The new potato planter is suitable for small fields – an important innovation for the farmers.

Photo: Jonathan Ziebula/GIZ

Many players, one goal – the Green Innovation Centre in India

By their very nature, value chains are multi-stakeholder systems. The Green Innovation Centre in India demonstrates how the multi-stakeholder approach can be used in potato and tomato production as a systematic tool to disseminate innovations in the Indian agriculture and food sector.

By Lukas Hanke, Julia Jung and Jonathan Ziebula

The sun is beating down on a tomato field in India. Small shrubs and palms grow along the approach street, and motorcycles are passing by. Farmers and workers, dressed in colourful dresses or in light, short-sleeved shirts and white hats, are stretching their necks to get a look at their yield. Eighty days have passed since they sowed these tomatoes. Now, they are standing in a circle to inspect their work. They are not alone – representatives from the research institute World Vegetable Centre, the local seed company Orbi Seeds and the local tomato processor SunSip have also come to see the progress of the field trials. Brought together by the Green Innovation Centre, these scientists, businessmen and farmers forming the stakeholder group have a common goal – to test and introduce tomato varieties suitable for processing in India – a formidable task (see Box next page).

Challenges such as the introduction of new crop varieties can only be tackled successfully if many different stakeholders are involved. One single player – be it research, a development agency, a private company or a farmer – might not achieve the same outcome. Moreover, inclusion of relevant stakeholders from the beginning increases the ownership of the actual solution.

Just like for processing tomatoes, the Green Innovation Centre India uses the involvement of multiple stakeholders as an effective tool to disseminate new technologies and to develop business models along horticultural value chains. Working with diverse partners can of course be both a challenge in terms of coordination and an opportunity for sustainable progress.

How is the multi-stakeholder approach being implemented in the project?

In a structured value chain analysis, the major gaps and relevant actors are identified. Based on this, value chain platforms are organised in which different actors are brought together and can come to a joint agreement on technology transfer or other forms of cooperation. Now the willingness between different actors is on paper. However, this needs to be

transferred to the field. Again, the Green Innovation Centre comes into play. It facilitates the implementation, organises exposure visits, monitors activities and collects data. At the end of the process, all stakeholders are invited to come together again and evaluate their joint effort and future steps.

Who is involved?

- **Farmers and farmer groups** – they mainly identify needs on the ground, and test and verify innovations (e.g. through participatory development trials to compare conventional farming techniques with new practices)
- **Private enterprises and "eco-preneurs"** – both are drivers of innovation and providers of technology development, and they push the commercialisation of innovations (e.g. demonstration of modern ploughs and power harrows by the German manufacturer Lemken)
- **Research institutions** – scientific backstopping and identifying innovations (e.g. provision of package of practices and seed varieties by World Vegetable Centre, International Potato Centre [CIP] or the Indian Institute of Horticulture Research)
- **Government institutions** – to upscale innovations (e.g. empanelment of innovative machinery in subsidy programmes of the Indian Ministry of Agriculture and Farmers' Welfare)
- **Training and skill building facilities** – farmers are trained to understand and use the innovations (e.g. Green Colleges, accredited schools on green trades in rural areas)

The following two cases are examples of how the Green Innovation Centre India finds solutions with various stakeholders.

Mechanising potato cultivation in Southern India

Good news – potato demand and productivity in India are both continuously increasing! Traditional potato growing areas in the states of Karnataka and Maharashtra play a crucial role for the south Indian potato market. However, the potato's path from seed to the consumer's plate is long and offers great potential for optimisation and cooperation between various stakeholders. In this example, we are looking at the mechanisation of potato cultivation.

The Green Innovation Centre India

The German Federal Ministry for Economic Cooperation and Development (BMZ) has established 15 "Green Innovation Centres for the Agriculture and Food Sector" – in 14 African countries and one in India. These centres are at the heart of the special initiative "One World – No Hunger" and are implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The Green Innovation Centres are networks of various stakeholders which are united by their common goal of realising the initiative's vision.
Smallholder farmers are in focus of the Green Innovation Centre India, which supports them in sustainably increasing their agricultural productivity and income. A second objective is to create new jobs in the agriculture and food sector. To achieve both, the project disseminates innovations along value chains based on the three crops tomato, potato and apple, working in line with priorities of the Government of India, such as 'Doubling Farmers' Income by 2022'.
The Green Innovation Centre promotes the expansion of innovations through advisory services, the organisation of training, further education and facilitating access to loans. These innovations can be of a technical nature, such as agricultural mechanisation or improved seeds, fertilisers and food cooling chains, and in many cases, they focus on new cooperation channels, such as setting up producer associations, specialised enterprises or interest groups.

1. The Green Innovation Centre brings actors together who otherwise might not necessarily cooperate.
2. The Green Innovation Centre is by default connected with actors along the whole value chains. The same applies to the government, which is seeking successful models for upscaling.
3. One of the major challenges when working in multi-stakeholder systems is building trust. Bringing everyone together is the easy part – but getting a machine manufacturer to understand a farmer's perspective on potato cultivation or making a farmer understand the economic constraints of private companies is the real challenge.
4. The Green Innovation Centre is an innovative project with no commercial interest. This enables us to support promising endeavours which would probably not be supported by regular businesses.

To ensure that the potato plant thrives well, the seed potatoes must be planted about eight centimetres deep with a spacing of 35 centimetres in loose soil. Cultivating a whole field in this way in the midday heat is exhausting and expensive due to high labour costs. But with the right machine, growing potatoes is made easy – in this case, with the semi-automatic potato planter.

Pulled by a tractor, the farmer sits on the planter, feeding the machine with seed potatoes, which are then planted in fresh rows. This helper facilitates and accelerates the work considerably, but it also increases crop yields and thus farmers' incomes. The higher ridges combined with deep ploughing and power harrowing are suitable for various soil types, improve water drainage in the field and lead to less weeding. Also, the seedlings are less susceptible to diseases and damage. As the potato planter ensures uniform growth and maturity, overall, the harvest is higher and of better quality.

Where does the multi-stakeholder approach come into play? The potato planter was developed by the Green Innovation Centre India together with farmers and the Indian company Rohit Krishi Industries Pvt. Limited, combining expert advice with the experience and needs of farmers and manufacturers. This type of multi-stakeholder collaboration allows farmers to point out the shortcomings of previous machines. The private sector partner was able to adapt the potato planter to farmers' requirements – for smaller fields and limited tractor power. Additionally, at a price of around 1,000 euros, the machine is more affordable, even for individual farmers.

To complete the multi-stakeholder picture, the application for testing and certification has been submitted to the government. After approval, the planter will be available to the farmers at a subsidised price through the Ministry of Agriculture and Farmers' Welfare. Thereby, individual or group ownership as well as rental services by external companies are possible options. In the meantime, the Green Innovation Centre India is training farmers on the use of the planter.

The case of processing tomatoes

India is one of the biggest tomato producers world-wide, second only to China. However, with a lack of processing varieties and economically viable production systems in India, processed products like tomato paste are rarely

manufactured and can hardly compete with cheap imports from China. Accordingly, Indian tomato farmers focus on the cultivation of fresh table varieties, which leads to another problem – the pig cycle. Whenever prices are high and weather conditions are good, farmers across India start producing tomatoes. Soon, this leads to oversupply, and prices drop. Low prices let farmers lose their interest in growing tomatoes, causing them to stop production. As less and less tomatoes are produced, prices rise again, and the cycle starts from the beginning. These fluctuations lead to unpredictable prices and income.

The Indian government is working on overcoming this trap, and the Green Innovation Centre India has identified a possible first step together with several actors: to diversify tomato varieties and to not only produce for fresh market consumption, but also for processing. The strategy is as follows: if Indian farmers can produce tomatoes for processing at an affordable price for processors, they can become independent from the volatile prices for fresh table tomatoes and are thus able to stabilise their income. As less farmers would contribute to fresh market tomatoes, prices would automatically fluctuate less as well.

The Green Innovation Centre India is testing these steps with multiple stakeholders. On the one hand, field trials with seed companies, research institutes and farmers are set up. This enables the best variety and the best cultivation practices to be determined. On the other hand, farmers are linked with local processors.

The project initiated various research and production trials of processing varieties. In the last season from October to March, the World Vegetable Center carried out research trials in collaboration with the Indian seed companies I&B Seeds and Seed Works. Additionally, the project supported large scale production trials involving about 25 farmers in association with the seed company Orbi. The trials aim to identify which variety combined with which farming practices results in the highest yields and best quality for processing at the lowest production cost.

Right from the start, the Indian company SunSip Agro Processor was involved in assessing the suitability of the produce for processing. However, the main challenge is the production costs, as VD Sarma, Executive Director of SunSip explains: "We can buy tomatoes at a maximum of 4.5 Rupees (Rs)/kg. This means that production costs of farmers cannot exceed 3 Rs/kg." If Indian farmers cannot reach this level, processors will fall back on the cheaper Chinese produce. SunSip Chairman Murali Krishna says: "We have been in the market since 1994. Chinese competition started in 2000. Now, the Green Innovation Centre is helping us and Indian farmers bridge this gap." Among the stakeholders involved, it was agreed that farmers use a part of their land to grow a tomato variety suitable for processing. The processors promise to buy it at a fixed price of 4.5 Rs/kg. This gives security to both, farmers and processors (see article on page 13). Correspondingly, a major task of the Green Innovation Centre was not only to provide technical support, but to build trust between farmers and SunSip. The project enabled farmers to visit the processing plant and organised field days to demonstrate the crop to private partners.

The next steps for the Green Innovation Centre India are to conduct more trials and to better understand the potentials of the seed varieties under different conditions. The Horticulture Advisor of the Green Innovation Centre Dhananjaya BN is convinced that "only with the best varieties and cultivation practices can we help farmers to lower their production costs and get their produce sold".

Summing up...

Both examples show that the cooperation of many different stakeholders can be rewarding and profitable for everyone. Farmers increase their productivity and income; the private sector increases its turnover and creates jobs, research institutes test their hypotheses on the ground and the state experiences economic growth. The role of the Green Innovation Centre India is to facilitate between the actors and to support the piloting of promising endeavours whose economic viability has sometimes not been proven yet.

As the focus of the Green Innovation Centre is to implement sustainable innovations, the work of the past years is sought to be integrated firmly and permanently into the agriculture and food system, even after the end of the project.

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The planter saves time for planting compared to manual labour and is more affordable for farmers than conventional machines.

Photo: Jonathan Ziebula/GIZ

Representatives of farmers, research and processors measuring the parameters of the new tomato variety.

Photo: Monika Austaller/GIZ

After harvest, the group check the quality of the tomato variety's pulp for processing.

Photo: Monika Austaller/GIZ