



GREEN INNOVATION CENTRE INDIA

NEWSLETTER #4 MAY 2020



SOME OF OUR GOALS

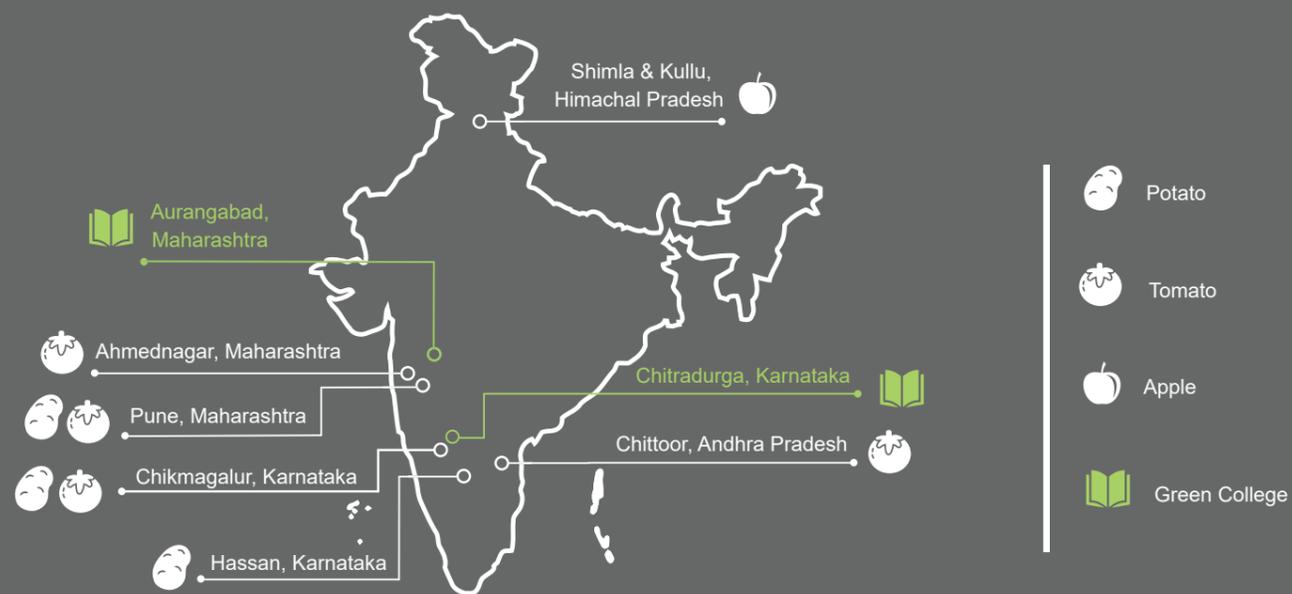


Boost the productivity & income of 111,300
SMALL-SCALE FARMING HOUSEHOLDS
 by 30% through training on
SUSTAINABLE INNOVATIONS
 in agriculture



Create
NEW JOBS
 for eco-preneurs, especially for
YOUTH AND WOMEN
 and boost up and downstream enterprises

OUR PRESENCE



OUR APPROACH

We disseminate innovations along value chains based on three crops: potato, tomato & apple

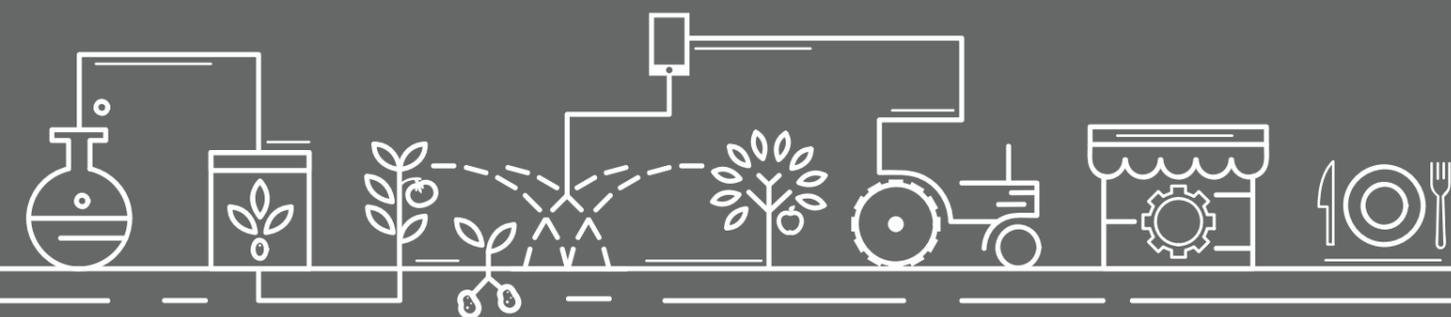


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SPOTLIGHT : DIGITALISATION IN AGRICULTURE

Dear Reader,

Welcome to the fourth newsletter of the Green Innovation Centre India!

My name is Gerrit Qualitz and since October I am the new Project Director of the Green Innovation Centre in India. As an agronomist, I am very excited to be part of this programme for which I have already worked in Ethiopia from 2016 to 2018. Currently, I am also leading the Indian Food and Nutrition Security project (FaNS), a project also under the Special Initiative *One World, No Hunger* of the Federal Ministry for Economic Cooperation and Development (BMZ). I am looking forward to build upon the successful approaches of the project and continue to develop those for long-term sustainability and positive impact on the rural farming community.

At the moment, COVID-19 has brought our fast-moving world to a standstill. We hope that during these times your family and friends remain healthy and safe. As a project we continue to support our farmers in the best possible way. In order to continue our work, digital solutions come in very handy and we are trying to make use of them more than ever. Digital communication is key for our daily work in order to stay in close contact with the team, implementing partners and government officials.

In this edition of our newsletter, we would like to focus on the importance of digitalisation and Information and Communication Technologies (ICT) and the opportunities it holds for the food and agriculture sector. Some digital innovations like our *Smart Farming App* or online market platforms like *eFresh* you already know from previous editions. Learn about our new innovations such as a mobile soil testing application or the 'intelligent potato' on pages 6 and 7.

In times of a global crisis, we keep our spirit up, support the Indian farmers, and stay committed to our target of doubling the farmers' income by 2022.

Enjoy the read,



Gerrit Qualitz
Project Director

Green Innovation Centres for the Agriculture and Food Sector, India

SPOTLIGHT : DIGITALISATION IN AGRICULTURE

Dear Reader,

With the current global situation, we need no more emphasis on the importance of bringing out innovative solutions to current and possibly near future problems to solve. Disruption in farming would perhaps be most adverse in the developing nations – here, digitalisation comes into play.

India has acknowledged the importance of ICT in every sector and became a digital pioneer by building a comprehensive ecosystem. This ecosystem includes the promotion of IT start-ups like we do at NASSCOM, efficient e-infrastructure, supportive policies, thought leadership and participation in technology enhancements.

All of this puts India worldwide at the forefront of digitalisation. The Indian Government announced a 4-Point-Strategy to support agriculture in India: 1) processing of farm wastes, 2) ensuring profitable prices, 3) reducing cultivation costs and 4) creating non-farm source of income. In this spirit, "Aspire" – "A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship" was launched by the Indian Government to set up a network of technology centres and incubation centres, also for the agriculture industry.

While India has the 2nd largest amount of start-ups globally, we need to enable more innovation in agriculture and farming, the sector which has challenges like landholding size or return for investors.

When innovation crosses boundaries of countries, and start-ups get together to seek not-yet tried solutions in the area of agriculture and food, the most critical for human survival, we call it a great initiative. The Green Innovation Centre India conducted a cross-country ICT South-South exchange in January 2020 in Bengaluru in which NASSCOM took part (read more on page 14). The 35 participants from 12 African countries engaged with the Indian IT ecosystem and met some of our Indian agri-start-ups. It could be shown that the use of IoT, Big Data, analytics, Artificial Intelligence, Machine Learning, robotics or drones has a crucial impact: from enhancing crop yield and nutrients, farm efficiency using intelligent mechanized practices, predict crop diseases, optimised financing and crop insurance to e-market place connecting producers and buyers! We are proud that other countries can continue to learn from India's expertise and ecosystem in the field of digitalisation and IT.



Navratan Kataryia

Director – Startup Engagement & Innovation Ecosystem, International Engagement, Energy/Cleantech at NASSCOM (National Association of Software and Services Companies), Centre of Excellence for IoT and AI

DID YOU KNOW?

INDIA is one of the largest producers of renewable energy, generating **17%** of the total electricity in the country.

Read how renewables can be used in agriculture on page 08.

SOME SOIL, a chemical testing kit and a smartphone camera are enough to test parameters of your soil! Read more about the soil testing app and other digital innovations in agriculture from **page 06** onwards.

It is possible to combine a potato and a tomato plant into a **'TOMTATO'** a hybrid that yields both potatoes and tomatoes.

75% India has 75% 4G internet network coverage, which makes it a prime example worldwide!

'GIGANTOMO' produces tomatoes up to 10in / 25cm wide!

1 tomato to serve 10 people: The

POTATOES have almost all nutrients humans need to survive. To prove this, the Executive Director of the Washington State Potato Commission ate nothing but potatoes for **60 days.**

10GB INDIA GERMANY

In India, 10GB data volume cost you around 210₹ / 2.50€ per month. In Germany, on the contrary, you would pay at least 1666₹ / 20€ for the same!

The apple consumption per capita in **2017** amounted to

- 20.1KG IN CHINA**
- 13.7KG IN GERMANY**
- AND ONLY 2.25KG IN INDIA.**

We are proud to share that the Government of India has announced to mark **OCTOBER 15** as **'WOMEN FARMERS DAY'**



INNOVATIONS

01

PRECISION IRRIGATION

Automated algorithm to optimise irrigation results

Monitoring your farm irrigation on your smartphone from the comfort of home and at the same time increasing yield and saving water? All possible with the system 'Water-Hand' by Farm-Hand, supported by Auroville Consulting and piloted in our project.



Although water is a scarce resource in India and groundwater levels are constantly depleting, many farmers still overirrigate whenever electricity is available. Apart from the over-usage of water, this can lead to lower yields, higher input costs and increases the risk of diseases. Furthermore, farmers have to go to the field and manually open and close valves especially during intermittent and uncertain power availability. Together with Auroville Consulting, we are currently testing a smart solution: the automated irrigation system "Water-Hand" delivers the right volume of water at the right time based on the crop's lifecycle, local weather and soil conditions.

How? With irrigation schedules based on a water balance model that forecasts crop irrigation needs. These schedules use significantly less water than incumbent practice. The schedule runs automatically and can be monitored from a smartphone app. Compared to regular drip irrigation, the estimated benefits for farmers using the system are: increase in yield, decrease in water and energy consumption and a decrease in fertilizer and labour costs as well as a reduction of damages to the water pumps as the system prevents dry runs. Water savings allow the expansion of agriculture and food production in areas where water is scarce. And the automated system eliminates visits to the plot to turn on and off valves, time which can be used for other economic activities. HP Sunil is one of the farmers testing the new technology in Kadur: "At first, I was sceptical and went to the field whenever I turned the valves on via my smartphone app" laughs HP Sunil "but now I fully trust the technology. It is worth the investment and I am recommending it to friends."

INTELLIGENT POTATO

Real-time sensor data to improve transportation conditions

'SolAntenna', an invention by the Dutch company Solentum, monitors transportation journeys to increase the quality of seed potatoes.

Healthy seed potatoes are crucial. However, the conditions under which seed potatoes are transported from A to B are often a blind spot and not known to farmers, storage owners as well as truck drivers. The quality of seed potatoes is often poor, presumably due to mishandling during storage and transport. The intelligent potato 'SolAntenna' quantifies the problem: Being placed among real potatoes during a whole transportation cycle from cold storage to lorry to the final destination, its sensors measure temperature, humidity, CO₂ and GPS location in real-time. The collected data is transmitted to the receiver via Bluetooth and uploaded to a cloud. Now it can be analysed whether the required conditions at the cold stores during transport and at arrival were met.

With this innovation, three key problems in our project areas could be detected:

1. Temperatures in the cold stores are too low (1°C while 4-6°C is required).
2. CO₂ levels are generally too high in stores as well as during transport.
3. Due to the low temperatures of the potatoes when loaded on the trucks, ambient moisture condenses on the potatoes. This leads to water flowing in the load of potatoes and high humidity in the transported potatoes, creating ideal conditions for diseases to spread.

What are the recommendations after using the *Intelligent Potato*?

1. Increasing temperatures in cold storages to 4°C, and to 15°C 15 days before taking out the seed potatoes.
2. If the latter cannot be done, at least drying potatoes in the shade 2 to 3 days before loading them on lorries.
3. Creating better air flow while stacking potatoes on lorries e.g. by packing perforated pipes in the middle of the load.
4. Stopping transportation by parking in the shade between 11am and 3pm.

Monitoring data during transportation cycles can ultimately help to improve the quality of potatoes together with cold store managers, truck drivers and workers.



SOIL NUTRIENT TESTING USING A SMARTPHONE

Cost-efficient and fast alternative to conventional laboratories

Knowing the soil's macro nutrients – on the spot, cost-efficient via smartphone app. Developed by the Foundation for Environmental Monitoring (ffem).

Knowing the amount of nitrogen, phosphorus, and potassium (NPK) or the pH value in the soil of your field is an important information for successful harvests. Different crops have specific nutrient requirements to ensure an optimum yield. There is a need for soil testing at least once a year in order to identify the nutrient balances in the soil and take informed decisions on the application of fertilizers. Until now, farmers faced multiple challenges: Soil testing in India is often lengthy and inaccurate, for example due to lack of maintenance of laboratory equipment, or it is costly in private laboratories. It can take weeks from the sample submission to receive the result report, by that time the recommendations are outdated. In some areas of India no soil testing is available at all.

One solution? On-the-spot soil testing via smartphone spectrographic for quick decisions on farm inputs. The ffem kit uses chemical reagents that react with nutrients in the soil and change colour. The intensity of the colour corresponds to the quantity of the tested nutrient. A calibrated smartphone is used to read the intensity of the colours and displays the nutrient levels. The advantages for the farmers: Testing results are available on the spot and the whole process is cheaper and as accurate as conventional soil tests. This also provides trained farmers a means to earn supplementary income by offering soil testing as a service to fellow farmers.



IN TIMES OF COVID-19

Digital interventions to combat the crises

The current Covid-19 pandemic is severely impacting people's daily lives around the globe. This has devastating effects on vulnerable communities in particular. India has entered into a complete lockdown since the 25th of March. 1.3 billion people are only allowed to leave their house for essentials – such as grocery shopping or pharmacies.

India's farmers are dependent on traders, customers, migrant workers and a functioning infrastructure for the transportation of inputs and produce. In the midst of the ongoing harvest season, many markets and shops were closed, labourers got stuck in their native places or are not allowed to be hired, some farmers have stopped their production, up- and downstream enterprises are losing their business, produce got stuck at interstate borders, meetings of farmers to exchange knowledge are on hold. However, the confusion and chaos from the beginning of the lockdown got eased off as the central government brought necessary amendments.

In times of social distancing, creative digital solutions are more important than ever. The Green Innovation Centre explores the efficient usage of digital platforms to support Indian farmers during the lockdown:

1. Our partner Skillgreen offers online courses for Farmer Producer Organisations (FPOs) for example on safety practices while doing business.
2. WhatsApp group chats and video calls have already played a crucial role for information exchange between farmers before the lockdown. Now more than ever farmers rely on digital communication to exchange advisories on pest and disease, soil health as well as fertiliser management.
3. Farmers receive support in setting up and using online banking to ensure timely payments.
4. Farming-related apps such as the 'SmartFarming App' on potato cultivation are being increasingly used. Technical coordinators have supported 60 farmers in installing the 'Plantix App' which helps in diagnosing pests and diseases in crops.
5. Support in obtaining e-passes for transport permissions online.
6. Call centres are established in various districts to support farmers individually with day-to-day challenges.
7. Our partner Sahaja Organics broadcasts radio shows on FPO's response to Covid-19 crisis to farmers.

These are some first examples to bridge the difficulties of current restrictions. We are convinced that even more creative solutions will emerge within the coming weeks to support the farmers during these times.

“ENERGY EFFICIENCY AND RENEWABLE ENERGY BASED SOLUTIONS STRENGTHEN THE VALUE CHAINS”

Study on sustainable energy solutions along the tomato and potato value chains

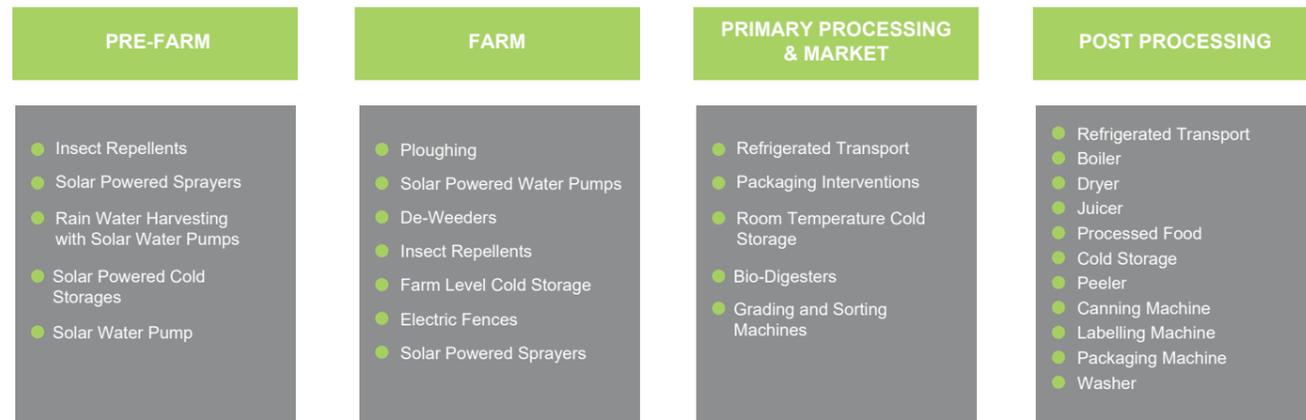
by Sashi Kumar, GIZ Technical Expert for Renewable Energy



With a 17% share of India's electricity supply, agriculture is one of the largest consumers. Most electricity is used to operate irrigation pumps. Many other farm activities remain manual or are centralised due to unavailability of sustainable energy and an appropriate ecosystem. With free electricity through state government schemes for farmers, issues like over-pumping of water are leading to an abuse of already depleting water tables at an alarming rate. The uptake of cheap energy and inefficient technologies prove unsustainable in the longer run, resulting in a pattern of increasing consumption. This again results in hikes in environmental and economic costs that one or the other in the system has to bear.

The Green Innovation Centre India is already implementing renewable energy innovations in the field, such as the solar light trap. In order to expand the activities in this sector, the Green Innovation Centre India has undertaken a study in collaboration with the SELCO foundation to uncover sustainable energy solutions in the tomato and potato value chain in the states of Karnataka and Andhra Pradesh. The goal was to document and recommend affordable energy-efficient and renewable energy technologies for small-scale farmers.

The study listed the most suitable possible areas of intervention for renewable energy along the tomato and potato value chain.



Energy gaps and potentials for renewable energy along the tomato and potato value chain:

Key Findings	Potential Solutions
Accessibility to water is a major challenge for Andhra Pradesh tomato nursery farmers.	Rainwater harvesting and solar water submersible / surface pumps, cocoponics, and compost machines for on-farm wet waste.
Most of the marginal farmers own ½ acres of land. They hire few to no labourers as they cannot afford more. Irrigation is rainfed.	Solar-powered de-weeders and solar-powered sprayers
Unavailability of labour during grading of tomato	Solar-powered grading/sorting machines.
Tomato sapling wastage in nurseries	Customised solar-powered hydroponics small scale compost machines for on-farm wet waste
Pest-infection of the crop	Solar-powered sprayers
Market level waste due to procurement and transportation of produces	Biodigester to convert the waste into solid waste
Lack of appropriate technology for food processing	-Solar-powered dryer -Boiler for making tomato paste -Refrigerated transport -Processed cold storage
Lack of local seed potato production	Customised cold storages for seed potatoes
Inconsistent electricity supply for irrigation	Solar-powered water pumps for irrigation

Limitations with the technology recommended

The renewable energy technologies recommended are additional expenditures for farmers. In order to convince them to make such investments, the farmers need to be oriented about long-term benefits of using renewable energy technologies, such as future savings. For example: opting for a solar water pump might be more expensive than a grid-connected pump in the first place but in the long-run the farmer can save recurring costs for electricity or diesel.

Conclusion

The study concludes that energy efficiency and renewable energy based solutions do strengthen the value chains. In order to develop a scalable and affordable model, the ecosystem needs to be strengthened with an appropriate financial product, business models and capacity building of farmers. If solutions are implemented through the support of all stakeholders, sustainable energy can prove to be a trigger to ensure long-term financial and environmental sustainability for the farmers.



Smart Farming
Click for all information regarding potato crop

User Profile
Fill in information about you & your farm & get complete information about potato crop

Daily advice
Find daily information on what to do today

Pre Planting
Early selection, seed sowing, farm layout preparation & planting distance

Spraying
Information about preventive measures for pest & disease management

Irrigation
Proper management of water required for potato crop

Functions of the app

User profile for tailor-made advices

Quick search for finding info immediately

Practical day-to-day advices

Learn which spray when to apply

Information about: varieties, seed potatoes, land preparation and planting

Identify the pest & disease



9-10 JUL

Inception meeting WELL
Auroville, Tamil Nadu

Together with the GIZ Energy Cluster, our project is implementing field trials on the Water-Energy-Livelihood-Nexus (WELL) on precision irrigation to save water and thus energy.

15-24 JUL

South-South exposure on Farmer Producer Organisations (FPOs)
Hyderabad and Bengaluru

Partners from our African sister projects in Benin, Cameroon, Ethiopia and Mozambique visited India's experts and innovation farmers to exchange on business, management and governance strategies for FPOs. The participants took home advices such as small groups and simple operations for FPOs in the beginning, and business models, such as member-orientation and a balanced governance between strong leadership and democratic structures.



AUG

Opening of FPC shops
Kadur, Hassan

Recently established Farmer Producer Companies obtained their licenses to sell fertilisers, agro-chemicals and seeds. They also obtained permission from local authorities to open shops and were able to secure exclusive dealerships for some unique inputs from manufacturers.

3-5 SEP

Fifth Partners Meet 2019
Bengaluru, Karnataka



More than 70 participants from more than 30 organisations, departments and institutes – including Secretary Rajendra Kataria, Department of Agriculture Karnataka – pushed their alliance to promote India's agricultural sector, discussed green innovations and their long-term implementation and upscaling.

JUL AND NOV

Milestone Mechanisation: Tomato transplanter and potato planter
Narayangaon and Peth, Maharashtra

A tomato transplanter ordered from Italy was tested in the field. The survival rate of the seedlings was 99%, resulting in an improved stand compared with manual planting. Further, an automatic single row potato planter was tested in Maharashtra. Its highlights: Very precise dropping of potatoes and excellent germination results.



16-20 SEP

Regional Conference of all Green Innovation Centres
Malawi 2019

All 15 Green Innovation Centres met last year in Malawi. The Indian team presented its ICT innovations. Our political partners Secretary Rajendra Kataria, Department of Agriculture Karnataka, Shri Chiranjiv Choudhay, Commissioner of Horticulture Andhra Pradesh and Shri Sudhakar Balasaheb Borale, Sub Divisional Agriculture Officer Maharashtra were present.

15 OCT

Change of Project Director
Bengaluru, Karnataka

After more than three years, Mr Jonathan Ziebula concluded his assignment as Project Director of the Green Innovation Centre India. The team wholeheartedly thanks him for his great commitment and achievements. We are also happy to welcome Mr Gerrit Qualitz as his successor.

3-5 OCT

Visit from GIZ headquarters
Hassan and Kadur, Karnataka

High delegation of Mr Andreas Proksch and Ms Christel Weller-Molongua from GIZ GloBe department in Bonn, together with Dr Julie Reviere, Country Director GIZ India, paid a visit to our field activities in Karnataka. Especially the self-esteem of farmers and their willingness to try new innovations was appreciated by the delegation.



4-8 NOV

Gender exposure visit with SEWA
Ahmedabad, Gujarat

A visit to the 'Self Employed Women's Association' (SEWA) Ahmedabad, Gujarat, for selected women farmers from Karnataka, Maharashtra, Himachal Pradesh and Andhra Pradesh promoted entrepreneurial skills and business development.

9-16 NOV

Mechanisation study tour to Agritechnica
Hannover, Germany

Eight African countries and an Indian delegation consisting of private sector and government representatives took part in the working group study tour to the fair 'Agritechnica'. As an outcome, the Indian machine manufacturer Rohit is planning machine adaptations for the African context together with CIMMYT and the University of Hohenheim.

NOV '19, JAN '20

Visits to Punjab to purchase seed potatoes
Peth, Maharashtra and Hassan, Karnataka

The project facilitated the Board of Directors of FPCs and Farmer Study Groups to place orders for quality seed potatoes from Punjab. Some excellent seed potato farmers were identified and a group of farmers went to Punjab to visit the fields of those farmers to start negotiations on purchase of different varieties based on the quality of the crop seen in the field.

9-12 JAN, 16-19 JAN

Agricultural exhibitions at KVKs
Narayangaon and Baramati, Maharashtra

More than 110,000 farmers visited the Green Innovation Centre's potato and tomato stall. We demonstrated innovations along both value chains and provided lectures on current topics, such as white fly management which poses a big problem for farmers in Maharashtra.

11-14 FEB

DGRV Trainings on governance and management of FPOs
Bengaluru, Karnataka

With DGRV, state-wise trainings to representatives of FPOs were conducted to discuss on best practices, soft skills, business planning, strengthening of governance and management of FPOs.

NOV '19 - FEB '20

Capacity building events and Green Trade Skill Analysis by Welthungerhilfe
Maharashtra

Collaborative FPO capacity building events were conducted by the social enterprise Skillgreen across the country based on the FPO manual published under the project. Also, a 'Green Trade Skill Analysis' for the IIRD Green College in Maharashtra was conducted jointly by Civil Society Academy and the National Skills Foundation of India (NSFI).

13-16 FEB

BioFach 2020
Nuremberg, Germany

Three members from the company 'Sahara Organics' participated and exhibited their products such as turmeric and jaggery. They also presented on German cooperation and the importance of organic farming in India.

10-12 NOV

Field visit of BMZ
Pune, Maharashtra

BMZ Department Head Sebastian Lesch, Country Director GIZ India Dr Julie Reviere, Cluster Coordinator Mohamed El-Khawad and Project Manager Wendy Zavala Escobar visited the project region in Maharashtra, including a tomato market, as well as an exhibition on innovations and mechanisation.



20 JAN

Trials on enriched organic manure
Andhra Pradesh

Together with the renowned organisation 'Carbon Masters', the project entered into a trial on enhanced and bioenriched organic manure.

27-31 JAN

South-South exchange on digital solutions in the agriculture and food sector
Bengaluru, Karnataka

We welcomed 35 participants from 12 African countries. The main outcomes were: enhanced awareness and knowledge on digital solutions in agriculture, exchange about ICT solutions in Africa and India, demonstration of technologies on the ground, networking and establishing of business contacts (read more on the following pages).

9 MAR

First State Level Committee meeting on tomato value chain development
Dr. YSR Horticulture University, Tadepalligudem, Andhra Pradesh

The Dept. of Horticulture, the Dr. YSR Horticulture University, APMAS, GIZ and representatives of FPOs have participated in the first state level committee meeting on tomato value chain development (TVCD). It was decided to work on the promotion of processing varieties of tomatoes and to establish linkages between tomato farmers and processing units. Subsequently, GIZ entered into an MoU with the university for mutual support in research activities, sharing technical expertise, knowledge management, applied research studies and capacity building. Two manuals in Telugu were released covering Package of Practices (PoP) on tomato as well as on nurseries.



SOUTH-SOUTH EXCHANGE ON ICT4AG: INDIAN DRONES MEET AFRICAN TRACTOR APPS

12 African countries, 5 days in India, 1 mission: The ICT working group of the Green Innovation Centres brought partners together on digital solutions in agriculture.

Blockchain – hype or an essential technology for food traceability? Apps for smallholder farmers in Africa – applicable to the Indian context? 4G coverage and smartphones in many households in rural India – what can African partners learn from this impressive e-infrastructure? These and many more questions were in focus of the South-South exchange on Information and Communication Technologies (ICT) in the agriculture and food sector. The outcome? Fruitful discussions, valuable business linkages and inspiring ideas for digital solutions in the field.



End of January, India hosted its third South-South exchange of the Green Innovation Centres. 35 experts from the private sector, governments and implementing partners from 12 African countries came for the five-day programme on digital solutions in agriculture in the global South.

“South-South knowledge exchanges like this bring together different important partners from various countries. It is a unique opportunity to learn from each other, to build new networks and to transfer & up-scale innovative ideas and solutions between countries.”
Dr Ariane Borgstedt, head of the global project Green Innovation Centres for the Agriculture and Food Sector, GIZ Germany

DAY 1 : Exercises to understand the ICT landscapes and framework conditions in India and Africa: Controversial expert talks on Artificial Intelligence (AI), Internet of Things (IoT), Blockchain or data ownership and sustainability of digital tools gave food for thought about the existing chances and risks of digitalisation.

DAY 2 : Innovative start-up slam in a co-working space: Indian and African start-ups pitched their ICT solutions in three minutes along the agricultural value chains followed by 20-minutes speed dating sessions. The business-to-business rounds made detailed networking possible. In a voting, the slam was won by the Ghanaian start-up TROTRO Tractor.

START-UPS PRESENT

Gramophone India One-stop solution for inputs	CropIn India Decision-making tools	Karabi Software India Business process management, accounting, inventory and asset management	Smart Soft Pro Tunisia Online irrigation platform based on IoT, artificial intelligence and machine learning	E-Agribuiness Togo Digital data collection system, web and mobile platform for publishing offers and requests for agricultural products
AgroCenta Ghana Digital food distribution platform	Viamo Burkina Faso Decision-making tool	TROTRO Tractor Ghana Digital platform for tractors and other agricultural machinery services	Stellapps India End-to-end dairy technology solutions company	Satgri Mali Sensors and satellite images for soil requirements
Ecozen India On-farm cold storage	Seabex Tunisia Smart irrigation solution	Skycrafts Aerospace India End-to-end spraying solutions using drones, IoTs and Blockchain	AgroWave India Linking farmers to retailers for better market prices	SourceTrace Systems India Farmer advisory services, supply chain management, traceability, certification, monitoring and evaluation, market linkage and financial services
Ezzayra Tunisia Precision irrigation system	TraceX India Traceability solutions along the value chain	IntelloLabs India Matching quality to specifications using image analysis and AI	Tene-AG India Software platforms for agricultural extension	
AgNext India Platform for instant quality assessment and traceability linkages	Digital Green India Training frontlines workers, connecting farmers to markets			
CultYvate India Customised smart irrigation solution using AI & IoT	Esoko Ghana SMS platform and voice messaging to disseminate information			

“I thought this was going to be one of the usual talk shops where participants are brought together to discuss the obvious. The ICT study tour turned out to be very insightful for me. Learnt a lot from seeing how India uses technology in agriculture. Given that we have similar problems, these are lessons that could be applied though not in their entirety. I’ve got some ideas now on where to introduce some elements of IoT in our platform.”
Michael Ocansey, AgroCenta, Ghana

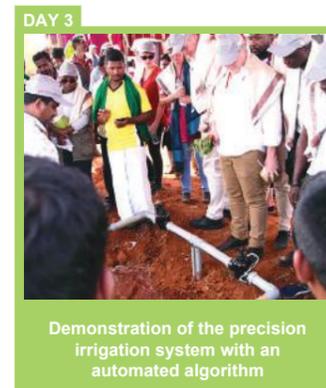
Video Link for South-South Exchange



<https://www.youtube.com/watch?v=GnlBrvA775w&feature=youtu.be>

DAY 3 & 4 : Field visits to Kadur and Hassan: How does the reality look like on the ground? What do tomato and potato farmers have to say about apps, algorithms and AI? The participants got insights in the farmers’ day-to-day work with the new technologies, for example: *“What convinced you to use the new IT technologies?”*, *“How many women in your household own a smartphone?”* or *“Are digital solutions an incentive for the youth to get engaged in agriculture?”*

DAY 5 : Participants were eager to transfer and adapt solutions to their home countries’ contexts: The ‘ConseilCaféCacao’ from Côte d’Ivoire for example expressed interest to collaborate with the Indian start-ups ‘IntelloLabs’ and ‘CropIn’ to tailor their solutions to the coffee and cocoa value chain. Tunisia decided to work on ecosystem for start-ups similar to the one they have seen in Bengaluru. Kenya showed interest in the Ghanaian machine rental app ‘TROTRO Tractor’. Amongst the “B2B” linkages is also Bourehima Coulibaly (Satgri) from Mali Convinced with the demonstration of the mobile soil testing kit he – as well as delegation members from Ghana and Zambia – purchased it directly from the Indian start-up Foundation for Environmental Monitoring (FFEM).





“THE SMALL LAND HOLDING FARMER HAS TO BE THE CENTRE, NOT THE TECHNOLOGY”

Blockchain, IoT, Machine Learning, AI – just a hype? Who pays for it? Who uses it? A critical few on the risks and challenges of digitalisation in agriculture.

Guest contribution by Ananth Krishna

The question we start with is: Who pays for IT or ICT services in agriculture? Will the farmer? How? When? Why? Who is the stakeholder that is paying for it if not the farmer? Or is it the duty of the government to provide all for free, for the public good? If others are paying, is it product sales, data grab or charity? A tough payment culture exists out there. Farmers are reluctant to pay, the farmer income cash flow is uncertain and inconsistent, more so in the times of climate change, and it is extremely hard to collect in rural hinterlands.

88% of India’s farmers are small land holding farmers (and many landless as well), with less than four acres, more than half of this solely rain-fed. They speak a multitude of languages by regions with different scripts and dialects. And while smartphone penetration has increased exponentially thanks to cheap accessible high-speed internet, it is still heavily skewed to men and most of them less than 35 years old. WhatsApp cannibalizes the phone, and YouTube is the mainstay, predominantly for entertainment, leaving not much space in the phone or the mind.

Electronic wallets, e-banking abound, but adoption is slow. Cash is still king, credit offered by local merchants is the habit. So digitalisation to the farmer has its challenges. Business models for extension, marketplaces and services through smartphones specifically Business-to-Consumer/Farmer (B2C/B2F) have had scant success, and many start-ups blowing investors’ money have bit the dust. Business-to-Business (B2B) models have had better traction and now riding on the government push to consolidate small land holding farmers into Farmer Producer Organizations/Companies (FPO/FPC) hoping their collective would succeed with consolidation and scale. So a lot of start-up action in harvest aggregation with FPOs, warehousing and financing with electronic receipts, online auctions, and marketplaces for this FPO’s aggregated produce and logistics is heating up, again, but are they positioned for a long slow run though? FPOs need some serious hand-holding while they grow up, more so in human capacity building than being dumped on with technology.



Ananth Krishna, Founder of Shekru.Foundation, spoke to the participants of the ICT South-South exchange (see page 14) about the controversies, risk and challenges of ICT solutions in agriculture.

Supply chain transparency, efficiency, consistency and direct to consumers takes centre stage ahead in the post corona world, and rightfully should but do they really need Blockchain? A simple QR or a bar code can do, why do we need a white elephant in Blockchain? As someone said, Blockchain is a solution in search of a problem. There are significant overheads, skillsets are scarce, expensive and many in the chain may not have the budget living on frugal margins. Normal contracts are a challenge as it is, what are smart contracts going to do?

The government on its part has to be appreciated for the technology push with its various programs like soil health card, cattle tagging, online schemes enrollment, direct cash transfer, incubators at various institutions, generous grants for startups and specifically with the open datasets initiatives in this context. However, there is some caution and deep thinking required especially when it comes to Machine Learning (ML) and Artificial Intelligence (AI) and widespread evangelisation in the establishment. The quality and reliability of data has to be good, the collection methods of this data has to be transparent and foolproof to be useful. Satellite-based imagery with localised accurate agrometeorological advisories, IoT based precision agriculture, drone spraying fertilizers, all broadly hold tremendous potential, but they seem a decade away in terms of their usefulness, reliability and consistency based on ground reality and viability. There is a blasé view for data privacy and security out there, as many claim the benefits of technology outweigh the risks. There are benefits of technology of course, there are numerous success stories out there, and there is no doubt that technology can be a game-changer. We need perspective though, we need patience, we need frugality, we need to be gender-sensitive, we need credible, holistic information and we need localized vernacular solutions adapted to our ground reality. At some point, if we want to have real impact, the small land holding farmer has to be the centre, not the technology.

VOICES FROM... 03

GENDER EQUALITY IN AGRICULTURE

“The age is still young to have more babies” - How societal roots impact gender equality along the apple value chain in Himachal Pradesh

How are women engaged in apple cultivation in our intervention areas? How can empowerment for women take place? How can men contribute to gender equality in apple farming? A gender analysis in Himachal Pradesh among apple farmers revealed gaps and insights.

Guest Contribution by Suhasini Huddone, GIZ Technical Expert for the apple value chain and Gender Focal Point

“When a boy is born, grand celebrations happen, including fireworks, liquor and non-vegetarian food, society congratulates the family wholeheartedly. When a girl is born, the family does not declare it openly, there are muted celebrations and people usually react with statements like “Kuch nahin hota” (“No issues”), “Jaan to Bach gayi” (“At least the mother is safe”) and “Abhi Umra hi kya hui hai” (“The age is still young to have more babies”). Guests are served vegetarian meals.”



“While Rajesh starts his usual work day on his apple farm around 6am with a walk, breakfast and the news, his wife Kamla wakes up by 5am, clears the bed, cleans the house, prepares breakfast, washes utensils, gets the children ready to school, feeds the cattle, milks the cow – and has some breakfast in between.”

This “daily schedule activity” after the Harvard framework with workshop participants in Himachal Pradesh revealed among others that typically:

- a) Women wake up earlier and sleep later than men and work for longer hours than men.
- b) Women multitask more than men as men mostly do farm work and women help in farm work along with numerous tasks at home.
- c) Men have more leisure time than women.
- d) Women have less choice of work as the household chores are mandatorily her duty and these cannot be skipped.

Despite the unequal distribution of work between women and men, the value of a woman’s work is less and is often taken for granted.

These examples give a glimpse of the status of Gender in the apple value chain in Himachal Pradesh.

Gender inclusiveness is an integral aspect of all our interventions – right from the planning phase. Our objectives include:

1. Creating employment in up- and downstream enterprises, at least 600 jobs for women.
2. Training and competence building of over 140,000 stakeholders and farmers along the value chain, including 35 per cent women.
3. Improving sector conditions by promoting a gender-enabling environment.

To achieve this, a thorough Gender assessment including four workshops of two days each was done in November for the apple value chain in Himachal Pradesh for the districts Kullu and Shimla.

What are the main outcomes? Despite the patriarchal society in Himachal Pradesh, women employed within the apple value chain reported few discriminatory practices and acknowledged that there has been a positive change concerning the provision of equal educational opportunities and value to girls and boys alike. However, the gender analysis workshops clearly highlight the deep-rooted gender imbalances within the work participation, economic independence and decision-making power that women hold within the community.

In India, 85% of rural women are engaged in agriculture, yet only about 13% own land. (OXFAM, 2018)

Since this imbalance and overall lack of control over money, land or decision-making is viewed and accepted as a societal norm, it is important to address these sociocultural norms to lay a strong foundation for any interventions aimed at bringing about gender equity. Further, advocacy efforts at various levels including the State Agricultural Departments, Horticulture Mission, District and Block Administration, and Gram Panchayat levels are required to introduce more gender-neutral policies. Despite schemes introduced by the government to address the gender issues, the awareness and therefore utilization of benefits by women farmers have been poor. Assessments with women groups reflect the enormous knowledge and skill gap that needs to be filled. The Green Innovation Centre India, with its existing strength of innovation agents on the ground, has a bandwidth to increase women empowerment in the project area within its mandate through knowledge building, skill up-gradation and provision of linkages with schemes and employment generation avenues.

As of now, women are mainly engaged in weeding activities and collecting woods after pruning. However, there is a big potential in the apple value chain to enhance women’s participation at all levels of the chain, specifically in processing and marketing. In this regard, the workshop revealed that women are interested in making apple chips, apple cider and apple jam and in marketing these products under their own brand. This would not only enhance the women’s participation but is also an opportunity for selling and utilising C grade produce.

“ENOUGH” TO EAT IS NOT ENOUGH

Study reveals nutrition situation in rural Hassan

A study conducted in Hassan, Karnataka, by the German Center for Development Research shows nutrition challenges in rural India and identifies solutions, namely diversifying crops and market access.

Guest Contribution by Till Ludwig

India faces the so-called triple burden of nutrition: On the one hand, diets rich in fats and sugar are becoming more popular and overweight rates are increasing, mostly in cities. On the other hand, large parts of the rural population suffer from underweight. Also, the lack of micronutrients such as vitamins and minerals leads to severe nutrition insecurity. Till Ludwig former researcher of the Center for Development Research in Bonn and now working for the GIZ, conducted a study for the Green Innovation Centre India. He found that rural Hassan, located in the state of Karnataka, is better off than many other rural areas in India: Food security, meaning sufficient calories to eat, is largely given in the project region. But only half the households reported the consumption of a diet that is rich in micronutrients, which means that only half enjoy nutrition security.

The study identifies two ways to improve nutrition security: Project farmers mostly grow potatoes and cereals. Diversifying the crops, thus also growing fruits and vegetables, allows a more complete diet. Further, market access can be decisive. When farmers are able to sell their produce and buy other food items, a rich and balanced diet can be secured. Reducing transportation and transaction costs for food products can be key to achieve food and nutrition security in Hassan. In a succeeding step, Till Ludwig, also identified the likelihood to have a more balanced diet based on the farmers economic preferences. The study reveals that risk-taking farmers and relatively impatient farmers tend to have a more balanced diet than risk averse and patient farmers. Furthermore, high levels of altruism have a balancing effect on nutrition security of the household. Hence, the policy recommendations indicate that market access as well as diverse production systems can enhance nutrition security, but also particularly those farming household require the attention of policy makers that are generally risk averse and whose economic behaviour is often egoistic.



If you would like to find out more details, please scan the QR code or click hyperlink to read the whole study of Till Ludwig.



https://www.zef.de/fileadmin/user_upload/zef_dp_247.pdf



GLOBAL FAMILY

04



“OUR THREE MOST PRESSING AREAS FOR ICT SOLUTIONS ARE FARMING ADVISORY, INPUT MANAGEMENT AND TRACEABILITY”

Interview with Kavitha, Head of the Kazhani Farmer Producer Organisation, after her GIZ training on ICT in Feldafing, Germany

As the head of her Farmer Producer Organisation (FPO), Karattadipalayam Palanisamy Kavitha from Tamil Nadu is not only in charge of managing the day-to-day operations of her business, but she also looks into introducing digital solutions to the organisation and fellow farmers. During a training in Germany, organised by the 15 Green Innovation Centres, she learned about ICT in agriculture together with the rest of the global family. The special characteristic of this format is the focus on cross-country knowledge exchange of all participants instead of the sole introduction of new contents.

Kavitha, how is the IT literacy rate of the farmers in your FPO?

More than 70 per cent of our farmers own smartphones and use their applications. Around 25-30 per cent of the farmers are also able to work with a computer.

Which ICT tools are you and the farmers of your FPO using already?

Social Media like WhatsApp and Facebook, TV, Radio and Farm-related apps for weather advisories or apps relaying commodity-rates related information across markets.

In which areas do you see a need for ICT solutions in your FPO?

In my opinion, the three most pressing areas for ICT solutions are farming advisory, input management as well as traceability. Concerning the last point, we have already started to work on the traceability of bananas after I came back from the exposure visit in Germany.

Which ideas did the seminar give you for the implementation of ICT solutions in your FPO in India?

After this visit, we explored crop traceability technologies for banana farming. We interacted with two organisations which use Blockchain technology for establishing crop traceability – so that the buyer can know the detail of inputs used, fruit care activities and packing details. These firms also help in establishing a direct link between farmers and consumers or retailers. They help us to reach the market without taking any help from middlemen or -women.

Thank you so much for answering our questions. Is there anything you would like to add?

Yes, it was a really wonderful experience with GIZ in Germany. It was great to learn about so many ways in which ICT can be used in agriculture. I am looking forward to working closely now with the Green Innovation Centre in implementing new projects in our FPO.

What impressed you the most during your training and visit in Germany?

I was especially impressed by the large farm holdings and the use of machinery and modern technologies.

What did you learn from the exchange with other participants during the exposure visit?

Because of other participants, I learned about modern data collection tools such as KoBoToolbox and Witrace.

How did you share your learnings with the farmers at home?

I conducted a Board of Directors meeting and farmers group level meetings to share my learnings and experiences effectively.

Impressions from the training on ICT in agriculture in Feldafing, Germany in December 2019



FACES OF GREEN INNOVATION CENTRE INDIA



Wendy Zavala Escobar

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Project Manager in Germany for the Green Innovation Centres in India and Mozambique

'Working with the Green Innovation Centre India is one of my favourite tasks. The variety of topics, partners and regions is so diverse and inspiring as the country itself. Seeing the impact of the innovations with the farmers – especially women farmers – convinces me every time that we are doing the right thing.'

D. Ranganatha Babu

Green Innovation Centre India, ETC Consultants India Pvt Ltd
National Expert on Tomato and ICT



'Enjoying coordinating the tomato value chain in the GIC project since 2016 in Kadur. The project has given me the opportunity to build my professional skills with national and international exposures and trainings. I am applying the knowledge in managing the Kadur team, organizing communities and facilitating the process of addressing their crop-related problems through participatory approaches. We guided the farmers to establish their own Farmer Producer Company (FPC). Now, we will be focusing on building the farmers' capacities so that they manage their FPC in a professional manner. I am confident that this FPC can be a role model for other FPCs in India.'



Gayatri Lal

MYRADA Green College, supported by Welthungerhilfe
Programme Officer

'The Green Innovation Centre is providing me with the opportunity to bring in sustainable cultivation practices to the farmers. The farmer collectives approach is helping our farmers to lower the input costs and access improved market linkages. My most interesting experience in this project so far was when a group of dairy farmers explained how small changes in their cow rearing practices led to improved milk yields.'

Padmasri Nivedita Aduri

APMAS (Mahila Abhivruddhi Society, Andhra Pradesh)
Project Coordinator



'Through our work in Gender mainstreaming in agriculture, my team and I focus on understanding and addressing the gaps in access, agency and leadership opportunities for women in agriculture and Farmer Producer Organisations. This role has demonstrated the positive impact that a well-coordinated strategy can vastly improve the livelihoods of farmer households.'



Sashi Kumar

GIZ, Green Innovation Centre India, Bangalore
Technical Expert on Renewable Energy

'Happy to be part of the Green Innovation Centre team, having over two decades of experience in the development sector. I have worked in the field of sustainable solutions in agricultural business incubation, micro-finance, and private sector engagement in rural areas. Under the project, I am keen to integrate decentralised renewable energy-based assets that bring in long-term financial and social sustainability to under-served rural populations.'

