally supply irrigation water to our dominant crops of paddy and wheat, we need more than 400% of the annual rainfall we currently get.

How is this enormous gap between demand and supply being met? Canal water access is inadequate — at just about 23% of irrigation — and is unequally distributed, so groundwater was targeted excessively through borewell-deepening operations powered by high-horsepower submersible pumps. More than 1.4 million borewells support Punjab’s agriculture operations, which is India’s food bowl. Soon enough, farmers realised that groundwater cannot be our doormat for long and it became a vicious cycle of over-exploitation, leading to a faster

rate of depletion. The speed at which we deepened groundwater access far surpasses the rate at which groundwater table recharges, posing a threat to the sustainability of groundwater. As of today, the groundwater table is declining at an alarming rate, around 100 cm annually.

Such water scarcity comes at great detriment to the farmers, aggravating their situation. It poses a severe challenge to the farming community in the form of higher energy consumption and an incommensurate rise in the input cost of pumping

from deeper aquifers. As farming costs shoot up exponentially over time, small and marginal farmers get driven into debt, leaving farming in distress. As farming becomes unsustainable, they seek alternative livelihood options.



"In future, Punjab may become a desert if we continue using water at such pace. I urge all my fellow farmers to save water for the future generations. If there's water, there's life."

Gurdev Singh, Farmer,
Mehlawala, Ajnala, Amritsar



"At this rate of water level depletion, if we don't start using sustainable practices, we'll be left with no water for farming in the future! The water table may fall by more than 30 meter in the next 30 years. What will happen then? This should prick the conscience of every farmer right now."

Rajdeep Singh, Farmer, Rasulpur,
Jagraon, Ludhiana

Need of the hour is to develop and promote farmer friendly tools and practices, which farmers adopt immediately and willingly to save water and reduce input cost.



Taking Charge for Change

Introducing Multi-Stakeholder, Sustainability Interventions with a Focus on Community

Under the program “Solutions for responsible water use and long-term viability of agriculture in Punjab”, the Centers for International Projects Trust (CIPT) promoted well-researched and easy to adopt interventions on large scale to ensure sustainable use of water in agriculture. The Department of Agriculture & Farmer Welfare, Punjab collaborated with this project funded by the Hindustan Unilever Foundation (HUF) and provided technical support.

We’ve also leveraged partnerships with other important stakeholders in the public and private

sectors. These partnerships brought multi-disciplinary expertise and stewardship towards the common goal of sustainable water use in agriculture. Collaboration with tech organisations and social start-ups provided new technologies, tools and training instruments. Our international and national research partners have shared their expertise, while government functionaries at all levels – state, district, block — have extended wholehearted support to test and validate the proposed solutions and local institutions, particularly Primary Agricultural Cooperative Societies acted as knowledge hubs for the farmers.





CIPT introduced, piloted and promoted an array of water-efficient technologies and practices in Punjab since 2012 —also sometimes called intelligent water conservation practices — one of the prominent ones is the IoT based Digital Soil Moisture Sensors.

Program Approach



LEAD

Building capability of farmers to integrate behavior on measuring water use, use of digital sensors and incrementally shift to higher order of water saving practices through affordable technology and tools.



SUPPORT

Creating knowledge transfer on sustainable agricultural practices and technologies through training sessions, demonstration camps, and regular follow-ups for hands-on support. Building capacity of farmers through demos and field trials on diversified crops for better remunerative return.



ENGAGE

Engaging with relevant government departments (Agriculture, Cooperation) and universities. Scaling best practices through demonstration, field trials, awareness camps and support of DOA&FW.



Gearing behaviour change for sustainability through better outreach and digital technologies

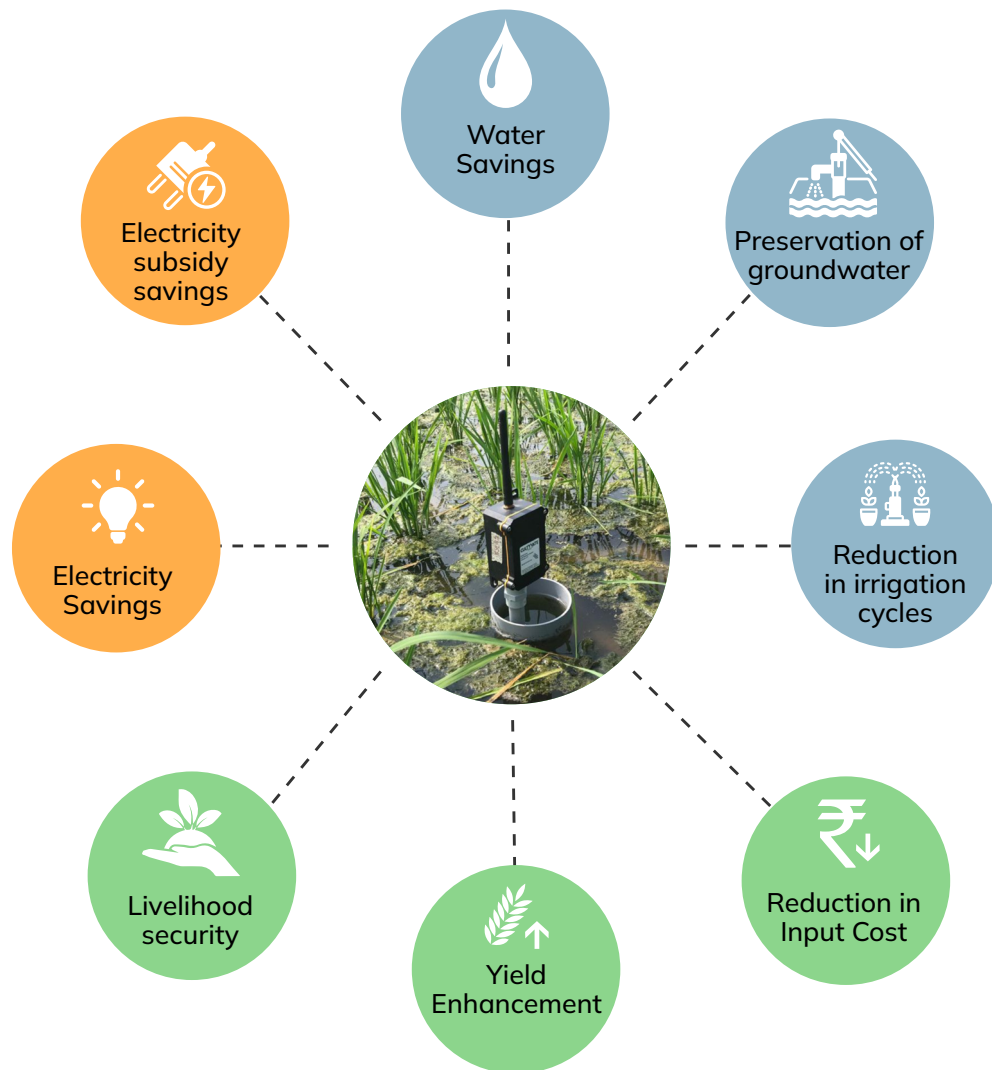
Developed and promoted the CIPT KHETI App for real-time information dissemination, supported by traditional outreach channels like flex boards, posters, flyers, Matar Patar, wall paintings and training camps.



Engaging stakeholders for collective action and enhancing capabilities

Engaging agri-scientists and extension officers, implementing with the state departments, involving community/local-level institutions, and partnering with private enterprises.

Positive Impact Touchpoints





IoT enabled Digital Soil Moisture Sensors

Ensuring judicious water use in agriculture:
Precision Technology in the fields

Digital Soil Moisture Sensor is a static device placed in the farmers' field which continuously monitors the moisture contents in the soil. Since 2014, CIPT has been engaged in developing low-cost devices to provide real-time advisory to farmers on moisture levels in their fields.

In the earlier version of a water-saving and water-optimising tool, CIPT started with a simple water-saving device — a tensiometer — as a tool to optimise irrigation scheduling for paddy. Tensiometer is a simple device with a porous ceramic cup and

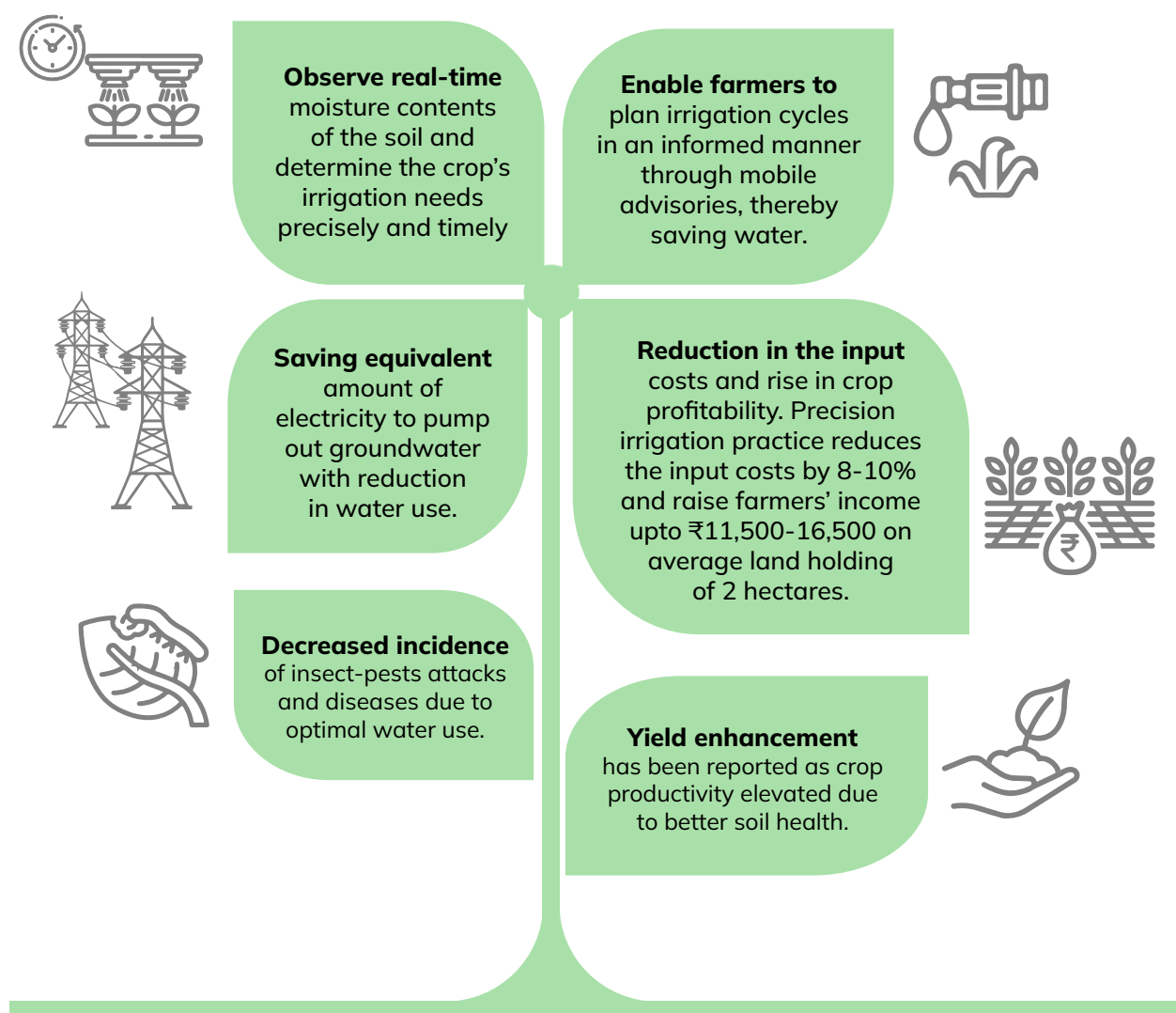
a vacuum chamber that could detect moisture availability in the soil and help systematise irrigation patterns for farmers. Tensiometer indicated when the soil moisture was below the optimal level for plant growth, giving us an informed approach to irrigation scheduling to replace arbitrary irrigation based on guesswork. Through tensiometer, more than 23,000 paddy farmers changed their irrigation scheduling in Punjab, supported by CIPT. The deployment of tensiometers showed the utility of such precision technology, which led to savings of 15-20% in irrigation water.

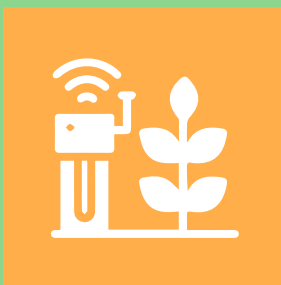
Encouraged by the results and incorporating farmers' feedback from their experience of the use of tensiometers, CIPT has introduced IoT-based digital sensors in Punjab. It is a more precise device that is capable of providing IoT-enabled smart irrigation advisory to paddy growers. In its current genre and design, the digital soil moisture sensor delivers a fully-automated Alternate Wetting & Drying (AWD) system. The IoT-enabled sensor is fitted into a pipe with holes and threshold levels are measured. The sensor collects the available soil moisture in real-time and extends advisory to the farmer when to START and STOP irrigating paddy fields. The IoT-enabled AWD system has the potential to save water up to 25-30% and increase crop yield by about 5%.

Since 2019, CIPT has collaborated with the Hindustan Unilever Foundation, Department of Agriculture and Farmers' Welfare (DOA&FW), and CultYvate (a social startup) in Punjab, to deploy IoT-based static soil-moisture sensors at farmers' fields to encourage farmers to make timely and effective decisions to irrigate their paddy fields and validate that such technologies could save irrigation water up to 25-30% when compared to the farmers who are growing paddy without using the sensor.

This multi-stakeholder partnership aims at establishing the potential of digital technologies for water sustainability and deploying them on larger scale in the farmers' fields. It will save water, reduce input costs and raise productivity.

The Benefits of Digital Sensors





How the Smart Sensor Works

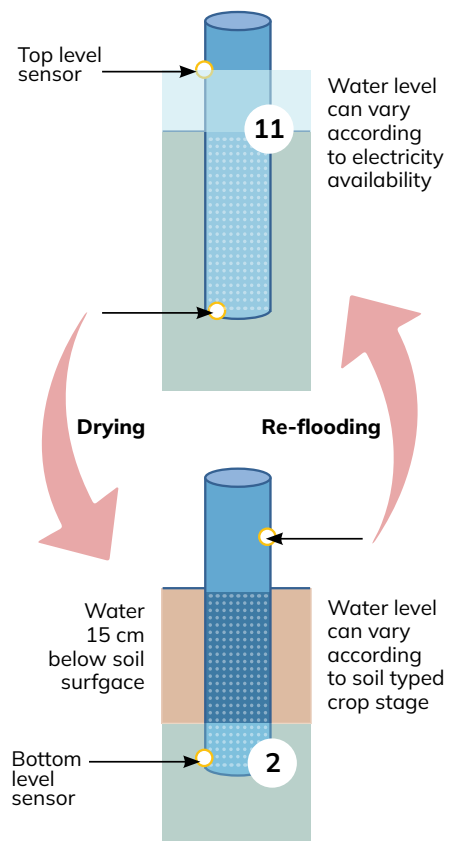
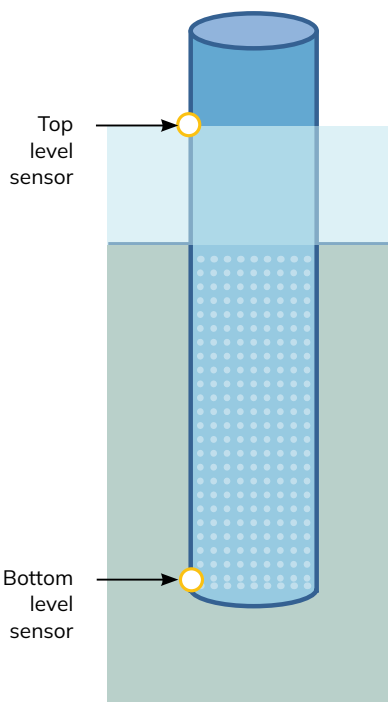
IoT Enabled Smart Irrigation Advisory to Punjab Paddy Farmers

AWD solution: Innovation

- Fully automated AWD
- Top level sensor placed at 5 cm above ground
- Bottom level sensor placed at 15 cm below ground
- Sensors detect presence OR absence of water
- Alerts farmers to start and stop the watering
- Automated pump control for advanced option



How do we measure?



AWD solution components

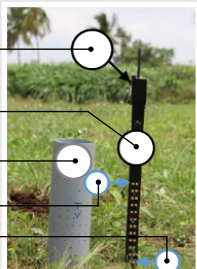
IoT Controller

Soil Sensor

Paani ka Pipe

11

2



Paani ka Pipe
and multipoint
sensor



IoT enabled
sensor –
assembled



Field
installation

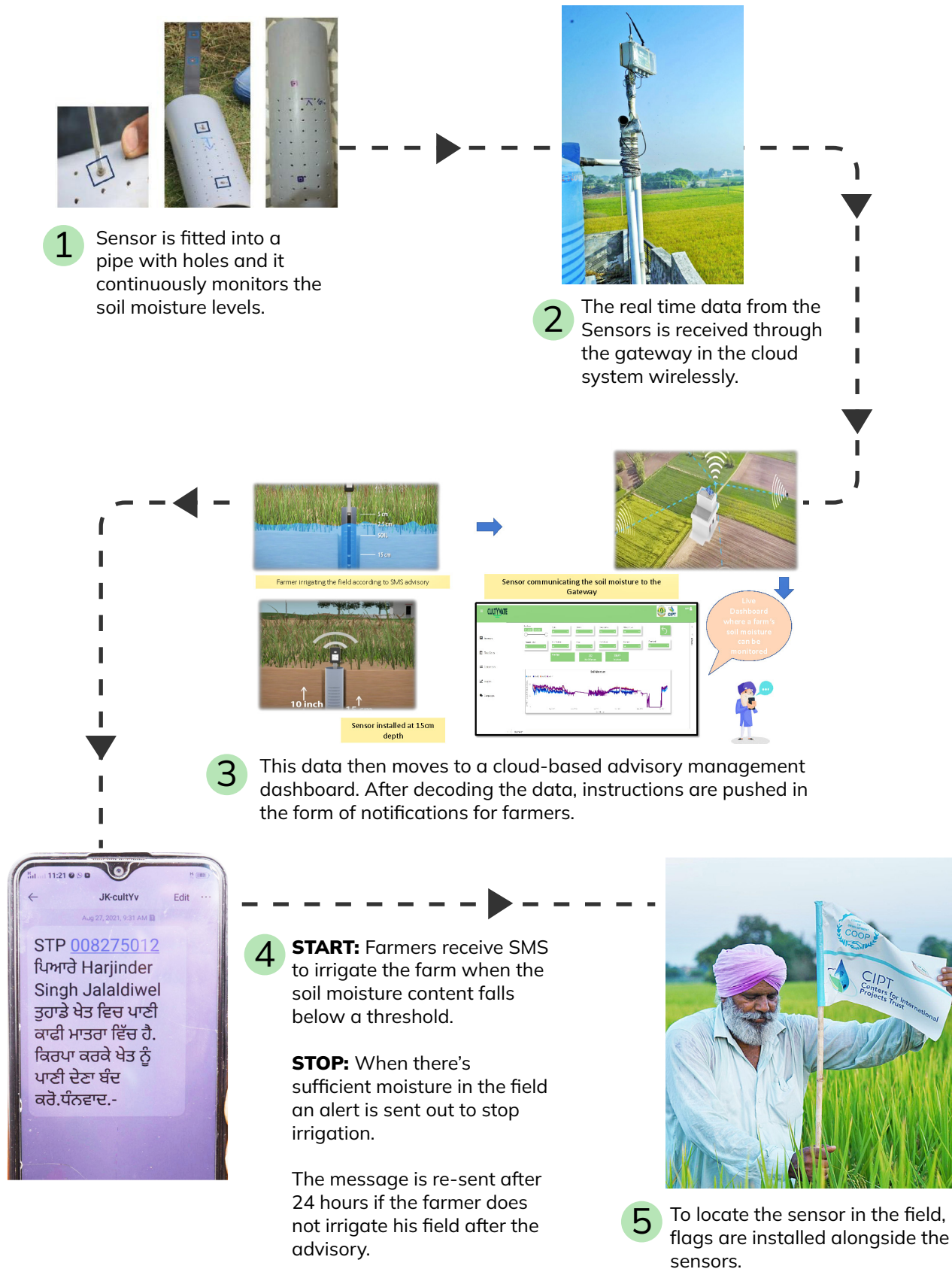


Water level
measuring
tool



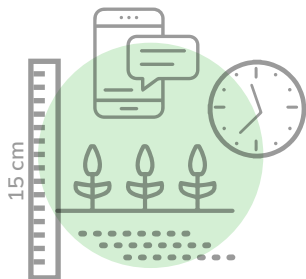
Functioning
of water level
measuring tool

Sensors' Data Capture and Transmission





How does the sensor advisory work?



STEP 1

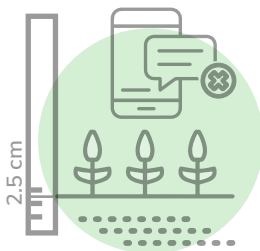
When no moisture is detected at 15 cm below ground level in your field, START SMS will be sent to you next day by 7 am to irrigate your field



STEP 2

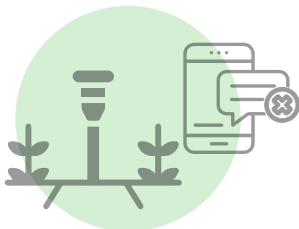
Upon receiving the SMS, you start irrigating your field

...



STEP 3

When the moisture level is detected at 2.5 cm above the ground level, we will then send you a STOP SMS



STEP 4

Upon receiving the STOP SMS, you stop irrigating your field

IoT Sensor Deployment and Real Time Dashboard

A live dashboard is set up which displays the area covered, number of advisories, farmers' adherence, water saving and electricity saving. The dashboard also displays information across villages and varieties.

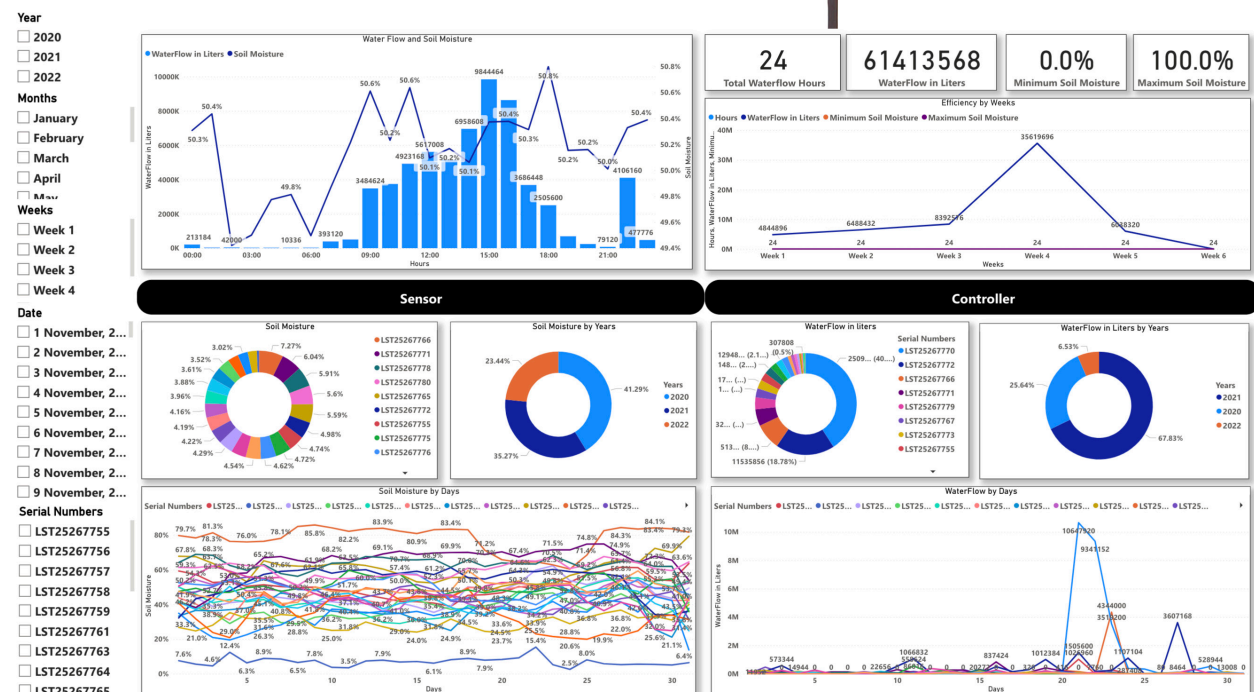


Figure: Image of a real time Dashboard





Impacting Farmers' Behaviour: Sensors making Sense

The deployment and promotion of sensors is done in tandem with other input saving and yield raising interventions which collectively activate a behaviour change among farmers for sustainable solutions in agriculture — and the larger community — in favour of sustainable solutions.

For early adopters, the absence of measurable information around optimum water levels in the field was an initial obstacle for water use behaviour change. The introduction and use of digital soil moisture sensor showed us farmers enthusiastic receptiveness to scientific methods of measuring soil moisture and follow measurement-based

irrigation advisory.

The scale of adoption of such intervention can be expanded exponentially by introducing economic incentives that reward the farmers' decision to consciously choose water efficient practices over resource-rash methods. Through the adoption of WETP, the community internalises the messaging around sustainability. This is where lasting behaviour change takes place.

This is where CIPT has played a pivotal role in the reinforcement of practices and behaviour change process.





“

To promote IoT-enabled sensors, we organized farmers' training camps intensively, ensured regular follow up through multiple personal visits and telephone calls to address any issues related to the installation and working of the sensors. The farmers are now happy with the results.”

Angrej Singh,

Field Cadre, CIPT, Amritsar, Punjab



Field Supervisor Balraj Singh interacting with a farmer in Moga district





Success Story Spotlight

Gurpreet Singh, Farmer

In Fatehgarh Korotana village in Moga district of Punjab, the farming community prides itself on its legacy: fathers & grandfathers have bequeathed the agricultural land to their next generations. It is where we met a 44-year old villager Gurpreet Singh hails from a farming family whose grandfathers and father have all passed on around 20 acres of land down the family hierarchy. Gurpreet himself has been actively involved in farming for 20-25 years. He proudly proclaims, that he successfully practiced the crop diversification by growing paddy, wheat, cotton, vegetables, turmeric, mustard, sugarcane and many other crops.

He agrees that, face of agriculture has changed over time. We may exhaust our water resources very soon," he fears. "If we keep drawing water like this, we may not have enough water even to drink in the next 10 years or so", it's only if we save water right

now that we will be able to live in the future, he says.

Applying more water to the fields doesn't help increase yield, that's a principle to understand. "Excess water in the fields leads to diseases and spoilage of crops, it depletes the water levels...more does not always mean better", he concludes.

By using digital soil moisture sensor, Gurdeep earnestly follows the irrigation advisories and does not rely on any guesswork for irrigation. Why? "The sensor shares more accurate and scientific information on the water levels in the field", he says confidently.

Gurpreet reduced 5 irrigation in paddy with water saving of 11.4% during 2021. CIPT aims at replicating such results across all the farms in Punjab.

Balwinder Singh, Cooperative Secretary

Balwinder Singh has been the Secretary of Aetiana Co-operative Society since 2012 and CIPT has been engaged with Aetiana Co-operative Society for the past three years. Balwinder Singh recalls his close experience with farming and farmers during his tenure. He shares that along with the mechanization of agriculture, he has seen many faces of farming in the last couple of years and has faced many challenges, one of the biggest challenges being the deteriorating groundwater levels. He also reflects on the challenges that the farmers of Punjab might come across in the upcoming times. He reiterates the importance of groundwater conservation and states that even though the Earth is made up of 70% water, but all

of it is not usable. Humans cannot survive without water, and with the deteriorating groundwater, we should start thinking about the same now.

He shared that farmers are willing to be part of any movement that can reduce water use in agriculture, and using digital sensors could be one such movement because it saves 30-35% of water. He feels that this new kind of water-saving device has brought judicious use of water behaviour change among farmers and all farmers need such technology solutions in his cooperative. He also suggests that only CIPT or one cooperative society cannot make all the difference, and the government should actively address these issues.



“

Aun vale samay vich
saanu bahot saari
aukhnan da saamna
karna pai sakda hai.
Sarkaar nu kisaanan
nu vittiya sahayat deni
chaidi hai, kalla CIPT te
ek sahkari inna yogdaan
nahi de sakdi.

We might have to face many challenges in the future. The govt. must provide economic support to this issue as only CIPT or one Co-operative Society cannot alone





Voices From The Field



When we installed digital sensors in our fields last year, we regularly received irrigation advisories on our mobile phones. We were amazed and followed these advisories to irrigate. The messages were accurate; our fields indeed needed water when the messages were received.

We would love to get more one-on-one attention and knowledge exchange to improve our farming methods to save water and raise our incomes."

Shamsheer Singh, Farmer,
Village Jaladiwal, Ludhiana, Punjab



With the help of the Digital Soil Moisture Sensor, we were able to better regulate the routine irrigation schedule in paddy and avoided overuse of water. This, in turn, helped us to save water, electricity and prevented crop diseases. I am keen to use this smart technology in my farm to do my bit in the conservation of natural resources"

Daljit Singh, Farmer,
Village Hararkhurd, Ajnala, Punjab



In the absence of new water saving technologies, we were over flooding our fields and we didn't stop watering even after lot of standing water".

All my fellow farmers are keen to adopt these new technologies. Soon, the whole Punjab will be able to collectively save water."

Hardeep Singh, Farmer,
Village Gurbaxpura, Sangrur, Punjab



The soil moisture sensors devices and the trainings and advice that CIPT has shared with our farmers has benefitted immensely. We want long-term association with CIPT and hope that CIPT will stay associated with us to encourage farmers to save natural resources and earn higher income through cost cutting and crop diversification".

Kulvinder Singh, Secretary, Kishanpura Kalan Cooperative Society, Moga, Punjab





“

We get messages on the need to start and stop irrigation in our paddy fields. We rely on sensor instructions now for our irrigation scheduling. The sensor guides us to water our fields when the moisture level goes down and asks us to stop irrigation when there is ample water.

It was impressive that we could get real-time status of water in our farms. Before the sensors were used, I had to personally visit the fields and check the water need of farms to decide on irrigation.

The benefits of sensors are even higher during later stages of crop as standing water can cause diseases. Preparing a better irrigation schedule can help in preventing crop losses from diseases.

Sukhpal Singh, Farmer,
Village Jalaldiwal, Ludhiana, Punjab



“

As we learnt in training camps organised by CIPT, the idea of knowing the water levels in our fields and saving water was very appealing to me. The sensor has always accurately given us instructions about the water levels.

We just abide by the sensor advisories & must have registered 50% water savings. We are committed to use these sensors in future and would recommend it to fellow farmers, too.”

Darshan Singh, Farmer,
Village Kishanpura Kalan, Moga, Punjab

“

Earlier we used to keep water standing in the fields, but now we get messages on our phone — the sensor tells us when to irrigate the field and when to stop

I now fully rely on the sensor instructions. When it indicates that fields are drying, i start watering the fields. When it tells to stop, i do so. By using proper sensor instructions, I saved 40% water. Previously I used to keep so much water standing in the fields. That much water is saved.

Excess water standing in paddy also affects the crop and invites diseases, the chemical consumption also increases. So this help us save by using sensor and less water use with sensors means savings of Rs 2000-3000 per acre”

Jaswinder Singh, Farmer,
Village Ghanaur Kalan, Sangrur, Punjab





At A Glance

IoT-Enabled Soil-Moisture Sensors: Coverage and Benefits

Coverage



4
13
8
244
244
8

Districts
Villages
Cooperative societies
Farmers
Sensors installed
Gateways installed

Benefits



972.7 lakh litres
61.26 tons
INR 3.74 lakhs

Total Water savings
Total increase in yield
Additional income generated/reduction in input cost

Change between Kharif 2020 and Kharif 2022



	Kharif 2020	Kharif 2021	Kharif 2022
Number of Districts	2	2	4
Number of Villages	4	13	13
Number of farmers / sensors deployed	40	240	244
Area covered (acres)	42	234	251.1
Water savings (%)	27	27.3	27.4
Yield increase (%)	3	3.1	3.2
Reduction in cost of fertilizer and chemical (%)	7.5	11.5	11.7

Results



1

The experiment was conducted with **245 farmers** covered across 13 villages in Ludhiana, Moga, Sangrur and Amritsar districts; out of 245 farmers, 201 farmers were classified as 'sensor' farmers and 44 farmers were classified as 'control' farmers.

2

IoT-enabled irrigation advisories were issued to sensor farmers only, and, results were compared with control farmers at the end of each paddy season from 2020 to 2022.

4

25.7% water savings were registered under adoption of IoT-based advisories

3

65% farmers followed the followed the sensor-based irrigation advisory fully whereas 16% fall into category of partial adopters, and remaining fall into category of non-adopters.

5

27% less water consumption in paddy (LDV) was observed as result of adherence to irrigation advisories & 27.2% in case of short duration varieties (SDV)

6

Higher water savings in sandy-loam soils were observed as compared to water savings in clay soils.

7

Efficient water uses also led to efficient use of inputs and **reduced cost of cultivation** by Rs 1000-1100 per acre among sensor adopter farmers.

8

Improved crop yield was also observed in range of 1-2 qtl/acre for farmers who adopted these practices.

9

27% reduction in electricity consumption was also witnessed

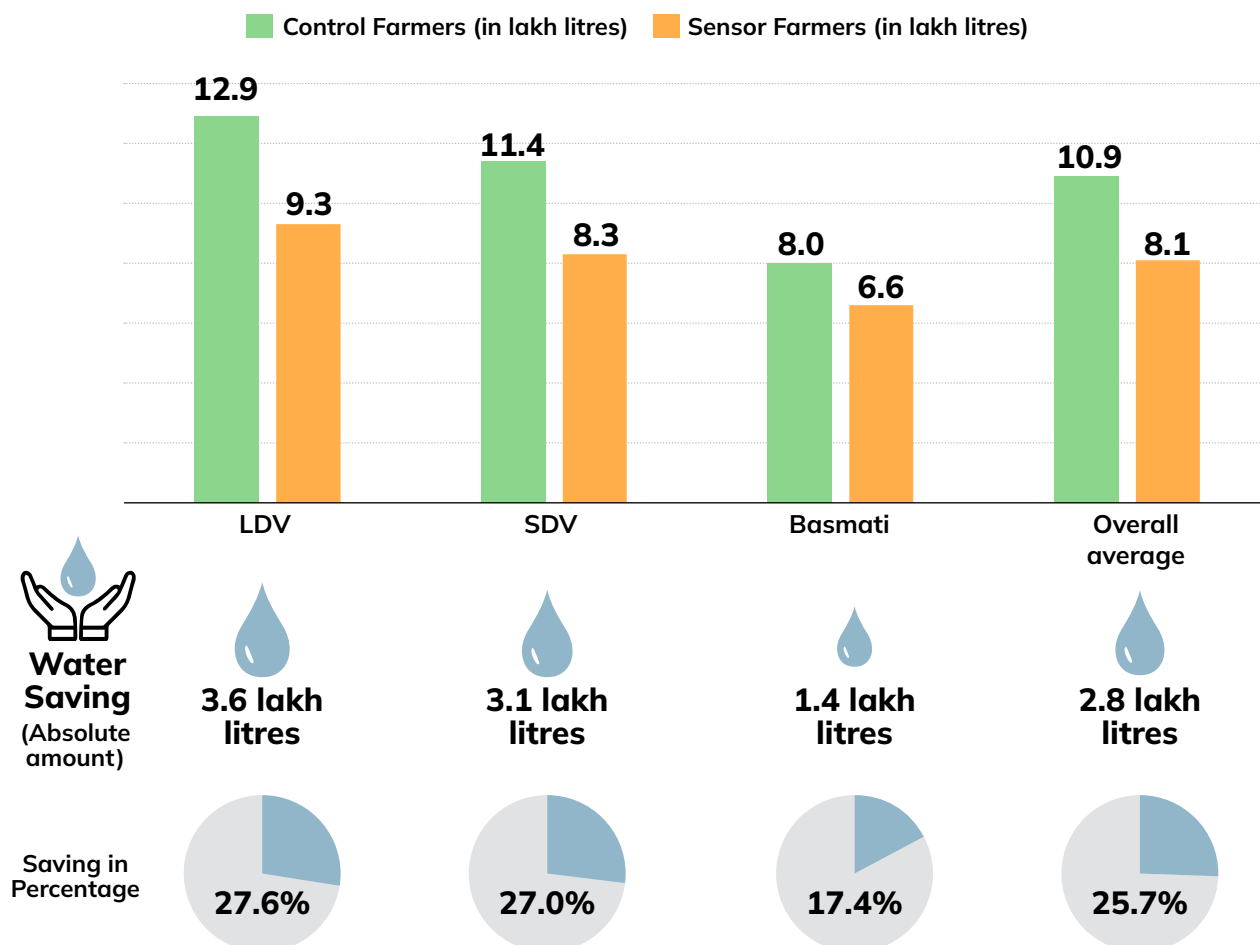
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Additionally, on an average, **121 kWh of electricity was saved per farmer** for LDV growing farmers and 93kWh electricity saved for SDV growing farmers.

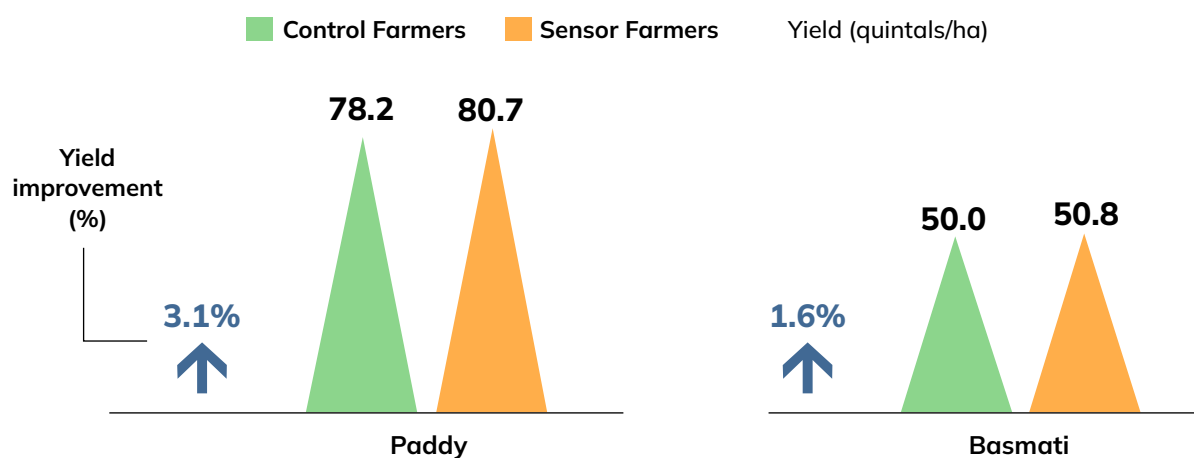


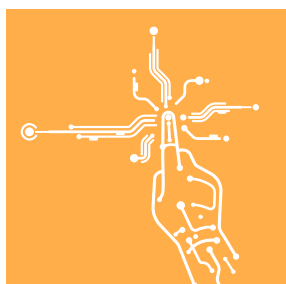
Results from last three years (2020-22)

Average Water Consumption and Yield of Sensor & Control Group Farmer and Saving



Yield of program and sensor plots (quintals/ha)





Lessons For The Future

The collaborative field experiment of CIPT, DOA&FW and CultYvate supported by HUF during the last three years (2020-2022) has successfully established that Intelligent Water Saving Technologies (IWSTs) and IoT-based farmer advisories could save 25-30% of irrigation water. Such water savings also translate to reduced power use in agriculture, lower input use, and improved yields. Easy to adopt and with significant resource savings and benefits to the farmers, these low-cost

technologies offered promising long-term solutions for sustainability of groundwater in Punjab and other parts of India. Large-scale adoption of IWSTs will also reduce the power subsidies and enhance farmers' income through cost reduction and enhanced productivity. Such results assume even more significance when crop diversification efforts are yielding relatively slower results and require a much higher financial outlay by the state.



In the Spotlight

CIPT's intervention of digital soil moisture sensor deployment also caught the eyes of the local media.



ਕੀਤੇ ਗਏ। ਵੱਖ-ਵੱਖ ਕਲਾਸਾਂ ਦੇ ਬਚਿਆਂ ਰੋਜ਼, ਨੇ ਪ੍ਰਬੰਧਤ ਅੰਦਾਜ਼ 'ਚ ਕੀਤਾ। ਭੁੱਲਣ ਵਾਲਾ ਹੈ।

ਪਾਣੀ ਬਚਾਓ ਲਈ ਕਿਸਾਨਾਂ ਨਾਲ ਕੀਤੀ ਚਰਚਾ

ਗੁਰਮੀਤ ਸਿੰਘ ਮਾਨ, ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ:

ਸਾਉਂਦੀ ਦੀਆਂ ਫਸਲਾਂ ਦੀ ਬਿਜਾਈ ਨੂੰ ਲੈ ਕੇ ਹਿੰਦੋਸਤਾਨ ਯੂਨੀਵਰਸਿਟੀ ਫਾਊਂਡੇਸ਼ਨ ਵਲੋਂ ਦੀ ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ ਕੋਆਪਰੇਟਿਵ ਸੁਸਾਇਟੀ ਸਭਾ ਵਿਖੇ ਕਿਸਾਨ ਮਿਲਟੀ ਕਰਵਾਈ ਗਈ। ਇਸ ਮੀਟਿੰਗ ਦੌਰਾਨ ਫਾਊਂਡੇਸ਼ਨ ਦੁਆਰਾ ਪ੍ਰਵੀਨ ਕੁਮਾਰ ਤੇ ਰਿਸ਼ੂ ਗਰਗ ਅਤੇ ਸੀਆਈਪੀਟੀ ਡਾਇਰੈਕਟਰ ਸੰਦੀਪ ਦਿਕਸ਼ਤ ਸਮੇਤ ਪ੍ਰਜੈਕਟ ਹੈੱਡ ਡਾਕਟਰ ਜੋਧ ਸਿੰਘ ਅਤੇ ਜ਼ਿਲ੍ਹਾ ਅਫ਼ਸਰ ਬਲਰਾਜ ਸਿੰਘ ਹਾਜ਼ਰ ਹੋਏ। ਇਸ ਕਿਸਾਨ ਸਭਾ ਦੌਰਾਨ ਖੇਤੀਬਾੜੀ ਪ੍ਰਧਾਨ ਸੂਬੇ ਪੰਜਾਬ ਦੀ ਸਰ ਜਮੀਨ ਨੂੰ ਰਸਾਇਣਕ ਕੈਮੀਕਲਾਂ ਦੀ ਘੱਟ ਵਰਤੋਂ ਕਰਕੇ ਇਸ ਦੀ ਉਪਜਾਊ ਸ਼ਕਤੀ ਨੂੰ ਬਰਕਰਾਰ ਰੱਖ ਕੇ ਜ਼ਿਲ੍ਹਾ ਫਸਲ ਦੀ ਪੈਦਾਵਾਰ ਕਰਨ ਅਤੇ ਧਰਤੀ ਦੀ ਸਤ੍ਹਾ ਤੋਂ ਡੂੰਘੇ ਹੋ ਰਹੇ ਪਾਣੀ ਦੇ ਬਚਾਓ ਲਈ ਦੀਰਘ ਵਿਚਾਰਾਂ ਕੀਤੀਆਂ ਗਈਆਂ ਹਨ।

ਇਹ ਮੀਟਿੰਗ ਸਮੇਤ ਪੰਜਾਬ ਸਰਕਾਰ ਦੁਆਰਾ ਸੀਆਈਪੀਟੀ ਕੋਪਨੀ ਰਾਹੀਂ ਪਾਣੀ ਦੇ ਡਿਗਰੇ ਪੈਂਡ ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ ਅੰਦਰ ਮੁਫ਼ਤ ਲਗਾਏ ਗਏ ਹਨ। ਇਹ ਯੰਤਰ ਕਿਸਾਨ ਦੇ ਖੇਤਾਂ ਅੰਦਰ 15 ਸੈਟੀਮੀਟਰ ਨੂੰ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਾਂ ਨਹੀਂ

ਫਾਊਂਡੇਸ਼ਨ ਮੈਂਬਰਾਂ ਨੇ ਕਟਕ ਤੇ ਝੋਨੇ ਦੀ ਫਸਲ ਬੀਜਣ ਦੇ ਫਸਲੀ ਚੱਕਰ 'ਚ ਨਿਕਲ ਕੇ ਕੁਝ ਰਕਬੇ 'ਚ ਤੇਲ ਵਾਲੀਆਂ ਫਸਲਾਂ ਬੀਜਣ ਲਈ ਵੀ ਪ੍ਰੇਰਿਤ ਕੀਤਾ। ਕਿਸਾਨ ਵੀਰਾਂ ਨੇ ਜਿਥੇ ਦੁਰਪੇਸ਼ ਮੁਸ਼ਕਿਲਾਂ ਸਬੰਧੀ ਵਿਚਾਰ ਪੇਸ਼ ਕਰਦਿਆਂ ਆਪਣੇ ਭੁੱਖੇ ਡਰਪੂਰ ਸੁਝਾਅ ਦਿਤਾ ਕਿਸਾਨਾਂ ਨੇ ਪਾਣੀ ਦੀ ਬੱਚਤ ਲਈ ਇਸ ਵਾਚ ਝੋਨੇ ਦੇ ਸੀਜਨ ਦੌਰਾਨ ਵੱਧ ਤੋਂ ਵੱਧ ਹੋਰ ਵੀ ਫਿਕਸ ਸੈਸਰ ਲਾਉਣ ਦੀ ਮੰਗ ਰੱਖੀ ਹੈ, ਜਿਸ ਦੇ ਆਉਣ ਵਾਲੇ ਸਮੇਂ ਦੌਰਾਨ ਸਾਰਥਿਕ ਸਿੱਟੇ ਨਿਕਲਣ ਦੀ ਆਸ ਹੈ। ਇਸ ਕਿਸਾਨ ਮਿਲਟੀ ਦੌਰਾਨ ਸੁੱਕਾ ਝੋਨਾ ਬੀਜਣ ਲਈ ਜ਼ਮੀਨ ਦੀ ਵੱਤਰ ਅਤੇ ਪ੍ਰਤੀ ਏਕੜ ਬੀਜ ਪਾਉਣ ਸਬੰਧੀ ਵਿਚਾਰਵਾਦਾਂ ਕਰਦੇ ਹੋਏ ਲਾਭਦਾਇਕ ਅਤੇ ਨੁਕਸਾਨਦਾਇਕ ਸੁਝਾਅ ਪੇਸ਼ ਕਰਦਿਆਂ ਆਉਣ ਵਾਲੀਆਂ ਦੁਰਪੇਸ਼ ਮੁਸ਼ਕਿਲਾਂ ਤੇ ਖੇਤੀ ਉਪਰ ਲਾਗਤ ਖਰਚ ਅਤੇ ਆਮਦਨ ਪ੍ਰਤੀ ਵਿਸ਼ੇਸ਼ ਚਾਨਣਾ ਪਾਇਆ ਗਿਆ।

ਇਹ ਮੀਟਿੰਗ ਸਮੇਤ ਪੰਜਾਬ ਸਰਕਾਰ ਦੁਆਰਾ ਸੀਆਈਪੀਟੀ ਕੋਪਨੀ ਰਾਹੀਂ ਪਾਣੀ ਦੇ ਡਿਗਰੇ ਪੈਂਡ ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ ਅੰਦਰ ਮੁਫ਼ਤ ਲਗਾਏ ਗਏ ਹਨ। ਇਹ ਯੰਤਰ ਕਿਸਾਨ ਦੇ ਖੇਤਾਂ ਅੰਦਰ 15 ਸੈਟੀਮੀਟਰ ਨੂੰ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਾਂ ਨਹੀਂ

ਦਾਅਵਾ ਯੰਤਰ ਕਿਸਾਨ ਨੂੰ ਮੋਬਾਈਲ 'ਤੇ ਮੈਸੇਜ ਦਿੰਦਾ ਕਿ ਝੋਨੇ ਦੀ ਫਸਲ ਨੂੰ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਾਂ ਨਹੀਂ

ਪਾਣੀ ਦੀ ਬੱਚਤ ਲਈ ਮੁਫ਼ਤ ਡਿਜੀਟਲ ਸੈਂਸਰ ਲਾਏ

ਗੁਰਮੀਤ ਸਿੰਘ ਮਾਨ, ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ:

ਧਰਤੀ ਹੇਠਾ ਡੂੰਘੇ ਹੋ ਰਹੇ ਪਾਣੀ ਦੇ ਪੱਧਰ ਨੂੰ ਬਚਾਉਣ ਲਈ ਖੇਤੀਬਾੜੀ ਯੂਨੀਵਰਸਿਟੀ ਲੁਧਿਆਣਾ ਤੇ ਸਹਿਕਾਰਤਾ ਵਿਭਾਗ ਪੰਜਾਬ ਅਤੇ ਖੇਤੀਬਾੜੀ ਵਿਭਾਗ ਪੰਜਾਬ ਸਰਕਾਰ ਦੁਆਰਾ ਸੀਆਈਪੀਟੀ ਕੋਪਨੀ ਰਾਹੀਂ ਪਾਣੀ ਦੇ ਡਿਗਰੇ ਪੈਂਡ ਪਿਛਾਨ 'ਚ ਕੈਦੇ ਹੋਏ ਇਕ ਡਿਜੀਟਲ ਟੈਕਨੋਲੋਜੀ ਸੈਂਸਰ ਜਿਸ ਨੂੰ ਮਿਟੀ ਦੀ ਨਮੀ ਦੱਸਣ ਵਾਲਾ ਯੰਤਰ ਆਖਦੇ ਹਨ। ਉਹ ਕਿਸਾਨ ਜਗਤਾਚ ਸਿੰਘ ਸ਼ਮਾਜਸੇਵੀ, ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਗਹੌਰੀਆ ਤੇ ਗੁਰਮੀਤ ਸਿੰਘ ਸ਼ੁਕਾ, ਦਰਸ਼ਨ ਸਿੰਘ ਇਯਾਲੀ ਵਾਲੇ ਸਮੇਤ ਹੋਰ ਵੀ ਕਿਸਾਨਾਂ ਦੇ ਖੇਤਾਂ ਵਿੱਚ ਪਿੰਡ ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ ਅੰਦਰ ਮੁਫ਼ਤ ਲਗਾਏ ਗਏ ਹਨ। ਇਹ ਯੰਤਰ ਕਿਸਾਨ ਦੇ ਖੇਤਾਂ ਅੰਦਰ 15 ਸੈਟੀਮੀਟਰ ਨੂੰ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਾਂ ਨਹੀਂ

ਇਹ ਯੰਤਰ ਪਿਛਲੇ ਸਾਲ ਪਿੰਡ ਲਤਾਲਾ ਅਤੇ ਗੋਰੇਵਾਲਾ ਦੇ ਖੇਤਾਂ ਵਿੱਚ ਲਾਏ ਗਏ ਸਨ ਜਿਸ ਨਾਲ ਤਿੰਨ ਬਿਲੀਅਨ ਲੀਟਰ ਪਾਣੀ ਦੀ ਬੱਚਤ ਮਾਪੀ ਗਈ ਸੀ। ਖੇਤੀਬਾੜੀ ਯੂਨੀਵਰਸਿਟੀ ਲੁਧਿਆਣਾ, ਪੰਜਾਬ ਖੇਤੀਬਾੜੀ ਵਿਭਾਗ ਤੇ ਸਹਿਕਾਰਤਾ ਵਿਭਾਗ ਪੰਜਾਬ ਸਰਕਾਰ ਨੇ ਕਿਸਾਨ ਭਰਾਵਾਂ ਨੂੰ ਅਪੀਲ ਕੀਤੀ ਹੈ ਕਿ ਪਾਣੀ ਦੇ ਡਿਗਰੇ ਪੈਂਡ ਨੂੰ ਬਚਾਉਣ ਲਈ ਇਸ ਡਿਜੀਟਲ ਯੰਤਰ ਦੀ ਵੱਧ ਤੋਂ ਵੱਧ ਵਰਤੋਂ ਕੀਤੀ ਜਾਵੇ। ਇਸ ਮੌਕੇ ਲੁਧਿਆਣਾ ਸਿੰਘ ਭੁਲਟੀਵੇਟਰ, ਸਕੱਤਰ ਸਭਾ ਕਿਸ਼ਨਪੁਰਾ ਕਲਾ, ਕੁਲਵਿੰਦਰ ਸਿੰਘ ਵਿੱਕੀ, ਕਿਸਾਨ, ਪ੍ਰਦੀਪ ਸਿੰਘ ਆਰਤੀ, ਸੁਖਾ ਗਹੌਰੀਆ, ਜਗਰੂਪ ਸਿੰਘ ਮੱਛ, ਤਰਸੇਮ ਸਿੰਘ ਥੋਰਾ, ਪ੍ਰਧਾਨ ਤਾਰਾ ਨੰਬਰਕਾਰ, ਭਗਵਾਨ ਸਿੰਘ, ਜਸਪ੍ਰੀਤ ਸਿੰਘ, ਵਿਦਿਆਰਥੀ ਮਨਦੀਪ

ਪਾਣੀ ਬਚਾਉਣ ਲਈ ਮੁਫ਼ਤ ਡਿਜੀਟਲ ਸੈਂਸਰ ਲਗਾਉਂਦੇ ਹੋਏ ਰਣਜੋਧ ਸਿੰਘ ਤੇ ਬਲਰਾਜ ਸਿੰਘ।

ਨਮੀ ਨੂੰ ਵਾਈ ਫਾਈ ਨੈਟਵਰਕ ਰਾਹੀਂ ਕਿਸਾਨ ਦੇ ਮੋਬਾਈਲ ਤੇ ਮੈਸੇਜ ਕਰਕੇ ਜਾਣਕਾਰੀ ਦਿੰਦਾ ਹੈ ਕਿ ਝੋਨੇ ਦੀ ਜ਼ਰੂਰਤ ਹੈ ਜਾਂ ਨਹੀਂ

ਇਲਾਵਾ ਇਸ ਕੋਪਨੀ ਦੁਆਰਾ ਸਹਿਕਾਰੀ ਸਭਾ ਸਾਧਾਰਨੀਆਂ ਅੰਦਰ ਕਿਸਾਨ ਭਰਾਵਾਂ ਦੀ ਦਿੱਤੇ ਜਾ ਰਹੇ ਹਨ ਜੋ ਖੇਤੀਬਾੜੀ ਯੂਨੀਵਰਸਿਟੀ ਲੁਧਿਆਣਾ

ਇਸ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਦਿੰਦੀਆਂ ਪ੍ਰੋਜੈਕਟਰ ਕੋਆਰਡੀਨੇਟਰ ਪੰਜਾਬ ਰਣਜੋਧ ਸਿੰਘ ਤੇ ਖੇਤੀਬਾੜੀ ਯੂਨੀਵਰਸਿਟੀ ਲੁਧਿਆਣਾ



Glossary



IoT

Internet of Things is an acronym that refers to a set of tools and technologies that connect and exchange data with other devices and systems over the Internet. The setup of the Digital Soil Moisture Sensors uses this technology.

Precision Technology

In agriculture, these refer to technologies that allow farmers to gather more precise data — sensors, aerial devices, stationary IoT solutions, and so on that gather data to optimise resource use and

AWD

Alternate Wetting & Drying is a water management technique, a method of controlled and intermittent irrigation which is an alternative to the traditional way of maintaining continuous standing water in the field.

WETP

Water-Efficient Technologies and Practices is an umbrella term used for smart water technologies, intelligent irrigation solutions, research-recommended changes in agricultural practices.



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