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RESEARCH ARTICLE

Small-scale Farmer Innovation for Sustainable Agriculture

Building on Indigenous Knowledge to Move towards Farmer-led Joint Research

By Chesha Wettasinha

Introduction

Small-scale farmers are crucial to attaining global food and nutrition security and maintaining agrobiodiversity. According to FAO, small-scale farmers contribute 50-70 per cent of total global food supply. Over 90 per cent of the world's 570 million farms are classified as 'small scale', with at least 75 per cent of the farms in the developing world being less than a hectare in size (FAO 2014).

The Global Report on Agriculture (IAASTD, 2008) revealed that small-scale farming makes a huge contribution to the global agricultural economy. Not only is it the livelihood basis of millions of families; it also generates many additional jobs within local economies, often in the informal sector. It is also a repository of immense local knowledge and experimental capacity to generate and continue to develop context-appropriate forms of agriculture and food production with relatively little capital.

These small-scale farmers and other land-users are being confronted with rapid changes as they try to maintain and improve their livelihoods. Globalization brings both opportunities and challenges. Increased competition for their products and degradation of their natural basic resources threaten the sustainability of their efforts. Climate change is posing even more challenges and putting some of their age-old, indigenous farming practices into question.

But small-scale farmers are persistent innovators in adapting to changing conditions. Women and men, individually and collectively, are finding new and better ways of doing things, using their own resources, on their own initiative and without direct support from external service providers. Such a process enables them to deal with change as they see it happens, and thereby to become more resilient (PROLINNOVA, 2016).

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Local innovation – dynamics of indigenous knowledge

Agricultural research and development (ARD) is driven by innovation at all levels, but the type of innovation that ultimately makes the difference is **what farmers decide to do**. Normally, the term 'innovation' at farmers' level has been used to refer to farmers' adoption of new technologies coming from outside. Until recently, little attention was given to the new technologies, management practices and institutions that farmers and farming communities have developed themselves – to 'local innovation'. This refers to the **dynamics of indigenous knowledge** – the knowledge that has developed over time within a social group learning from the experience of earlier generations and knowledge that has been accumulated meanwhile and has been fully incorporated within local ways of thinking and doing. Local innovation in agriculture and natural resource management (NRM) is the **process** through which individuals or groups within a given locality discover or develop and apply improved ways of managing the available resources – building on and expanding the boundaries of their indigenous knowledge (Waters-Bayer *et al.,* 2008).

Local innovations are not only technical in nature but include socio-economic and institutional innovations such as new ways of gaining access to resource-use rights or new ways of organizing marketing activities. For example, after a road has been built or improved and vehicles are moving along it, groups of women organize themselves to sell their dairy products at more distant and lucrative markets and find innovative ways to do this at low cost per unit of dairy product sold (Waters-Bayer *et al.,* 2008).

PROLINNOVA – an international network to promote local innovation

PROLINNOVA (Promoting local innovation in ecologically oriented agriculture and NRM) is an international multi-stakeholder network of organizations and individuals of diverse institutional affiliation that recognize the innovative capacity of small-scale farmers as key to sustainable development. PROLINNOVA's vision is a world in which women and men farmers play decisive roles in agriculture and NRM innovation processes for sustainable livelihoods. Thus, it stimulates a culture of mutual learning and synergy among diverse stakeholder groups to actively support and promote local innovation processes in agriculture and NRM.

The network consists of country platforms in Asia, Africa and Latin America. In Asia, PROLINNOVA is active in Cambodia, the Philippines and Nepal as country platforms (Cps), while individuals in many more countries join the network. In each country, a multi-stakeholder National Steering Committee provides oversight and guidance to the CPs and helps mobilize resources. A small international support team supports the activities at national level through coordination, capacity strengthening, policy influencing, information management, publication and networking. The PROLINNOVA Oversight Group serves as the governance mechanism for the whole network.

Farmer-led innovation and joint experimentation

PROLINNOVA partners deliberately try to capture and enhance the creative energy that exists to a greater or lesser extent in all rural communities but is overlooked by most people and projects that try to intervene in local development processes. Participatory innovation development (PID) is a process of joint research, in which scientists and development practitioners join hands with small-scale farmers to further develop, test and adapt local ideas and initiatives, combining scientific and local knowledge.

PID is aimed primarily at strengthening the capacities of rural people and local ARD services to collaborate in developing site-appropriate improvements. Facilitating discussion by the farming community and ARD service providers such as extensionists and scientists about the local innovations, their strengths and weaknesses, the opportunities or problems they address, leads into joint proposals and agreements about research to be conducted. This can include further research by individuals and groups of farmers in the villages with and without the support of extension agents, joint on-farm research by farmers and scientists, and work by scientists on research stations or in laboratories to answer questions raised by experimenting farmers.

PID brings experiences, knowledge and action together in a way that generates new solutions – as well as the ability to continue doing so. In the process, the insights and perceptions of all involved – farmers, scientists, extension staff, others – are treated equally and, where they seem to contradict, informed choices are made jointly on the most feasible innovation pathways. Involvement of field extensionists in the process creates openings at local level for sharing results through the rural advisory system. Involving community members in assessing research results and sharing findings encourages farmer-to-farmer extension.

FROM THE EDITOR

Dear Palawija Forum readers,

Greeting from CAPSA, we are delightful to present our Palawija Forum, December 2016 edition. In this edition, we share how local/indigenous knowledge lays the ground for agricultural innovation. Rooted in diverse cultural practices, the dynamic of local knowledge generates 'local innovations' that go beyond technologies and encompasses social aspects and institutions. Reij (2001) says that farmers' capacity to innovate is the crucial component of success for local innovation.

Indigenous knowledge-based innovation in agriculture has proven to be a promising adaptation strategy in coping the changing environment, including climate change. Hence promoting local innovation is an alternative approach to sustainable agricultural development.

This edition delineates how the small-scale farmers in Chitwan, Nepal and East Java, Indonesia, embody community persistence of struggle and creativity which have shaped their resilience in overcoming constantly changing environments and with limited available resources.

However, methodologies to stimulate farmer-led innovations are far from the mainstreams. Written by Chesha Wettasinha of PROLINNOVA, the article on *Small-scale farmer innovation for sustainable agriculture* discusses the importance and advantages of participatory innovation development (PID) as a method to combine scientific and indigenous knowledge in developing site-appropriate improvements in a more participatory research and equal development process.

Tapping into local knowledge, the East Java farmers developed the *Dampit* cropping pattern as an innovative farming pattern, which has proven to be relatively resistant to exposure of extreme weather changes. The article written by Edi Dwi Cahyono, Dimas Kukuh, and Tatag Wahyu Jatmiko, of Brawijaya University, Malang, describes the method, advantages and implications of *Dampit* to higher production of maize.

The need to assist indigenous shifting cultivators is highlighted by the FAO case study on *Shifting cultivation livelihood and food security* (2015). This study which was carried out in seven South Asian countries, recommends that such supports will be best provided through a spirit of collaboration and constructive engagement of all relevant stakeholders prior consultations with indigenous communities.

To comprehend this edition, we share a success story on *Bungaroo*, a simple and innovative technology which can truly transform the lives of people. Led by a woman, the local innovation has facilitated more than 14,000 farmers and transformed 40,000 acres of barren, disaster-affected or highly saline land into productive farms in arid rural Gujarat, India.

We hope that readers find all this information useful, and we welcome your feedback and contributions to future issues of this newsletter.

Editor

Local innovation to reduce fodder wastage and women's labour in Nepal

Uttam is a farmer from Sissai village in Chitwan, Nepal. His family keeps sheep, goats and buffaloes. In the wet season, the animals are kept and fed indoors. Uttam's wife and daughters collect the fodder but a lot is trampled by the animals. Uttam wanted to find a way to reduce such wastage of fodder and to reduce the work of the women in collecting it. Being also a fisherman, he used fishnet to make a bag for the fodder (jhalkari) that he hung in the stall for the animals to eat from. This innovation was identified by PROLINNOVA Nepal partners, who worked together with Uttam to improve its design through joint experimentation. They made different shapes of the opening to make refilling the bag easier. The women gave feedback on each of the designs. Finally, after a few rounds of experimentation, Uttam settled for a light iron ring as an opening to the fodder bag, which could easily be suspended, emptied and refilled. This simple yet useful innovation was taken over by many farmers in his village, who have continued to adapt and improve it.

Uttam describing how he developed the jhalkari
Photo: Ecoscenter, Chitwan,Nepal

ARD stakeholders can encourage farmer-led research in several ways:

- **Creating opportunities for farmers to share their innovations**, as these provide ideas for other farmers to try out
- **Offering alternatives** to compare with current practices or local innovations
- **Improving farmers' experimental design:** stimulating farmers to examine their informal experimentation methods and helping them explore more systematic forms of experimentation
- **Filling local knowledge gaps:** increasing farmers' awareness of resource management principles and providing information on phenomena that farmers cannot observe on their own, so that farmers can develop local ways of applying the principles in farming practice
- **Facilitating mutual learning:** creating opportunities for groups of farmers to analyse critically both local and external ideas for improving agriculture and NRM, and to assess the results of farmer-led participatory research, e.g. through farmer learning groups or exchange visits.

Local innovation funds to support PID

ARD funds to support such joint research based on local innovation are often inexistent. PROLINNOVA partners have pioneered Local Innovation Support Funds (LISF) for this purpose. LISF are financial resources co-managed by communities and used exclusively for supporting small-scale farmers and other land-users to engage in PID. LISF are used for buying materials for

Table 1. Trends in volume and use of LISF by farmer innovators

Average period covered	Average size of grant (Euro)	Range in size of grants (Euro)	Use of funds
4 years	72	5-1 670	▪ Farmers' own experimentation ▪ Farmer-led joint research with other ARD stakeholders ▪ Learning and sharing visits

experimentation, hiring in external resource persons, undertaking study visits to support the local research and enabling exchange in other ways.

Action research undertaken by PROLINNOVA in several CPs, including Nepal and Cambodia, has shown that relatively small amounts of funding managed at community level play an important role in accelerating local innovation processes. Three central principles of LISF drawn from this action research are: direct accessibility to farmer innovators and not to development agencies working with them; use of funds for innovation, experimentation and learning by farmers; and decision-making on the use of the funds stays in the hands of the farming community.

As shown in Table 1, LISF grants are relatively small. However, they are significant in the hands of small-scale farmers who use them to further innovation. Smaller grants were used to buy tools or inputs (such as seed) for simple experiments by farmers themselves. Larger grants were given to farmers who were involved in more complex, capital-intensive innovations or joint research which required external services such as soil testing, hiring external services, etc.

LISF could be embedded into existing research and extension programmes, thereby enabling more farmers to be engaged in innovation. Building a LISF component into regular national ARD structures could be one sustainable option. Setting up a national farmer innovation fund could be another (PROLINNOVA, 2012).

Strengthening community resilience

To be prepared for the unknown, communities need strong social capital or networks of people, including community-controlled linkages with people outside the community, so that community members can share, learn and innovate continuously. Practising innovation is like developing muscles and constantly exercising them so that there is local strength to deal with a broad range of unpredictable forces.

Facilitating a participatory approach to developing local innovations in agriculture and NRM can strengthen the adaptive capacities of farmers and communities to deal with change. Local people involved become more proactive and are better able to analyse their situation and the changes affecting them, including those with a longer-time horizon. They are encouraged to collaborate and combine energies and knowledge, to experiment systematically with alternative options and to become better linked to other actors with whom they can continue to design and implement adaptive action to address newly emerging problems. They thus become more resilient to shocks and stresses in a constantly changing environment (PROLINNOVA, 2008 & 2016).

Integrating LI/PID approaches into mainstream ARD

Agricultural research and development (ARD) agencies are now becoming increasingly aware of the importance of enhancing capacity of small-scale farmers and their communities to innovate (e.g. FAO, 2014, Leeuwis *et al.*, 2014) and thus become better able to adapt to new conditions, problems and opportunities – in other words, to become more resilient.

However, an approach that puts small-scale farmers in the driving seat requires transformative change in the policies and structures of ARD agencies. Stimulating scientists and rural advisors to join farmers' research calls for changes in job descriptions, research-approval procedures and performance appraisal and rewarding.
Being in the supportive role in farmer-led experimentation is an unaccustomed role for

scientists and rural advisors, who would need to shift from a position of control to one of facilitation. Such a shift of changes in behaviour and attitudes calls for iterative training and mentoring over longer periods of time (Prolinnova, 2010).

ARD managers need to make space for collaborative work with multiple actors, including small-scale farmers. Research funding as mentioned above needs to incorporate mechanisms for funding farmer-led experimentation. Institutes of agricultural higher education would have to incorporate methods of experiential and participatory learning that create spaces for interaction between farmer innovators and students. Staff of these institutions would be required to transform curricula to prepare ARD professionals who have the skills, knowledge and attitudes to engage with farmers as equal partners.

Conclusion

Promoting local innovation is an approach to sustainable agricultural development that goes beyond technologies and encompasses social aspects and institutions. Recognizing local creativity serves as a point of entry into building partnerships for joint experimentation which, in turn, triggers internal reflection and institutional change at higher levels. In this way, some space – however small – can be created to allow multi-actor learning processes and, thus, innovation to happen from the grassroots upwards.

Content for this article is drawn from many Prolinnova publications, not all referred to below, but to be found at www.prolinnova.net

(List of references can be made available upon request)

SHORT ARTICLE

Dampit Cropping Pattern

East Java Farmer-led Innovation to Respond to Climate Change

Edi Dwi Cahyono, Dimas Kukuh, and Tatag Wahyu Jatmiko

Introduction

Climate change, manifested in prolonged drought in the dry season and the excess water in the rainy season, have a significant impacts on the sustainability of agriculture. The key question is how is the response of farmers to face these challenges within the limitations of their resources? This article is to describe the adaptation of farmers in East Java to weather uncertainty. Data were gathered through a preliminary study conducted in a village in lowland dry land farming areas in Tulungagung Regency, East Java where the majority of farmers grow rice and maize. The type of research is qualitative and data were gathered from local key farmers. There are indications that the farmers create cultivation and cropping pattern innovations as a form of local adaptation to the natural challenges. These alternative ways of planting are not only able to increase resistance to drought and pest attacks, but also relatively more productive.

Impact of climate change on agriculture

Climate change, as indicated by the increase in the amount of Carbon Dioxide (CO2) and Ozone (O3), is estimated to impact the agricultural productivity in many regions of the world (Lobell & Gourdji, 2012). The impacts of climate change depend on the crop type, and vary between altitudes; agricultural production is likely to rise in the high and middle lands, and to decline in the lowlands (Parry *et al.*, 1999). The common assessed crops are rice, maize, soybeans and wheat because of their significant source for human food and livestock (Lobell & Gourdji, 2012). The impact assessment is useful to determine the priority of the cultivation of commodity strategy, as well as to study the adaptation of farmers.

Taking into account the lately high occurrence of anomalous weather, South Asia as the region through which the monsoon winds pass, is vulnerable to food security (Turner & Annamalai, 2012), this is also a case in South-East Asia. It is predicted that climate change could reduce agricultural production by 1.5 per cent per decade if not accompanied by an effective adaptation strategy (Lobell & Gourdji, 2012).

Impact of climate change on farmers

The preliminary results of a recent survey (APIK, 2016) in the central region of East Java provide the indication of climate change. Twenty one per cent farmers who grow a variety of crops reported that there has been a rise in temperature; 18 per cent change in cropping calendar; 16 per cent change in weather; 16 per cent change in rainfall; 15 per cent shorter dry season; and 12 per cent longer rainy season. The rest mentioned of extreme weather (APIK, 2016). These results warn the potential problems that may arise in the process of crop cultivation. Research shows that some types of plants, especially fruits, are sensitive to rising temperatures and it might reduce the production (Fiebig-Restless *et al.*, 2012). Increasing temperatures may boost crop pests and diseases, particularly insects (Vargas & Rodríguez, 2008). This survey reveals also that unpredictable seasons have an association with a decrease in the quantity and quality of crop production (41 per cent); an increase in pests and diseases (30 per cent); an increase in crop failure (19 per cent); and even a decrease in water resources (4 per cent) (APIK, 2016).

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Farmer-led innovation to adapt to climate change

Farmers in developing countries have various cultivation adaptations to deal with climate change. Some authors have documented the adaptation strategies: intensification, diversification and expansion of land (Adger *et al.*, 2003). Other farmers are changing cropping calendars and watering time, using climate resistant cultivars, rotating with other crops (Downing, 1992); practising homogeneous or polyculture planting system, using germ plasma wild, applying mulch (Makadho, 1996), and some even planting annual crops (Thomas, 2007).

East Java farmer-led innovation: The 'dampit' cropping pattern

In Tulungagung Regency of East Java province, farmers usually grow rice during the rainy season, and plant maize in the dry season. However, the extreme weather, particularly the prolonged drought, has threatened maize production. In the past, farmers plant three times in a year, i.e. rice one time (wet season) and maize two times (dry season). In order to reduce the risks, local farmers have an initiative to increase the frequency of cropping by growing rice one time and maize three times. To support this increase, farmers initiate a cultivation strategy known locally as *dampit*, literally means 'twin'.

Dampit pattern of maize planting

Dampit is a unique pattern of maize planting, in which maize is planted in sequent between planting cycle without a pause. In other words, before the end of the first maize cycle, new maize seeds are inserted. During harvest of the first cycle, maize cobs are plucked, but the wrapper leaves are left to shade the subsequent young maize crops. After several days, the top of the first maize crops were cut off to let the later ones getting enough sunlight. The plant stems are left out to shade the subsequent maize crops. Later, the stems are cut, but farmers let the tuber left in the soil. The maize stems are disposed on land to decay. Likewise, all of this process applies to the third maize cycle.

In addition, in the *dampit* system, row spacing for maize plants is narrow (*dempet*). Seeds are planted 20 cm within and 40 cm across rows (compared with 40 cm within and another 40 cm across rows for the conventional pattern). It is worth noting that in the first cycle, the maize crops are planted among the tuber of rice plants which left over in the soil during the harvest. Farmers claim that this new cultivation system is more resistant to drought.

Furthermore, tillage is only administered once, which is in the event of crop rotation from maize to rice. For the cultivation of maize, farmers do not apply tillage (i.e. zero tillage). This technique is applied to maize planting cycle thereafter, namely the second and third. Straw from the previous rice harvest is embedded into the ground to increase biomass and reduce weed growth. However, there are some other farmers who burn it with the belief that it can sterilize the soil from diseases carried by rice plants. Furthermore, for reasons of practicality, farmers do not establish maize seedbeds. Technically, the maize seeds are planted directly between the former piles of rice straw, which serve as a basis for plant spacing.

It is reported that with the *dampit* pattern, grass growth can be controlled because weeds are not able to compete with the maize plants because of the density. In the next cycle, the maize crop that has not been harvested will act as a shelter for young maize crops while also serving as windbreaks. The local farmers are used to using hybrid maize seeds as a substitute for conventional ones. A local agricultural official reported that hybrid seeds are more resistant to changes in weather, disease resistance, high yield levels, rapid harvest, and the seed prices are affordable.

Another form of adaptation employed by the farmers is that instead of conducting transplanting process, they practising direct planting. For this purpose, the farmers add organic fertilizer in addition to chemical fertilizers, which is inserted in the holes of the seed planting to reduce mortality, especially during prolonged drought. They use water wells using diesel-fueled pumps, which are often modified by the LPG to save fuel. Erratic weather is also causing an increase in attacks of downy mildew disease in maize. Farmers believe that the attack was caused by various factors, such as delay of irrigation, excessive use of urea, the absence of organic fertilizer when planting seeds, and the weather chaos. Some farmers provide seed fungicide to prevent downy mildew.

The advantage of *dampit* cropping pattern as reported by farmers

- The remaining of fertilization in the first maize cropping cycle can still be used for the next one.
- Farmers do not need to embroider plants which are failing to grow. The *dampit* pattern allows a relatively larger number of plants per unit area, though it only applies one seed for every plant hole (the conventional way requires two seeds).
- The new patterns can negate land weeding. Weeds are difficult to grow because of competition with the main crops. One contact farmer describes the situation: *"That is the advantage of dampit ... weeds will no longer live because there is a shade of the fast and dense growing maize.*"
- Maize products per cropping cycle and overall for the *dampit* are higher than the conventional ones. Farmers claim that, under the *dampit* system, the productivity of maize for per 100 *Ru* (700 *Ru* equal to 1 hectare) are 1.6 tons (the first cycle), 1.4 tons (the second cycle), and 1.3 tons (the third cycle) of dry seeds (or 11.2, 9.8, and 9.1 tons per hectare, respectively). The conventional one is only able to produce an average of 7 tons/ha for each cropping cycle. By adding one cycle (third one), the total production of the *dampit* would even much higher.

Implication

This East Java farmer case is essential because under the resource constraint, the small-scale farmers in the lowland areas that are sensitive to climate exposure are able to develop an adaptation strategy by applying an innovative farming pattern so called *dampit*. The adaptation varies, from new arrangement of cropping pattern; plant spacing and population; use of the adaptive weather cultivar; up to the production process, such as in the process of land preparation, management of seed and planting, and plant maintenance, as also found elsewhere in the world (Downing, 1992). Moreover, the Javanese farmers innovate by increasing the planting frequency using a relatively complex cultivation engineering system. This indicates of their resilience in overcoming the natural challenges.

The *dampit* innovation is relatively resistant to exposure of extreme weather, let alone the drought. It is worth noting, as it is claimed by the farmers, the production under the *dampit* pattern is relatively much higher than the conventional one. This is consistent with another study revealing that appropriate adaptation to climate change may increase the production and income of farmers (Festiani, 2011). Therefore, it is necessary to validate the farmers' adaptation strategies, since this article is based on a preliminary study. This farmer-led innovation is a form of local participation, which may contribute to any other adaptive strategies undertaken by farmers around the world.

Lastly, we have not examined how the *dampit* innovation is spread among farmers, which may be accomplished with limited help from outsiders. Therefore, an assessment of the communication process, especially the information exchange mechanism among farmers, is necessary to understand the diffusion process of the *dampit* innovation.

(List of references can be made available upon request)

SUCCESS STORY

Bhungroo, a Reservoir of Hope for Poverty Alleviation, Crop Failure and Woman Empowerment in Gujarat, India

By Kavita Kanan Chandra

In Mehsana, district of Gujarat, farmers were not allowed to draw underground water, yet a water park with 1.5 lakh bore wells depleted ground water, pushing the level from 200 feet to 1,200 feet in just ten years. The small farmers could not survive in this scenario.

Hit by ground realities of farming in arid rural, Biplab Ketan Paul has successfully harnessed the precious natural commodity through an innovative process named *'Bhungroo'*, which uses pipes to filter and store rainwater in underground reservoirs with capacities to hold as much as 40 million litres of water in it.

A single *Bhungroo* – the Gujarati word for a hollow pipe – unit harvests water for only about 10 days a year, but supplies water for as long as seven months and ensures food security for five families by irrigating two crops in two seasons for at least 25 years. Besides, this non-saline rainwater reduces the salinity of groundwater, making it fit for agricultural use.

The first *Bhungroo* units were installed in five villages in Patan district of Gujarat in 2002 in nine months at nearly Rs.7 lakhs each. The current Bhungroo units come in 17 designs and their prices range from Rs.4 to 22 lakhs, based upon 29 variables such as rainfall and subsoil.

Installation of the unit takes a mere three days. Each *Bhungroo* unit caters to the irrigation need of 15 acres of land, making that much land productive twice a year. A one-time investment of Rs.8 to 9 lakh in *Bhungroo* can generate an income of Rs.3 lakh per annum and the investor breaks even after 36 months. It increases a farmer's agricultural income illustratively from Rs. 11,000 a year to a minimum of Rs. 34,000 in three months.

In 2007, Biplab conceptualized the social enterprise Naireeta Services Private Limited, promoting a social business model that ensures women empowerment, as each unit has to be owned and managed by women from small and marginal farmer families. Currently, there are seven in the team, along with 17 women farmer volunteers and eight members on an on-call basis.

The Women Self Help Groups of a village identify the below-poverty- line women members. A group of five women then agrees to their roles in the group and the costs of maintenance. One of them gives a part of her land for construction of the *Bhungroo* while the other members contribute labour, bringing an added sense of teamwork. This innovative and path-breaking water-harvesting community initiative has not empowered woman.

With several awards and honours such as the Ashoka Globaliser Award for Innovation in 2012 and 2014, Biplab has received grants, awards and accreditations from organizations such as the World Bank, the Commonwealth, the United Nations Framework Convention on Climate Change, and the Asian Development Bank.

Bhungroo technology has been replicated widely in Gujarat, Karnataka, Bihar, Jharkhand, West Bengal and Odisha. Internationally, *Bhungroo* has crossed over to Africa (Ghana, Liberia, Kenya), EU countries, Bangladesh, Cambodia and Viet Nam. This woman led local innovation has facilitated more than 14,000 farmers and transformed 40,000 acres of barren, disaster-affected or highly saline land into productive farms in arid rural as well.

Biplab has made *Bhungroo* not only a reservoir of water, but a reservoir of hope for poverty alleviation and women empowerment, besides addressing seminal problems such as crop failure.

Source:
http://www.theweekendleader.com/Innovation/2396/watershed-innovation.html

Policy Analysis Workshop

Transition towards Sustainable Agriculture in the Context of the 2030 Agenda for Sustainable Development – Strategic Implementation, Follow up and Review

CAPSA-SIAP Policy Analysis Workshop was held from 15-17 November 2016 in Bogor, Indonesia, and attended by 33 participants including representatives from 14 countries, CSOs, research institute, universities and UN organizations. The workshop reviewed the preparedness and approaches of the member states for implementation of 2030 Agenda and SDG, as well as for measuring policy effectiveness and progress in implementation. The participants also reviewed a variety of innovative policy options for accelerating transitions to sustainable agriculture, and discussed how such polices impact people, the environment, social and political institutions and contribute to the attainment of many of SD goals and targets beyond SDG#2.

In addition to enhancing the participants' capacity to engage in formulation, implementation and monitoring of progress in sustainable agriculture policies, the workshop adopted a series of recommendations on strategic approach to strengthening regional and national capacities to facilitate effective transition towards sustainable agriculture. The report will be disseminated shortly.

Multi-stakeholder Dialogue on 'Scaling-up Interventions for Sustainable Agricultural Development in Myanmar's Dry Zone'

Two day Multi-stakeholder Dialogue has been conducted on 20-21 December 2016 in Nay Pyi Taw under the CAPSA-led LIFT project in Myanmar. The event organized by CAPSA in collaboration with the Asian and Pacific Centre for Transfer of Technology (APCTT), Centre for Sustainable Agricultural Mechanization (CSAM) and Network Activities Group (NAG - national partner NGO) in collaboration with the Department of Rural Development (DRD) of the Ministry of Agriculture, Livestock and Irrigation (MoALI) of Myanmar.

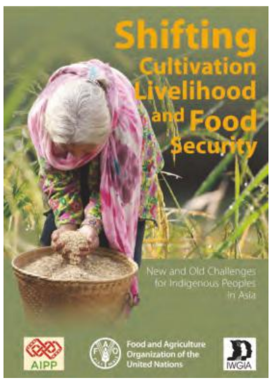
Two ministers from Provincial Governments, more than 50 senior and mid-level participants representing union and regional government, universities, international and local NGOs, community-based organizations, multilateral and bilateral organizations, private sector and farmer associations took part in the meeting and discussed on collaborative actions and roadmaps for scaling up sustainable agricultural development policies, practices and technological interventions, including for enhancing climate-resilience. The recommendations will shortly be compiled and disseminated among relevant stakeholders.

PUBLICATION INFO

Shifting Cultivation, Livelihood and Food Security

New and Old challenges for Indigenous Peoples in Asia

Food and Agriculture Organization of the United Nations, International Work Group for Indigenous Affairs, and Asia Indigenous Peoples Pact
April 2015



The United Nations Declaration on the Rights of Indigenous Peoples was adopted by the UN General Assembly on 13 September 2007, which was drafted with the active participation of indigenous peoples. Since then, the importance of the role that indigenous peoples play in economic, social and environmental conservation through traditional sustainable agricultural practices has been gradually recognized.

Consistent with the mandate to eradicate hunger, poverty and malnutrition – and based on the due respect for universal human rights – in August 2010, the Food and Agriculture Organization of the United Nations adopted a policy on indigenous and tribal peoples in order to ensure the relevance of its efforts to respect, include, and promote indigenous people's related issues in its general work.

This publication is an outcome of a regional consultation held in Bangkok, Thailand in November 2013. It documents seven case studies which were conducted in Bangladesh, Cambodia, India, Indonesia, the Lao People's Democratic Republic, Nepal and Thailand to take stock of the changes in livelihood and food security among indigenous shifting cultivation communities in South and South-East Asia against the backdrop of the rapid socioeconomic transformations currently engulfing the region.

The case studies, although set in different social, economic, political and environmental contexts of the seven countries (Bangladesh, Cambodia, India, Indonesia, Lao People's Democratic Republic, Nepal and Thailand), highlight that shifting cultivation continues to be an important livelihood system for the indigenous communities studied (except for the Tharu in Nepal who were forced to discontinue the practice after being resettled outside their ancestral land in a national park).

The studies illustrate how shifting cultivation was and still remains a suitable and for some communities indispensible form of land use in upland areas in Asia, and that it can continue to be managed sustainably from the viewpoints of both natural resource management and household food security under conditions of sufficient and legally recognized access to land. Each study is rich with descriptions of indigenous peoples' knowledge on land use and natural resource management, customary institutions governing access and use of land and resources, collective action and other aspects of the social and cultural heritage linked to the time-honored farming system.

Source: http://www.fao.org/documents/card/en/c/8a0ee1bf-0285-45fb-bf66-fd9f1f518f60/2016.html

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