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LEIS INDIA



Stakeholders in agroecology



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*Kolar farmers, during their field visit, observe ragi crop
which can withstand drought conditions.
(Photo: AME Foundation)*

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LEISA India is a member of the global AgriCultures
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Dear Readers

Diverse stakeholders' working together has been always a challenge – especially when the mandates are inherently different. Self imposed boundaries and hierarchies stifle collective action. However, all these challenges dissolve when the purpose becomes bigger than the position.

Agroecological knowledge is context, ability and opportunity specific. Marriage of knowledge systems – informal and formal, recognition for grass root innovation and creating an atmosphere for it to happen, is the basis for the agroecological movement. Enabling environment and appropriate support is needed which requires different sensitivity, respect and working arrangements. Diverse stakeholders do play a positive role, when they are determined to. In this issue, we share some experiences which throw light on the immense potential of working together for a common purpose.

We are extremely grateful to the overwhelming response we are receiving to our survey. Every day, we take pride in receiving your focused responses, words of encouragement and suggestions for improvement. It is deeply touching when each one of you take time to cite specific instances when LEISA India content supported you. We thank all those who inspired you for sharing their experiences. Again, it reinforces the common vision we all share for a healthy and profitable farmer, healthy environment for all. Wishing you a Happy New Year!

The Editors

LEISA is about Low-External-Input and Sustainable Agriculture. It is about the technical and social options open to farmers who seek to improve productivity and income in an ecologically sound way. LEISA is about the optimal use of local resources and natural processes and, if necessary, the safe and efficient use of external inputs. It is about the empowerment of male and female farmers and the communities who seek to build their future on the bases of their own knowledge, skills, values, culture and institutions. LEISA is also about participatory methodologies to strengthen the capacity of farmers and other actors, to improve agriculture and adapt it to changing needs and conditions. LEISA seeks to combine indigenous and scientific knowledge and to influence policy formulation to create a conducive environment for its further development. LEISA is a concept, an approach and a political message.

ILEIA – the centre for learning on sustainable agriculture is a member of AgriCultures Network which shares knowledge and provides information on small-scale family farming and agroecology. (www.theagriculturesnetwork.org). The network, with members from all over the world - Brazil, China, India, the Netherlands, Peru and Senegal, produces six regional magazines and one global magazine. In addition, is involved in various processes to promote family farming and agroecology. The ILEIA office in The Netherlands functions as the secretariat of the network.

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AME Foundation promotes sustainable livelihoods through combining indigenous knowledge and innovative technologies for Low-External-Input natural resource management. Towards this objective, AME Foundation works with small and marginal farmers in the Deccan Plateau region by generating farming alternatives, enriching the knowledge base, training, linking development agencies and sharing experience.

AMEF is working closely with interested groups of farmers in clusters of villages, to enable them to generate and adopt alternative farming practices. These locations with enhanced visibility are utilised as learning situations for practitioners and promoters of eco-farming systems, which includes NGOs and NGO networks. www.amefound.org

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6 Stakeholders in SRI innovation systems

Suchiradipta Bhattacharjee and Saravanan Raj

In the small North East Indian state of Tripura, System of Rice Intensification (SRI) has grown to develop into an innovation system where various stakeholders have come together to make the state self-sufficient in rice production. The lessons learnt from the SRI innovation systems in Tripura, if applied to similar crops and contexts would definitely prove to be a model for development and prosperity.

10 A perspective on the working of multistakeholder processes

K V S Prasad

While multi stakeholder processes is desirable for promotion of agro ecology on a wider scale, in practice, it is not as simple as it is thought to be. AME Foundation's experience in fostering such processes shows that the success depends on several factors. In fact, adhering to certain basic principles is necessary to keep the process going.

15 Enhancing the power of negotiation of small farmers

Debaranjan Pujahari and Aarti Dayal

Non profits like Technoserve, through partnerships, are contributing towards empowering small farmers by connecting them to information and market opportunities. Through their initiative, small farmers in Bihar, as members of farmer producer groups, realised the power of negotiation through collective marketing.



25 Joining hands to revive pastoral economy and its ecosystem

Ramesh Bhatti and Shouryamoy Das

A host of organizations have come together in helping the pastoralist community groups conserve the local buffalo breed and the ecosystem. The partnerships helped communities in gaining access to dairy markets that are remunerative. Now, they are also with the communities in ensuring them gain governance rights. The government, the major stakeholder, is yet to listen to them.



CONTENTS

Vol. 18 no. 4, December 2016

Including Selections from International Edition

4 Editorial

6 Stakeholders in SRI innovation systems

Suchiradipta Bhattacharjee and Saravanan Raj

10 A perspective on the working of multistakeholder processes

K V S Prasad

15 Enhancing the power of negotiation of small farmers

Debaranjan Pujahari and Aarti Dayal

19 Meeting multiple needs of small farmers

M N Kulkarni and S M Hiremath

22 One man mission

A farmer educator spreads agroecology

T M Radha

25 Joining hands to revive pastoral economy and its ecosystem

Ramesh Bhatti and Shouryamoy Das

28 New Books

29 Sources

30 Institutions come together in promoting organic farming

S Vallal Kannan, P Ananda Priya and P Tamilselvi

33 Partnerships promoting digital platforms

Amit Chakravarty



Stakeholders in agroecology

The livelihoods of a majority of farmers remain highly vulnerable to drought, disease and market fluctuations. Conventional agriculture based on high external inputs has made agriculture unremunerative and unpredictable. Multifunctional, biodiverse farming systems and localised diversified food systems are essential for ensuring food security in an era of climate change. Alternative agricultural approaches build on the principles of agro-ecology, recycling of resources and self reliance as the means to achieve this dual goal.

A transition from conventional to ecological systems is slowly taking place. This requires a different set of mindsets, skills and support systems to be operational. Also, as farmers are moving from subsistence agriculture to market/high value agriculture, they require different type of support and information.

Transition is happening in pockets, largely by farmer to farmer sharing or with the support of NGOs. For it to happen on a wider scale, support from various stakeholders is essential. The case of SRI in Tripura proves that it is possible to spread an agroecological practice like SRI to a whole state, provided there is appropriate policy and support structures in place. (Bhattacharjee and Raj, p.6)

In this issue we present experiences which show how farmers are being guided to organize themselves to learn, adopt and leverage collective benefits and the supportive roles played by diverse external agencies.

Farmer, the major stakeholder

Knowledge on agroecology is highly localized and is constantly evolving from the field. And farmer plays a key role in co-creation of knowledge as well as its dissemination. From generations, farmers have been instrumental in disseminating knowledge on agroecology. Many of us know Shri. Narayana Reddy, an organic farmer from Karnataka, who has been passionately spreading knowledge on agroecology. We have many examples of such dedicated and passionate farmers in India, who have been promoting agroecology on their own. For instance, Mr. Pradeep Kumar from Orissa (T M Radha, p.22) has been motivating a large number of farmers to practice agroecology, using local platforms like farmer networks.

Also, farmer to farmer extension has been the major driving force in the SRI movement in Tripura that has helped the social innovation get traction in the state. (Bhattacharjee and Raj, p.6)

Supportive roles of diverse stakeholders

NGOs have been pioneers in promoting agro ecology. The civil society organisations are providing the necessary support mainly working on the principles of participatory learning, community mobilization, sustainable development based on agro-ecology. By making farmers as partners in development, BAIF has enhanced the livelihood security of 21000 farmers across 505 villages in Karnataka. It has proved that critical inputs like seeds, planting materials and knowledge and motivation are enough to take their present, unsustainable agriculture towards the path of sustainability. (Kulkarni and Hiremath, p.19)

Besides promoting agroecological practices, non profit organizations like AME fostered initiatives for purposeful collaborative action by diverse stakeholders. Starting with a few members or stakeholders, the group enlarged to include diverse stakeholders from the civil societies, Research institutions, Universities etc. For instance, the Groundnut Working Group emerged as a platform for identifying major problems in groundnut crop; conduct farmer led trials using participatory technology development (PTD) method; assess results, adopt suitable alternatives and also, identify new problems emerging, which need to be addressed, in the next seasonal cycle. (KVS Prasad, p.10)

Mainstream agriculture institutions like the Krishi Vigyan Kendras through collaborative initiatives have been promoting agro ecological practices, but mainly targeted towards organic markets. For example, Krishi Vigyan Kendra in Karur with its multi institutional approach helped farmers in Karur district to switch over to organic ways of farming, in rice and sesamum. Also they established processing units for organic sesame and organic rice and an excellent network for marketing of organic produce.

The State government departments still largely promote resource intensive agriculture. However, the state of Tripura achieved a massive success in promoting SRI, an agroecological practice, through the stakeholder approach.

Major support came from various programmes like Macro Management in Agriculture (MMA), Rashtriya Krishi Vikas Yojana (RKVY) and recently introduced National Food Security Mission (NFSM). Similarly, in Bihar, JEEViKA, a World Bank supported program for poverty alleviation in rural Bihar, is implemented by Bihar Rural Livelihoods Promotion Society (BRLPS), an independent society of the Government of Bihar. JEEViKA facilitated the formation of a producer company with small and marginal farmers to provide better market support. The members capacity on weighing and grading were strengthened which made the entire marketing business transparent, thereby ensuring them better returns.

With increasing spread of digital communication tools, farmers are being supported by providing access to digital platforms. Non-profits like Technoserve and ICRISAT have been using ICT tools to help farmers. Technoserve empowered small farmers in Bihar by connecting them to information and market opportunities. ICRISAT, in the face of climate change, is helping farmers reduce risk by empowering them with information to take the right decisions, and introducing tools and technologies for diverse stakeholders to come together and work towards climate-smart agriculture.

Sustaining change processes

Diverse stakeholders are supporting farmers, individually or in partnerships. While some focus on outcomes, others focus on processes. However, to sustain the change process

initiated, a balance between both is what is required. While civil society organizations focus on processes empowering people, their initiatives are comparatively more sustainable. For example, BAIF, by making farmers pay for many activities, increased their ownership and brought down the intervention costs to a minimum. The focus has been more on building capacities, rather than doling out funds.

Transitioning to agroecology calls for different sets of capacities, mindsets and support. It means that organisations with varied competencies need to collaborate and innovative models of partnerships need to emerge. While collaborations typically engage a variety of players, including NGOs, academia, and governments, successful, sustainable change requires committed participation. Optimally, partnerships need to start with a small group of proactive individuals from organizations, have a common goal or agenda, have role clarity and, above all, build and maintain trust. (KVS Prasad, p.10). The group needs to grow organically involving all interested players and communities, with a focus on the purpose rather than position of individual stakeholder. While there is no prescribed model for stakeholder partnerships, one should evolve over time, moving from one model to another or taking on features of multiple models.



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A website for learning and sharing experiences on LEISA practices

Main Features

- Space to share your LEISA experience.
- A source for LEISA practices followed by farmers.
- An archive of LEISA India magazines – English edition and regional editions (Kannada, Tamil, Hindi, Telugu, Oriya, Punjabi and Marathi)
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Stakeholders in SRI innovation systems

Suchiradipta Bhattacharjee and Saravanan Raj

In the small North East Indian state of Tripura, System of Rice Intensification (SRI) has grown to develop into an innovation system where various stakeholders have come together to make the state self-sufficient in rice production. The lessons learnt from the SRI innovation systems in Tripura, if applied to similar crops and contexts would definitely prove to be a model for development and prosperity.

Extension, which was originally thought of as a part of the “knowledge triangle” of research, education and extension has broken free of the stereotyping to help farmers to organize themselves, linking farmers to markets and some complementary parts such as environmental and health information services. The innovation systems perspective relies on all the factors responsible for development, dissemination and use of

Farmers use markers to follow spacing in SRI paddy field



Photo: Department of Agriculture, Tripura

knowledge while putting emphasis on the relationship of stakeholders who do so. Agricultural Innovation Systems is the “new generation” of development model which emerged through policy debates in developed countries in the 1970s and 1980s. It is a network of diverse group of actors that voluntarily contribute knowledge and other resources to jointly develop or improve a social or economic process or product.

The concept of innovation has changed in recent times from a research driven process to an interactive process with much broader range of activities among the stakeholders. The term stakeholder is believed to be invented in the early 1960's as a deliberate play on the word “stockholder” of publicly-held corporations or one with a “stake” in the game is one who plays and puts some economic value at risk. Stakeholders are individuals and institutions that are concerned with or have interest in what they have stake in. Being affected by the project, they have a power to be a threat or benefit to it and may have a moral and in cases, non-negotiable right to influence the outcomes or simply may have a democratic right to be involved in the project.

System of Rice Intensification: A socially driven innovation

Innovation in Agricultural Innovation Systems (AIS) is viewed in a social and economic sense and not purely as discovery or invention and System of Rice Intensification (SRI) is a good example. It has been a unique paradigm in AIS in more than one sense. Developed by a Jesuit priest, disseminated by individual and organizations of both agricultural and non-agricultural background, the research on SRI was conducted much after the practice was developed and all this has been a fully interactive process among all the agricultural practitioners, extension professionals, research scientists and diverse other functionaries directly and indirectly related to SRI. In all, the stakeholders have played an important role in the whole process and it's mostly their interactiveness and participation at various levels and degrees that have made SRI a success worldwide.

In India, SRI was first introduced in a civil society organization, Annapoorna Farms of Auroville in Pondicherry in southern part of the country in 1999. In 2000, it was carried to Tamil Nadu state of India though articles published in magazine LEISA (Low External Input Sustainable Agriculture) where its spread was mostly led by the Government agencies. In Karnataka state of India, SRI dissemination was led by a network of organic farmers' community as well as civil societies and in Andhra Pradesh, one farmer has played a prominent role. In West Bengal and Jharkhand, civil society has played key roles in

popularising SRI. The exception has been Tripura where the state extension system has taken SRI to both the doorstep of rural households and to the policy makers' desk.

Agricultural Innovation Systems in SRI in Tripura

In a small state of 10,492 sq. km. area, only 27% of the total area of the state is cultivated of which a mere 4% is irrigated. Rice is the principal crop of the state – both in terms of production and consumption and the livelihood security of a majority of the farmers depends on it. Since SRI has taken the form of a mass movement in Tripura state, the present study was taken up to understand the involvement and contribution of different stakeholders in the state that has made SRI a people's movement. The study also tries to understand the support structures existing in the state that helped the dissemination of SRI in the state and helped increase the innovativeness of the stakeholders.

For the study, two out of four districts of the state were selected- West Tripura and Dhalai Tripura. West Tripura district, with all the agricultural research and extension organization headquarters and the state capital Agartala, has the highest area under rice and SRI (42% of the total SRI area). Dhalai Tripura identified as one of the country's 250 most backward districts has the lowest area under rice and SRI (7% of the total SRI area) in the state. Rice being the principal crop of the state, is cultivated in three seasons – *Aush* (April – June), *Aman* (July – November) and *Boro* (December – March). While in West Tripura rice is preferably cultivated in *Aman* and *Boro*, in Dhalai Tripura *Aush* and *Aman* are preferred due to scarcity of water in *Boro*.

Six stakeholder organizations were studied from each district along with sixty six farmers.

Working with various stakeholders

The public organizations, farmers and media have been the main stakeholders of SRI innovation systems in the state. Department of Agriculture, Government of Tripura (DoA, GoT) has been the lead actor in the system with technical support from Indian Institute of Rice Research (ICAR-IIRR), Telengana, India and financial and policy support from Ministry of Agriculture, Government of India. After introducing SRI as a tool to gain self sufficiency in rice in the state, the department has taken much interest in the method and has diverted a lot of available resources for promotion of SRI in the state.

The Department of Agriculture, the major promoter of SRI in the State has a very efficient intra-organizational linkage. It also shares a good relationship with the research wing

(SARS). State Agricultural Research Station (SARS), Government of Tripura, which initiated SRI in the state by conducting field trials and conducting demonstrations with the extension system has mostly been involved in research and providing technical support to the extension personnel since then. SARS looks after the R&D aspect of SRI and the extension functionaries receive regular updates from SARS to make their working more efficient. SARS has moved beyond its R&D activities, to become a key advocate of policy changes required to support and sustain SRI innovation systems.

The department involves PRIs, when needed, for implementation of any policy or programme, as they are closest to the rural people. The decentralized democratic administrative units, the Panchayati Raj Institutions have taken special interest in SRI. PRIs share good relationship with the DoA as it selects the beneficiaries for different project implementation. Farmers and SHGs, being part of the rural infrastructure, are closely related to the PRIs for any assistance. The SRI beneficiaries in the villages are selected by the village panchayat rather than DoA, selection of community extension workers (Farmers Friend) is done by the Panchayats, disbursement of funds for subsidised machineries, making provision for irrigation, *etc.* is done through the PRIs. Being village level units they have better understanding of the situation and needs of the farmers and hence are in a better position to take decisions. The suggestions of the PRIs are taken up by the Planning Section of DoA to implement them at the village level.

The DoA has been maintaining a very good relationship with the SRI farmers through the extension functionaries and has been taking care of their information and resource needs. The department has a good relationship with the SHGs in the West, while it is fair in Dhalai. This is so because the numbers of SHGs in West were much higher than in Dhalai.

Krishi Vigyan Kendra or Farm Science Centre, Dhalai Tripura, under the host organization Directorate of Agriculture, Government of Tripura also played an important role in Dhalai district to disseminate the technology. Though recently introduced in SRI innovation systems, its high interest has already made it an important stakeholder in the state. The resources allocated to the Farm Science Centre are distributed according to the requirement of the institution

and it has full control over the decisions made and this made it an important stakeholder in the SRI innovation systems in Dhalai district.

Media is working on their own for public interest, through extensive publications and broadcasts. Media (newspapers, TV channels, Akashvani Agartala radio station), as one of the stakeholders in SRI innovation systems, undertook extensive coverage of SRI (2-3 articles on SRI each month; publication and broadcast of interviews of successful farmers and extension personnel; success stories of farmers of the state and programs and articles about technology and economic and sustainable aspects of SRI). This created awareness among agriculture and rural development administrators (the ministers and officials of Government of Tripura), policy makers (at all the administrative levels in the state), political leaders, extension personnel and farmers.

The Indian Council of Agricultural Research (ICAR) Research Centre for NEH Region, Tripura Centre was also initially involved in research and dissemination of SRI in the state, which has now shifted to other research as the adoption has gained a self-sustaining momentum among the farmers.

Farmers, their relationship with other stakeholders

Farmers have been the most important stakeholders of SRI in the state. Even though they have been basically receivers of the technology, but their high stake in the whole innovation system, and enthusiasm and ready acceptance has made SRI a big success in the state. Also, farmer to farmer extension has been the major driving force in the SRI movement in Tripura that has helped the social innovation get traction in the state.

The farmers received strong information support from the department, other farmers and the PRIs and medium support from the SHGs. The farmers had poor relationship with ICAR-RC for NEH Region, Tripura Centre and SARS. In the village, the VLWs are considered as the most credible source of information on SRI and the farmers depended on them for all their information needs. Other than that, they also receive assistance from the Agricultural Extension Officers and the Krishak Bandhu. Since the Panchayat selects beneficiaries for SRI, the farmers stay in close contact with the Panchayat for any assistance and also for other necessities like subsidised machineries for intercultural operations, pump sets for irrigation, *etc.* Other than that, every 3-4 days in a week, the farmers sit together in informal gatherings in the villages and exchange information among them. Farmers of Dhalai shared a good relation with the

Farmers with regular water source were more inclined to SRI, thus depending on other farmers, extension personnel and media for information.

KVK as the KVK personnel visited the farmers' field once or twice a week to keep in touch with them. But farmers of West Tripura district did not have any direct link with the SARS which was more closely involved with the extension personnel.

The better educated farmers were found to visit the VLW office and Panchayat Office at least once a week to collect information regarding SRI and other aspects of farming. Almost every day they have been found to meet up with other farmers in the evening and discuss farming related queries. Farmers with a regular water source were more inclined to SRI, thus depending on other farmers, extension personnel and media for information. Farmers had more inclination towards staying informed through connections with different sources regarding new technologies and government schemes and subsidies aimed towards farmers. Most of the respondents were solely dependent on agriculture and hence were more eager to get information regarding SRI by maintaining a good relation with extension personnel and fellow SRI farmers.

Policy and support structure

Policies and support structures that have been existing in the state since the introduction of SRI gave farmers the courage to take up SRI. Earlier they thought it was a huge risk to take up SRI. Also with increasing support from the government to SRI, which made rice cultivation more remunerative, farmers were keen to switch over to SRI paddy. Major support came from various programmes like Perspective Plan of Government of Tripura, Macro Management in Agriculture (MMA), Rashtriya Krishi Vikas Yojana (RKVY) and recently introduced National Food Security Mission (NFSM). During the initial stages of SRI in the state, the fund for research and promotion was received from MMA till RKVY funds were allocated for the purpose

in the year 2008-2009. The NFSM fund is being utilized for SRI since 2011-12.

Conclusion

SRI has spread among the farmers of the state at a very fast rate. Large scale adoption which started in 2006 with 1000 farmers, increased to 70,000 in a mere two years (Uphoff, 2008). As of 2014-15, 92,341 ha area is under SRI and the target is to reach 100,000 ha by 2020. SRI has transformed the way rice was cultivated in the state and the whole process involved efforts from several quarters of extension, research, and decentralized grassroots level governance bodies.

The stakeholders are central to any innovation systems and their actions ultimately decide its success or failure. In the case of SRI in Tripura, the extension mechanism, decentralized grassroots level administrative units, and media became the driving force in making SRI a successful innovation in the state and a major aide in achieving self-sufficiency in rice grains.



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A perspective on the working of multistakeholder processes

K V S Prasad

While multi stakeholder processes is desirable for promotion of agro ecology on a wider scale, in practice, it is not as simple as it is thought to be. AME Foundation's experience in fostering such processes shows that the success depends on several factors. In fact, adhering to certain basic principles is necessary to keep the process going.

Today, agro ecological approaches are increasingly being recognised as a most promising solution to address rural food and nutritional security, improving farm productivity and incomes while caring for environmental well-being. It is also being recognised that collective action is necessary for initiating and sustaining change processes as the dominant paradigm is still caught up in unsustainable farming practices which are a threat to farmer livelihoods as well as environment.

There are lot of efforts by the development practitioners to articulate and promote several institutional arrangements/ models of working together – some highly pragmatic, some ideal, some process heavy, invariably caught in the noose of short duration project timeframes. For them to succeed, intent alone is not sufficient. Firstly, it should be rooted in the specific local context, needs and opportunities. Secondly, there should be necessary patience to allow them to evolve organically, rather than squeeze them through templates. Lastly, as one expert put it, quite radically, these platforms need not exist beyond their period of purpose too.

Presented below are some of the learning outcomes from two specific cases of multistakeholder processes, which AME facilitated. One deals with Groundnut Working group and the other with Urban and Peri urban agriculture initiatives – both involving diverse stakeholders. The results and outcomes are based on the organisational memory with added reflections/perspectives by the author.



Photo: AMEF

Groundnut Consultative Workshop

Groundnut Working Group

During the project phase, in 1996-97, AME began fostering initiatives for purposeful collaborative action by diverse stakeholders in the development process. This was done primarily to widen the basket of options available for a dry land farmer to address problems being faced in a specific crop based farming system. Beginning with PRAs to understand the farmer situations in each specific location, specific crop based Participatory Technology Development (PTD) processes were facilitated to enable farmers identify major problems in the crop; conduct farmer led trials by including options what they know and those made available by specialists; assess results, adopt suitable alternatives; also, identify new problems emerging, which need to be addressed, in the next seasonal cycle. This process was linked to the multistakeholder process which brought together several diverse groups to focus on these ground realities.

Here begins the first departure from usual models. The multistakeholder processes for addressing the Groundnut productivity challenges didn't start with a 'blue print' and a

fixed 'roadmap'. The immediate problem of the farmer, set the agenda. Few enthusiastic individuals working on the problem in diverse backgrounds were contacted. Gradually, they started interacting as a group, informally first and later formally during annual meets. The options were integrated into PTD trials conducted by farmers working with AME and its NGO partners. As these options had to be eco-friendly, affordable and locally suitable, alternatives were limited and often not easily forthcoming. At the end of the season, AME along with its NGO partners, facilitated large farmer meets where farmers assessment of results across three states was consolidated. These findings were fed into the annual meets. During annual meets, the practitioners and academics put their minds together, shared their learnings, and suggested various options for trials. Also, major problems emerging from the farmer meets were flagged as potential agenda points for further research and action. The review and planning processes of the annual meet of the stakeholders focused on these field realities.

Gradually, the group grew organically, in size and in diversity, to evolve as a platform with an identifiable commonality of purpose. From individuals, it grew into a platform where institutions they belong to also wanted to get formally involved. The group started gaining recognition at various levels. National and International research systems like Australian Council of Agricultural Research, NRCCG, ICRISAT, CRIDA, State Agricultural Universities, Central IPM centres, MANAGE, to name a few, actively participated. Some of them sponsored and co-organised the annual meets. Gradually, financial institutions like NABARD and input suppliers got involved for extending support to farmers. Most importantly, each annual meet addressed a specific major problem being faced in groundnut

Box 1:

Born in response to negative effects of high input agriculture, AME started as an innovative training programme in ecological agriculture in the year 1982 in the Netherlands. After relocating to India, established unique identity by promoting ecological agriculture and farmer centric participatory learning processes. During 1996-2001, operated as a Indo-Dutch bilateral project, implemented by ETC India. Later, in the year 2002, AME project became AME Foundation. All along, AME has focussed on LEISA approaches, participatory learning processes in the rain fed areas where small holders are the majority.

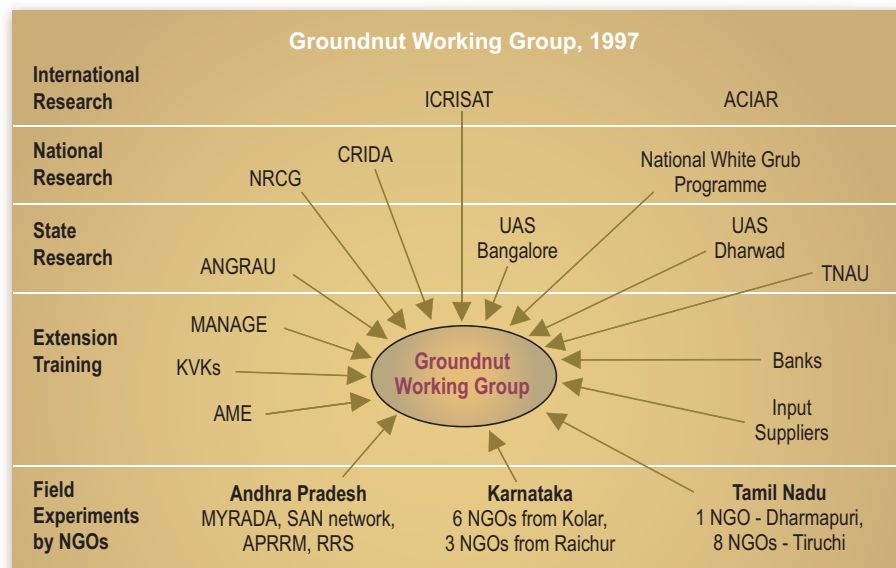
based farming system and inviting those who can offer a solution to that. Thus, the purpose was overriding power and status; action oriented initiatives prevailing rather than academic discourses.

Another significant aspect of the process, though challenging was, creating a mutual respect between formal and informal knowledge systems, each with their inherent strengths. Generally, during the annual meets, the previous season's results were reviewed vis a vis options tried out. While farmers assessed the options for their utility, solutions emerging from field were taken up for further formal research studies. Thus, it was a two way learning ...and in milder terms – a two way validation process! This not only helped in enhanced mutual respect between diverse stakeholders but also enhancing mutual accountabilities too.

New institutional collaborations emerged based on recognition of farmer's abilities. For instance, in the year 1999, based on groundnut seed route study presented by AME, reputed universities and research institutes who are

part of the platform, offered to supply nucleus seeds to farmers for breeder seed production (BSP). Thus the platform subtly influenced institutional policies.

Sheer presence in these workshops resulted in higher self-esteem for the farmers as experimenters and the ultimate users of alternatives. While in initial years, the presentations were done by NGOs (AME and its partner NGOs), based on summarised results from farmer meets, in later years, farmer representatives started participating in the annual meetings of the Groundnut Working Groups (GWG). Recognition and visibility of



farmers increased. Infact, one of the annual National Groundnut Workshops was inaugurated by a woman farmer.

The Groundnut working group as a platform was operational from 1996-2005. AME as one of the primary resource agencies promoting LEISA, agro ecological approaches and participatory facilitative multi stakeholder processes, showed possibilities of working together through this Groundnut Working Group.

Urban Agriculture (UA) Platform

AME Foundation facilitated yet another multistakeholder process in a relatively new area of intervention – Urban Agriculture.

The Project perspective developed by RUAF, The Netherlands, was based on the vision that policy centric initiatives could be initiated in urban areas like Bangalore and Hyderabad. This was inspired by similar initiatives in countries like Sri Lanka, Philippines etc. AME Foundation was requested by IWMI, the implementing agency, to be a consultant to anchor the process in Bangalore. While the relevance of urban agriculture was a unique approach ahead of its times, it was to be seen how it could be taken up in a growing city like Bangalore. Bangalore had the uniqueness of being a traditional green city, but also one the fastest growing cities with rapid urban expansion.

The project strategy was to build capacities of diverse stakeholders on how to implement a stakeholder concerted action for creating an enabling policy environment for urban agriculture in Bangalore. It was soon realised that the process does not work that way, at least in Bangalore. The top busy policy makers were not prepared to be subjected to a long step by step process learning curriculum. Also, several high level bodies were involved in the redrawing green belt area to attract investments as a IT and service sector hub. While they were keen to appreciate the purpose of the programme,

to an extent, they had no time to be involved in the ‘learning process’ designed for them.

We had to start afresh to redefine the scope of the project in a fast growing city like Bangalore, with planners and to a large extent citizens interest in green spaces. Also, we were conscious that for sustainable cities, the lifeline is also strengthening peri-urban agriculture areas, traditionally supporting the food supplies to the growing city. During the inception meeting to launch the programme, after initial unclarities, the discussions gradually got focussed. The project scope was redefined to include urban horticulture initiatives and peri urban agriculture in a specific area was vetted in the inception meeting.

Separate ‘enabling teams’ of multiple stakeholders was forged for urban and peri urban areas separately. The Bangalore enabling team consisted of reputed NGOs (5), Depts. of Government (3), renowned Individuals (2), Knowledge specialists (2) Resident Associations (3). The peri urban team consisted of all departments, Town administration, Farmer Groups, NGOs. The enabling teams were very clear that such initiatives need to be people centred and people driven, even to gain interest of the policy makers.

An exploratory study was conducted by the enabling team to examine both the urban and peri urban contexts and opportunities. The enabling team took it as the first challenge to conduct a study which could serve also as a spring board for some action later. Roles were assigned among the stakeholders to lead the study and to pursue different parts of the study, within accepted timelines. It had to be a patient, disciplined process, for the diverse stakeholders to come to consensus within the project framework.

One of the key factors for success was frequent meetings (sixty in one and half years) with non-compromising approach with regard to clarity of purpose, specific agendas and peer reviewing on progress made, and constant enthusiasm to make a difference through synergies. Some of the members played an advisory role for the enabling team. Sometimes, they played the role of ‘devil’s advocate’ role within the discussions.

Similar multistakeholder processes were followed in the peri-urban area in Magadi where line departments actively took part. Here too, the momentum was built systematically with several rounds of focused discussions with farming communities, officials and various departments and public meetings enabled formation of an enabling team for further field action. Repeatedly, how an international program chose this area for its cooperative and progressive attitudes was highlighted. With the enthusiasm created, with lesser intellectual conflicts, it was easier to involve the line

Photo: AMEF



A meeting of stakeholders in promoting periurban agriculture

departments for joint action. AMEF's credibility carried a huge advantage.

AMEF has been continuing the urban initiatives through direct training to the citizens on urban home gardens and the peri-urban farmers further got involved in producing eco-friendly farm produce while conserving local biodiversity.

Some learnings

The two stakeholder platforms has provided rich experience for AME in multistakeholder processes. While some of the major learnings from the two multistakeholder processes are presented below, it can be safely concluded that the successful functioning of the groups to a large extent can be attributed to their acceptance to certain basic and operational principles of functioning. (see Box 2).

Focussed Agenda

The most crucial component in such processes is the agenda setting, as diverse stakeholders participating in the processes have their own mandates. Agenda needs to be specific and farmer need centred. For instance, in the GWG, the agenda was centered around farmer problems and the platform explored options for ecofriendly pest and disease management of white grub and leaf miner, improved agronomic practices and seed varieties, Aflatoxin assessment studies and identification of research study topics for formal academic and research institutions.

Role clarity

It is important that every stakeholder is clear about his role and his contribution towards the process. In GWG, while research institutions tried to find solutions to farmers problems, farmers tried various options on their fields for testing their suitability. In the UA platform, there was clear role clarity right from conducting the exploratory studies.

Action oriented activities

Diverse stakeholders continue to work together only when they see some role for themselves in taking action. For example, in UA platform, the enabling teams got restless too for action. Thus, the enabling teams went beyond the project expectations of doing studies to initiate some tangible action. As a result, two pilot projects were conceived - one on strengthening peri urban agriculture initiatives and another, on building the capacities of citizens of residential areas on urban home gardening. In case of GWG, a possibility of knowledge being put to use as well as mechanisms for feedback on its utility from the field, made the deliberations pragmatic and action oriented. For example, results of seed trials.

Box 2: Functioning of Multi-stakeholder processes/ platforms

Basic principles

- Willingness to work together - Long term interests rather than short term conveniences
- Mutual Cooperation based on agreed common interests and actions - Past collaborative behaviors do play a part
- Mutual Respect built on known competencies - appreciation of each other's competencies
- Shared, transparent, functional and facilitative leadership

Working principles

- Minimizing ideological posturing and identifying pragmatic areas for cooperation
- Defining long term and short term goals - doable and achievable
- Identifying joint activities and tasks – both short term and long term
- Creating a comfortable 'pace' as well as 'space' for joint working
- Vertical as well as horizontal accountabilities - accountability to partners too
- Working together mutually acceptable review mechanisms through consensus
- More meetings in the beginning for common understanding – Compulsory minutes of the action points/ agreements/ deadlines/ agreed roles
- Exploring acceptable and transparent financial arrangements

Advisory panel

- Need for personalities with lot of humility as well as experience
- Persons with great reputation of service and wisdom, ability to influence rather than power and present position.
- They should not be involved in the micromanagement but help in widening vision.

Overall, platforms need to grow organically, strive for creating positive energies and synergies, recognize and celebrate collective and individual achievements; while continuously learn to deal with challenges.

Appropriate time frames

Bringing diverse stakeholders with different mandates and interests to achieve a common goal is a highly time consuming process. Quick results cannot be expected in a short span when transformation sought is of a total change in mindset, practice and policy. Also, different contextual

While farmers assessed the options for their utility, solutions emerging from field were taken up for further formal research studies.

realities need to be factored in while estimating duration of intervention. GWG with a long term support served its purpose. On the other hand, in the case of UA platform, the project life cycle got over, by the time momentum was built.

Mutual Respect

Stakeholders from different backgrounds come with different sets of knowledge systems. In both the cases, with a better understanding about each other, **mutual respect** for various knowledge systems represented by farmers, NGOs, academics and researchers, increased. Though patient listening to each other was initially difficult, the personal conviction and commitment of the individuals helped and enriched the learning process.

Acknowledgements: The author gratefully acknowledges the contributions made by Mr H. Lanting in conceptualizing Groundnut Working Group, Shri C.K. Subramanian in organizing Annual Groundnut Workshops. Similarly, the role and cooperation of RUAF team and project leadership of Dr. Robert Simmons, IWMI is deeply acknowledged.

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Call for Articles

Food Sovereignty

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The March 2017 issue of LEISA India will focus on food sovereignty. For many people, this remains an abstract term and therefore time has come to 'unpack' it. Food sovereignty is about the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. Asia continues to rely on traditional food systems for most of its food supply. But globalization and the entry and aggressive expansion of multinational food corporations, has had major impacts on small scale farmers, traders and consumers. Food and farming systems are taken out of the hands of farmers – shifting control from farmers to a few multinational companies for seeds and chemicals.

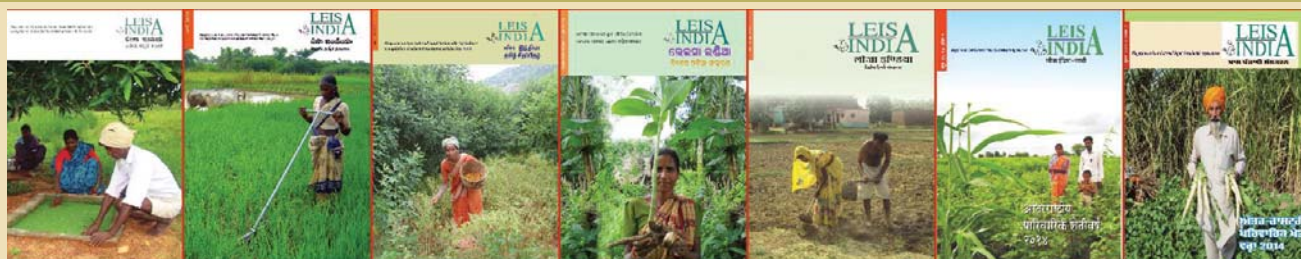
On the other hand, the expansion of global and national super markets exerts increasing influence over what people eat and how that food is produced. Cheap packaged and processed food is replacing healthier daily meals influencing the health of the people.

As a resistance to the changing situations, which are not favourable to the small holder farmers livelihoods or to the overall health of the citizens, a number of peoples movements emerged, both at the national as well as at the international levels. For example *La Via Campesina*, an international peasants' movement, has been fighting for restoring food sovereignty. Similarly, we find local initiatives such as *The Anna Swaraj Abhiyan*, by Navdanya, which was launched to connect producers to consumers and the village with the town in direct links through safe, fresh, local and fair food.

In this issue we would like to capture the full range of experiences – from agroecological practices on farms to emerging scientific insights, to linking producers and consumers and participating in movement and alliance building. We want to capture how local initiatives are leading to changes at national and international levels. What are people doing to claim and build their own food sovereignty? What strategies have farmers, fisher people and consumers developed to create space for themselves in the context of large multinationals, agribusiness, and strict regulatory measures that are not in favour of small producers? How are local experiences shaping and being shaped by global initiatives?

Articles for the March 2017 issue of LEISA India should be sent to the Editors before 31st January 2017. Email: leisaindia@yahoo.co.in

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Enhancing the power of negotiation of small farmers

Debaranjan Pujahari and Aarti Dayal

Non profits like Technoserve, through partnerships, are contributing towards empowering small farmers by connecting them to information and market opportunities. Through their initiative, small farmers in Bihar, as members of farmer producer groups, realised the power of negotiation through collective marketing.

Purnia district located in the maize belt of Bihar, is known to have the highest productivity of *rabi* (winter crop) maize in the nation at 4 tons/ac. Maize is the primary cash crop for farmers in the district and most of them are small and marginal farmers with an average land holding of 1.39 acres. While the marketable surplus of these farmers is nearly 90%, they have limited access to *mandis* (large markets where farm produce is sold). In the absence of an alternative solution, they depend on multiple intermediaries for selling their produce.

The intermediary chain is very big and wide ranging from collection agents at the village level to brokers at each *mandi* to large traders who eventually sell the produce to institutional buyers across the country. Each intermediary charges a commission, reducing the final price that the farmer receives. In addition to this, collection agents in villages follow manual grading processes and are known for weighing malpractices that lead to significant losses (approximately Rs.60 – Rs.80 on each quintal of produce procured from farmers). Repealing of the Agricultural Produce Marketing Committee (APMC) Act has also worsened the market infrastructure and trading regulations. Price is now decided by a few big traders and grain quality is judged by its look and feel, without the use of moisture meters. This combination of an unorganised trade network consisting of multiple market intermediaries with weighing and grading malpractices significantly reduces the final price that the farmers receive for their produce.



Photo: Author

Shakila Khatun, a proud and happy member of AAPCL

Collectivising women farmers through Farmer Producer Companies

Keeping in mind the above mentioned issues faced by small and marginal farmers in Bihar, JEEViKA, a World Bank supported program for poverty alleviation in rural Bihar, floated a producer company called Aryanyak Agri Producer Company Limited (AAPCL). JEEViKA (which means livelihood in Sanskrit) is implemented by Bihar Rural Livelihoods Promotion Society (BRLPS), an independent society of the Government of Bihar. The organization has

been designated as the State Rural Livelihoods Mission (SRLM) to rollout National Rural Livelihoods Mission in Bihar.

AAPCL was established in November, 2009 under the Companies (Amendment) Act 2002, with its registered office at district Purnia. Initially, AAPCL had an authorized share capital of INR 5 lakhs and could issue 50,000 shares, each worth Rs. 10 to the small and marginal farmers, categorically the target families of JEEViKA. The shareholders belonged primarily to the Dhamdaha block of the district.

Even though AAPCL came into being in 2009, it was not active as most producer groups under it were defunct. A majority of the women producer groups in Bihar largely represent small and marginal farmers with little capacity to directly market their produce themselves or hold back the produce to gain lean season premium. The management of these producer groups lacks an understanding of the various marketing tools and does not have the skill to negotiate with buyers, leading to higher risks and losses. As a result of this, the members have never realised the potential of collective aggregation and marketing.

The partnership initiative

To address this need, JEEViKA, in partnership with TechnoServe India, launched a technical assistance project in Bihar in December, 2014. TechnoServe is a different type

of nonprofit, which helps the poor people by connecting them to information and market opportunities. The objective of the project, funded by the Bill & Melinda Gates

Foundation, was to build the capacity of the JEEViKA team on value chain development, organize women farmers in two target districts of Bihar into market oriented Farmer Producer Organizations, provide technical assistance to producer groups in Bihar and develop a multi-year roadmap to facilitate producer group formation and strengthen the broader producer group ecosystem in the state. To achieve these objectives, TechnoServe initiated a pilot in Purnia district to demonstrate higher price realization to farmers through collective aggregation and marketing of produce, reducing information asymmetry and reaching out to national buyers through commodity exchange platforms.

Based on an initial assessment of the producer groups in Purnia, their crop profile and existing post-harvest challenges faced, TechnoServe India recommended the AAPCL to adopt an aggregation and market linkage business model which eliminates multiple layers of intermediaries and thus ensures



Digital Moisture Meters help PG members sell better quality Maize

Photo: Author

AAPCL members look forward to expanding their company's business



Photo: Author

better price realization and also allows farmers to benefit from off season price increases. The project further recommended the producer company to sell their produce on an electronic trading platform to minimize risk.

Leveraging JEEViKA's institutional mechanism, AAPCL raised approx. INR 60 lakhs working capital through internal sources – Producer Groups (gap funding) and Cluster Level Federations (loan @0.6% per month) to do maize procurement and marketing. AAPCL members were trained on the post-harvest practices of maize – standard weighing and grading practices (electronic weighing machines, digital moisture meters etc.) to ensure transparency during collection and sales. An electronic trading platform (NCDEX E Markets Ltd - NeML) was used to reach out to major buyers across India. Farmers' produce was stored in NeML certified warehouses after quality checks and sold to institutional buyers in both the spot market (NeML) as well as futures markets (NCDEX) to maximize returns. With this process, the producer company became the first farmer producer company in India to be registered under the NCDEX platform for forward trading in maize.

In 2015, 300 women from AAPCL sold their maize online, and in 2016, this number went up to 818 women. The main business figures of the producer company for the last two maize seasons are detailed in the table below.

In addition to the benefits mentioned above, the revival of the producer company made the members aware of how transparent the business should be, and they have thus started asking for better prices from the local collection agents. They are also pressurizing the agents to replace their uncalibrated manual weighing scales and hand based grading practices

The use of an electronic trading platform helped the producer company to get connected with nationwide buyers while preventing the risk of delay in payment.



Photo: Author

Use of electronic weighing machines has brought transparency in weighing practices

with industry standard equipment and practices. The use of an electronic trading platform helped the producer company to get connected with nationwide buyers while preventing the risk of delay in payment and any breach of contract by the buyers. Also, with the members receiving the payment for their produce within 3-5 days of sale, they have been able to ensure timely repayment of crop/ other loans.

The producer company sold maize under the brand name 'JEEViKA Maize' and has earned a lot of traction from the buyers because of the higher quality produce. The availability of moisture meter with every producer group helped the members to dry and clean the maize before sale, thus making it Grade A maize.

Highlights – Maize Procurement

2014-15 Season	2015-16 Season
1014 MT maize procured	3064 MT of maize procured
AAPCL revenue 1.28 cr; net profit 0.09 cr	Total revenue earned by the PC till end July is 75 Lacs
11.46% incremental revenue to farmers	Average price offered to PG members who sold maize to AAPCL 13.6% higher than the previous year
70% profit distributed as patronage bonus to members	INR 3.49 Crore transferred in account of 818 members from 27 PGs
Additional return of INR 109 per quintal due to patronage bonus	138% increase in the member's participation in maize selling to AAPCL compared to last year

A Beneficiary Speaks

"I will always sell my produce to the producer company from now on!"

Shakila Khatun is a native resident of Kukrun east village in Purnia district. She is 40 years old and stays in a joint family of 11 members. Having 8 acres of land, the family's major income comes from agriculture. Maize is grown on 95% of the land, while wheat is grown for self-consumption. Rice is grown during *kharif* season, 50% of which is sold in the local market. Even after the cyclonic-wind in the month of May, her production of maize was 27.7 MT this year. Till last year, she used to sell her maize produce to Mr. Mustaq, a village-level-aggregator-cum-trader who picked the maize from her doorstep and offered a price based on hand grading practices. Weighing was done on a handmade wooden weighing machine on which the *adhaliyas* (intermediaries) always take 7-8 Kg per quintal higher produce showing the reason as moisture loss. Like many others, Shakila doesn't have a say to negotiate with Mr. Mustaq, as she has also taken a loan during the period of crop sowing.

During the first week of March 2015, Shakila participated in the Annapurna producer group meeting, of which she is a member, and came to know that the producer groups will procure maize and sell to AAPCL this season. She participated in all the meetings organised by JEEViKA and TechnoServe team, understood the procedure, and

spread the information to all the members of the groups.

She took extra care on the post-harvest practices of maize suggested by the project team, and as a result 100% of her maize was sold as Grade-A produce to the producer group. She herself used the moisture meter to measure the moisture

content of her grain. Accurate weight of the produce was measured through the electronic weighing scale and payment was credited directly to her bank account within 3 days of procurement. Such level of transparency convinced her to sell 100% of her produce to the producer group. She earned an average price of INR 1003 per quintal, 6% higher than what she would have got had she sold her produce to Mr. Mustaq. Being a shareholder of the producer company, she will also receive patronage bonus if the company makes enough profit at the end of the financial year, taking her increased price realization to 11.3%.

"This is the first time in my life that I've seen someone procure maize from a farmer's doorstep with such transparent procedure. Not only me, but all didis (producer group members) will sell maize to the producer company from now on."

- Shakila Khatun, Member, Annapurna Producer Group, April 24, 2015

Expanding to Muzaffarpur

In addition to maize, in May 2016, JEEViKA, with TechnoServe's support, initiated a pilot in Litchi and vegetables market linkage to cut out the middlemen and provide direct market access to the farmers. To do this, the pilot aimed to strengthen Samarpan Jeevika Mahila Kisan Producer Company Limited (SJMKPCL), Muzaffarpur.

SJMKPCL has procured 6120 kgs of litchi as a pilot intervention in the 2016 season. Four thousand kilograms were sold on NeML to distant markets of Mumbai, Ahmedabad and Bangalore. The producer company earned INR 5.0 lakhs as net revenue from the litchi business with 8% net profit. Though the number of farmers who participated in the pilot was less, the spot purchase farmers earned an incremental price of 16% while contracted farmers realized better price and assured payment.

As for vegetable market linkage, 5 MT (~INR 1.5 lakhs) of vegetables were supplied by the farmers in Sakra block to Big Bazaar, an organised retail chain in one month (August, 2016).

Way Forward

Moving forward, AAPCL will focus not only on maize but also other commodities like potato and banana. SJMKPCL, on the other hand, will try to expand its business in the litchi

and vegetables value chain, and will also get into pulses. Both companies plan to undertake input (fertiliser) supply business as there is a great demand from the members for the same. AAPCL aims to expand its shareholder base to 10,000 farmers in the next 3 years and plans to reach a turnover of 100 crore.

All the producer company members have acknowledged the power of negotiation through collective marketing. They feel proud to be a part of a producer company and have already started making plans for its expansion.

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Meeting multiple needs of small farmers

M N Kulkarni and S M Hiremath

NGOs have been pioneers in promoting agro ecology. By making farmers as partners in development, BAIF has enhanced the livelihood security of 21000 farmers across 505 villages in Karnataka. It has proved that critical inputs like seeds, planting materials and knowledge and motivation are enough to take their present, unsustainable agriculture towards the path of sustainability.

BAIF's saga of integrating the small and marginal farms with fruit trees, forestry trees (fodder trees, biomass species, timber and fuel wood species), fodder on bunds with soil and water management (tree based farming system, TBFS) was started back in 1985. TBFS was implemented on a pilot basis in selected villages of Hunsur taluk, Mysore district during 1985 to 1990.

What is tree based farming system?

TBFS is also popularly known as WADI, meaning "orchard" in Gujarati. TBFS includes a menu of low cost, environment friendly activities like- planting of horticulture trees, forestry trees, fodder trees, fodder grasses, adopting enriched composting methods, natural methods for disease and pest management, dairy animals, small ruminants, soil and water conservation measures etc. In this practice, farmers are encouraged to plant 35 to 40 fruit species (mango, tamarind,



Its family farming with TBFS

cashew, guava, etc) and 8-10 forestry species per acre. The fruit plants can be planted in the cropping field or they can also be aligned along the internal bunds and boundary bunds. Fruit trees start bearing fruits from the 5th year planting and would fetch income for the farmers.

Forestry plants can be planted along the field bunds and field boundaries. The forestry plants need to include fuel wood species like *Acacia auriculiformis*, *Cassia*, *Glyricidia*, timber species like-teak, silver oak, *melia dubia*, *dalbergia* etc. *Sesbania*, *erythrina*, *subabul*, *moringa* yield good quality fodder, thus sustaining dairy activities. The forestry plants start producing biomass and fuel wood after 4th year of planting. Biomass produced from forestry plants can be used as substrate for producing vermicompost and applied to the field. This helps to reduce the application of chemical fertilisers and thus reducing the emission of nitrous oxide to the atmosphere. There will be enough fuel wood production by the 5th year of plantation. This will meet the fuel wood needs of the family and reduces pressure on forests. Thus, in a period of 5-6 years, dry lands under TBFS will become diversified farms with increased food security, fodder availability and resilience from climate change effects.

It is found that soils under TBFS or organic farming would harvest 733 – 3000 KG or more carbon per hectare per year from the atmosphere. Increasing the sequestration of carbon



Photo: Author

View of TBFS with trees, crops and fodder

in soils is a vital aspect of climate change mitigation. By increasing carbon absorption, TBFS has a lower climate impact than modern agriculture.

Integrating a new idea

Integrating trees in the farming system is an insurance against crop losses and also helps in preserving the environment. Thus, tree based farming system (TBFS) is good in the larger interest of the farming community and environment. However, farmers do not perceive it that way, as they have to wait before the trees start yielding. Hence, the role of implementing agency becomes very crucial in motivating farmers to practice TBFS.

Village meetings, personal contacts and focus group discussions were organized to explain the concept with economic and environmental benefits. Exposure visits to successful TBFS locations facilitated farmer to farmer sharing and learning. This was followed by demonstrations of pit excavation, pit filling and planting methods and also activities like basin preparation, shading, mulching and after care activities. Good quality planting materials were supplied to ensure timely plantation. The planted area is protected by live fence to avoid grazing by stray cattle. Village level trainings and frequent follow up visits ensured disease and pest management. Also, facilitated building marketing linkages and linkages with the State departments to avail benefits.

Impacts

There is significant improvement in soil productivity in TBF plots. Tree coverage in the project villages has improved

Box 1: Irfan sees his future in TBFS

Irfan Kamadolli, 31, resides in Hirebendigeri village in Haveri district with his family. He owns three acres of rainfed land. Earlier, Irfan was engaged in construction work in Goa. Eight years ago he returned to his village, but he was in a confused state about his livelihood in the absence of assured water for agriculture. He was growing sorghum, little millet and groundnut worth Rs. 30,000/- per annum in three acres. He owns a pair of bullocks and two cows. He used to depend on crop residues for fodder and made use of the compost for his land. He engaged in agriculture for six months and engaged in labour work for the other six months.

Initially, he was reluctant to adopt TBF stating that 'we cannot look after the plants year around, as we come to the land for only six months during the season and engage in labour work for the rest of the time'. However, finally, in 2010 he had decided to join the project. The project assisted him with critical inputs such as mango grafts, forestry seedlings and fodder seeds. Irfan took utmost care and followed the technical inputs provided by the staff to nourish 120 mango plants. He brought the water in pots from the village and hired water tanks to provide protective irrigation during summer.

His hard work started yielding. During 2014, he sold graded mangoes in the market. On an average, he earns Rs. 30000 from sale of fruits per year. He also grows maize and vegetables as intercrops.

Now, the TBF has revived his hopes for the future. He goes to the field everyday and says 'There is some work to be attended every day and it gives me pleasure to see greenery in my land'.

the micro-climate. One can experience the cool climate in the TBFS land compared to non TBFS land.

Due to TBFS, soil and water conservation, organic farming, and livestock, the family income has improved significantly. On an average, farmers earn Rs.10000 to 12000 per acre from fifth year of plantation. This is in addition to the intercrops that were also grown in the same land.

Fodder trees, shrubs and grasses planted on bunds and barren lands have improved fodder availability. This has motivated farmers to go for rearing of small ruminants like sheep or goat and one or two dairy animals.

The families who have adopted TBFS are able to get firewood from their farms thereby reducing the hardship

Increased availability of plant biomass has motivated farmers to go in for rearing small ruminants like sheep or goat and in some cases dairy animals.

for women who used to walk to nearby forests and village common lands to collect firewood. Also there is less pressure on forests too.

Enhancing the role of farmer as stakeholder

BAIF has been implementing the TBFS with the financial support of several donors like DANIDA, CAPART, Government of India, Government of Karnataka, NABARD, Deshpande Foundation etc. In all these programmes, the funding agency, the implementing agency and the farmers have worked in tandem. Over the years, it can be clearly seen that these programmes had greater role for the farmers in planning and implementation.

During the pilot phase, farmers had to be supported and compensated for implementing every new idea. There were several cash incentives to farmers for adopting TBF like pit excavation, planting, aftercare, farm bunding, watch and ward, fencing and watering during summer. Apart from this, there were other expenses like exposure, training and field demonstrations. The cost per acre shot up to Rs. 30000 during the pilot project period.

For increasing the ownership of farmers in the programme, BAIF had to change its strategies from time to time. Cash incentives to farmers were minimized from 1995 onwards. The concept of cost sharing, both in the form of kind and cash was introduced for the projects implemented since

1995. Gradually, farmers started contributing for specific activities like pit excavation, plantation, aftercare etc. In some of the programmes, they made cash contribution to the extent of Rs.500 per acre and in some cases contributed in the form of labour. Today, the cost for adopting TBFS has come down to Rs. 7000 per acre. This includes man power and administration costs also.

We have reached a stage, wherein, TBFS can be scaled up with critical inputs like good quality planting materials at subsidized costs, exposure and motivation. The model has been demonstrated well and accepted by the farmers across Karnataka. NABARD is replicating this model across the country under tribal development funds. Department of Tribal Affairs, Government of India, has recognized BAIF as a resource organisation for implementation of WADI in tribal belts of India.



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Box 2: Bounties from mixed farming

Sri. Gangaiah Vibhutimath, is a marginal farmer of Madapur village, Savanur taluk in Haveri district. He owns one and half acre dry land. Before 2008, he was cultivating only annual crops like sorghum, maize, chilly and pulses under rain fed system. During 2008, he started to diversify agriculture by adopting mixed farming system by planting sapota, mango, lemon, guava and curry leaf. He got the support for planting materials through Samrudhi project supported by Deshpande Foundation.

He took care of the trees by providing protective irrigation during the summer. Now, his land consists of 41 sapota, 70 curry leaf, eight mango and six lemon trees. He is also growing flowers (aster and kanakambara), fodder and annual crops as intercrops in the same land. The horticulture trees have started yielding since 2013 onwards. During 2015, he earned Rs. 10000 from sale of sapota and guava fruits. His average income from sale of flowers is Rs. 20000 per month. He sells flowers at Savanur market, 10 km from Madapur. All put together, he earns Rs. 1.8 lakh annually. This is apart from the harvests from annual crops which he uses for home consumption. "Mixed farming system has helped me earn good returns to meet the marriage expenses of my daughters", adds Gangaiah with a smiling face.

One man mission

A farmer educator spreads agroecology

T M Radha

Knowledge on agroecology is constantly evolving on the field - and, farmer plays a key role in co-creation of knowledge as well as its dissemination. Here is a passionate teacher cum farmer who is motivating farmers to practice agroecology, using local platforms like farmer networks.

Pradeep Kumar is the Head master of a middle school in Guhalpur, a small village in Digapahandi block in Ganjam district in Orissa, since 16 years. Pradeep belongs to a farming family in Bhimapur and started his career as a development professional in an NGO called Gram Vikas. Pradeep with a deep commitment towards development, has been instrumental in bringing about a change in mindsets and fostering action, among the farmers and the students alike.

Spreading SRI, an agroecological practice

Pradeep Kumar having worked with rice farmers during his association with GramVikas, was aware of the problems in rice cultivation, which was primarily salinity in irrigated water. In 2000, he happened to read the article by Dr. Norman Uphoff in the December issue of 2000, in LEISA India. Excited about the idea, he shared it among his farmer friends in Guhalpur to try out SRI in their farms. Two farmers experimented with the idea and got good results.

In 2000-01, to facilitate fair distribution of water for irrigation for the rice farmers from Ghodohada dam, Pradeep motivated farmers to get organised into water groups called Pani Panchayat. Around 57 villages in the Digapahandi block were part of this group, with two representatives from each village. This group met once every month and discussed issues related to agriculture and also those related to overall



Photo: Author

Pradeep and Pani panchayat members work together in solving water based issues

village development. Many of the village level disputes were settled during the group meeting. Also being a farmer, Pradeep was a part of the group and played an influential role in the group. He being an educated person and the teacher, the local community has great respect for him.

In one of the meetings, Pradeep shared about SRI and how it helps in reducing resource use while enhancing yields. More importantly, as the main purpose of the water users group was to use water more efficiently, he stressed on the less water requirement for SRI, as a means to motivate farmers to adopt SRI. Around 200 farmers took up SRI initially. By 2003, around 1000 farmers in the block started adopting SRI on their farms.

Till 2005, SRI promotion was not on the agenda of the State department. There was no government support for SRI promotion and only few NGOs in the district like LIPICA and Gram Vikas were motivating farmers to adopt. Pradeep

also organized a couple of meetings in his school by inviting resources persons from the Rice Research Institute in Cuttack. Around 50 farmers participated. However, this could not be continued for long.

From 2005 onwards, his focus was on upscaling the initiative. Follow up was made during the monthly and bi-monthly meetings of the Pani panchayat at the block level. Success achieved, problems faced were all discussed at the meetings. The knowledge and skills that need to be upgraded were also identified. But unfortunately, the communities had no means of fulfilling this desire. The staff from agriculture department visited only when there was pressure from the members, but hardly advised on better practices in farming.

Presently, SRI is being promoted by the Department of agriculture and is a State level initiative. Pradeep was instrumental in motivating farmers to adopt SRI in Digapahandi block, much before the State started promoting it. *The government run training programmes on SRI are not adequate*, feels Pradeep. The programme took off slowly as farmers were slow to get convinced. After a number of exposure trips, farmers started adopting SRI. Pradeep interacted with SRI farmers in about 20 villages. Farmers expressed improvement in yields. Some got 20-25 quintals per acre while they were getting only 15-16 q/ac., earlier. Farmers found this method innovative and resource saving but were not sure whether they could follow on a large scale.

Moulding young minds towards agroecology

Pradeep has been instrumental in starting a kitchen garden in the school. The kitchen garden was started as a part of creating an activity based learning environment. Since most of the students come from poor farming families, children have a natural interest towards gardening. The kitchen garden is about 200 sq.mts. A number of vegetables like brinjal, drumstick, chillies, green leaves, papaya etc., are grown in the garden.

Pradeep with his awareness on ecofriendly cultivation has been promoting organic ways of cultivating these vegetables. A pit is made in the garden where compost is prepared using waste materials from the garden. Cowdung, neem leaves, deodar leaves etc are used for composting. Also has experimented with vermicomposting after reading about it in the magazine, but could not achieve great success.

In the beginning, the plants were affected by white ants and occasionally some diseases. *“Dr. Narayana Reddy’s column (a special column in LEISA India by an organic farmer) helped us a lot in addressing these problems”* says Pradeep. He further added that green manuring was resorted to and constant care and observation helped tide over many



Photo: Author

School students maintain kitchen gardens using ecofriendly methods

problems. He had also tried applying night soil to marigold plants based on Narayana Reddy’s experience.

Children have a special sharing class for an hour on every Saturday. The students are organized into ecoclubs in which they are exposed to environmental issues. Children share what they have been doing and also the problems in maintaining the kitchen gardens. The teachers advise them on necessary followup action. No special training is imparted to children on kitchen gardening.

Students are first generation literates, the practical training on kitchen gardens is not only joyful but also makes them aware and believe in environmental friendly activities.

The harvest from the kitchen garden is used in the preparation of mid day meals for the students. The students feel that the taste of vegetables they grow is much better than what they taste when they buy vegetables from outside. Children in turn go back home and discuss these with their parents.

Pradeep feels that *“doing is believing”* and as these students are first generation literates, the practical training on kitchen gardens and composting is not only joyful but facilitates independent thinking among children and also makes them aware and believe in environmental friendly activities. The joyful learning processes has ensured that students continue their education. *“There are no dropouts from the school, anymore”*, says Pradeep happily.

Sphere of influence

Pradeep has been active in interacting with farming communities through the Pani Panchayat, with school children and their parents (who are also farmers), and also has built strong linkages with the village level workers and the block level officers. Presently, Pradeep is the contact person for all the development activities at the block level. He discusses various issues especially creating awareness on the environmental aspects.

Pradeep has been able to influence a number of people in the society with his views. Starting from students in his school, it extends to the teachers who are presently working and those who have retired as well. For example, Mr. Kali Mishra, who hails from Sama Singi in Berhampur Gram Panchayat, is a teacher in this school who spreads the ideas back home. His close friends in two NGOs, for example, LIPICA in Berhampur and Jan Jagaran in Digapahandi block have spread his ideas. Infact, he is the resource person for the Kansamari farm of Jan Jagaran maintained by differently-abled persons. His strongest influence can be seen on the Pani Panchayat members whose membership includes 57 villages in the block. Besides, he actively engages with the eco-club students at the block level too.

Pradeep sphere of influence has been much wider, owing to the fact that his position as a school teacher and an active member of Pani Panchayat gives him opportunity to interact widely. More importantly, his personal qualities like his passion and dedication have played a great role. For instance, Pradeep is a key person in the village who is respected for his education and abilities. His passion towards development work, his prior experience in development organizations, his networking abilities and contact with the outside world has made him evolve into a person gaining lot of respect from the society. On the other hand, his position of being a

head master has given him an opportunity to mould the younger generation too. All these qualities have played an important role in spreading information on agroecology.

The case of Pradeep shows that even an individual can make a lot of difference to the society, if driven by passion. The power of information sharing comes out explicitly in this case. If information reaches the right person with passion, there is no limit to the impact that it can create. Even one person, one farmer or one educator can bring about a change in the society he lives.



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Joining hands to revive pastoral economy and its ecosystem

Ramesh Bhatti and Shouryamoy Das

A host of organizations have come together in helping the pastoralist community groups conserve the local buffalo breed and the ecosystem. The partnerships helped communities in gaining access to dairy markets that are remunerative. Now, they are also with the communities in ensuring them gain governance rights. The government, the major stakeholder, is yet to listen to them.

Banni has been home to *Maldharis* (as the community of pastoralists is known in Kutch) for almost more than 5 centuries now. Banni, once Asia's second largest grassland, was considered to be the finest of all grasslands in India. It expands across 2500 sq km and is home to a variety of flora and fauna. More than 7000 families live in Banni today, and most of them are maldharis. Maldharis used to have grazing rights on Banni during the rule of the king; the rights were conferred in lieu of payment of a grazing tax. Decisions on the utilization and management of the grassland used to be taken by leaders of the maldhari communities, and the community as a whole ensured that the norms were followed by all. These maldharis still hold documents dated back to 1856 that codified their rights on Banni during princely rule.

Banni was classified as a protected forest in the year 1955. No survey or settlement processes were carried out at that time. Since then, governance rights on the grassland have been ambiguous, while the Revenue department had transferred the administrative control to Forest department in 1998, Forest department refused to administer the land till survey of the villages located within Banni was completed. Since, neither the Forest department nor the Revenue department stepped in to take administrative control, the Maldharis, in spite of having no formal control, have continued to manage and govern the grassland in using their traditional systems. Banni *maldharis* have since become famous for their vigorous animals breeds, especially



Photo: Author

Traditionally, Bannis were maintained by Maldharis

the Banni Buffalo, a syncretic relationship with the ecosystem, and an elegant culture of *maldhariyat*.

Call for action

Things however were soon to change. And in 2008, the Banni *Pashu Mela*, an annual animal fair, which celebrates the breeds, culture, and human ecology of Banni became a platform to usher this change. The elders among the maldharis realized they needed to make concentrated efforts to augment the livelihoods of their community, work for recognition of the Banni buffalo breed, address the issue of the community's rights on the grassland, and develop plans to conserve the Banni grasslands (which was fast degrading due to the spread of an alien invasive species called *Prosopis Juliflora*). About 1200 maldharis came together to form Banni Breeders Association which was registered under Gujarat trust and society act as *Banni Pashu Uchherak Maldhari Sangathan* (BPUMS) in 2009 and started working to pursue the community objectives. BPUMS formalized its governance structure, and was to be managed by a 21 member Executive body elected for a term of three years. The executive body comprised of one representative from each of the 19 panchayats and two SC members. BPUMS joined hands with Sahjeevan, a local NGO, to register Banni Buffalo and with NDDB to revive the milk economy. They also started addressing the issue of conserving Banni through

traditional governance models and restoring their formal rights on the land by starting negotiations with the government.

Banni Buffalo – Gaining recognition

BPUMS, since then, has met with unqualified success in addressing the issue of livelihoods. Banni Buffalo has been bred and developed by pastoralists in Banni over generations. This breed has unique characteristics of such as drought resistance, disease resistance, high yields even under distressed conditions, calm demeanor, and ability to graze in the night by itself which makes it perfectly suited for an arid or semi-arid climate. BPUMS, with support from Shajeevan, Sardar Krishinagar Agricultural University (SDAU) and State department on Animal Husbandry got the breed registered in 2010. Registration has led to recognition for both the breed and the breeders. National Biodiversity Authority and Life Network awarded *Breed Savior* award to Haji Musa, a maldhari, and BPUMS jointly. Salemamad Halepotra, president of BPUMS, was appointed (and still continues to be) member of the management committee of NBAGR. Demand for Banni buffaloes increased and the average price of Banni buffaloes has more than doubled since its registration.

Banni Buffalo was the first buffalo breed to be recognized in India after independence and since then 29 new breeds of livestock has been registered by NBAGR.

Milk economy gets a boost

The pastoralists of Banni had been producing milk that far outstripped the local demand, and hence the prices remained depressed till 2008. Setting up a milk dairy to market milk outside of Kutch was the need of the hour, and BPUMS started discussions with NDDB. NDDB agreed and in close collaboration with BPUMS set up bulk milk cooling centers in villages of Banni. As a result, the price of milk has tripled in the last decade. This has also led to an increased production of milk. Now Banni produces more than 100,000 liters of milk daily, up from 60,000 liters in 2008. Today the size of the livestock economy stands at an estimated INR 110 crores per year.

Reviving traditional governance systems

Forested landscapes in India have been contested for long and this contest has intensified in the recent decades. Forested lands that have been indispensable to survival of indigenous people and local communities have been taken over unilaterally by the state on the pretext of conservation. This has seen enclosure of commons and rights of the local communities on these resources have been often been

curtailed or negated. Indigenous peoples and local communities, often with the support of civil society organisations, withstood appropriation of community resources and have tried to regain rights and ownership over commons and community resources. These efforts led to enactment of Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 (FRA). FRA recognized the rights of local communities on their ancestral lands, community forest resources, and customary territories. Unfortunately, the implementation of the FRA has met with roadblocks placed by groups and individuals with vested interests. As a result FRA has had limited success in achieving its objectives of securing livelihoods, enhancing forest conservation, strengthening local self-governance, and opening political space since its enforcement.

The situation in Gujarat (and in Kutch) has been no different. BPUMS's consultation with the government for formalization of their rights has proved to be a much more arduous climb; and one that is still to reach its destination. BPUMS started off by first documenting its community rights and ways in a BCP developed under article 8j of Nagoya Protocol. In the year 2009, the Forest department came up with a working plan to fence large areas of Banni. This working plan, developed without consulting the community, proposed not only to cut pastoralists' access to a number of wetlands within Banni, but also turned a blind eye to the pastoralist's need to move across ecosystems in a single calendar year. Banni Breeders' association decided to ask for their community rights instead, since it was evident that the implementation of the working plan would have been a threat to the ecosystem that sustained them. This in turn would have impacted their own livelihood, breeds, and culture.

The breeders' association also realized that FRA could be instrumental in formalizing their rights on grassland of Banni, and it was an opportunity to start reviving traditional governance systems while a struggle for their rights ensued. BPUMS anchored a signature campaign across all the 54 villages across Banni. This campaign, now famous as "*Banni Ko Banni Rahene Do*" meant 'let Banni remain as commons' and worked to reestablish the way the grassland had been utilized traditionally, conserved, and managed by

With bulk milk cooling centers in villages of Banni, the production has increased to 100,000 liters of milk daily, with the livestock estimated economy being at INR 110 crore per year.



Photo: Author

Banni Buffalo is bred and developed by pastoralists in Banni over generations

pastoralists. BPUMS organized numerous meetings in villages and Panchayats and decided to collectively show their disapproval, spread awareness about their rights, and started urging the state government to implement the FRA in the Banni at the earliest. Elders of the Maldhari communities and BPUMS representatives engaged in a series of consultations with the Minister of Tribal Affairs and Ministry of Environment and Forests. The Ministry of Tribal Affairs informed the representatives that while implementation of FRA has been started in the state, it was yet to be done in Kutch, since the nodal agency for implementation of FRA in non-scheduled areas (such as Kutch with its low tribal population) was yet to be finalized. In 2012, implementation of Working Plan was initiated by the forest department. Maldharis responded by organizing a rally in Bhuj and submitted a memorandum to the Collector of Kutch, informing him and the State Level Monitoring Committee that as long as their rights remain unrecognized under FRA, they would continue to resist peacefully. On 5th June 2012, BPUMS invited the media to demonstrate their way of managing grassland and solicited media's support for the struggle.

Negotiating with the State

At BPUMS's behest, the gram sabhas in Banni started forming Forest rights committees (FRC) in each village and started claiming their rights on Banni. These efforts led to a notification by Government of Gujarat and letters were sent to Collectors of all non-scheduled districts of the state directing them to implement FRA. The district administration then formally summoned Gram Sabhas to form Forest Rights Committees (FRCs) in each village. Resource mapping plan was developed using participatory exercises that studied the traditional grazing practices, biophysical conditions, dependency of livestock, and existing

faunal and floral biodiversity. These community claims were approved by SDLCs while the DLC agreed to them in principle. Out of the 54 FRCs that were formed, 48 of them decided to file for common rights to Banni. This was a remarkable achievement for BPUMS, since this reflected a pastoralist's need for access to regions across Banni. This was also the first time that such a large community had come together to submit common claims over a whole forest.

BPUMS, since then, has also started working with renowned research institutions such as ATREE, NCBS, and Ambedkar University to set up RAMBLE (Research and Monitoring in Banni Landscape) an institution committed to study the grassland and provide research-backed inputs on its conservation and management.

The efforts of Banni Maldharis had not only opened the gates for their claims to be formalized, but also of the other communities that lived off commons in non-scheduled areas districts of Gujarat and needed the support of FRA to establish their rights. Efforts to formalize community rights on Banni are still ongoing, and BPUMS is negotiating with the District Collector of Bhuj and the Chief Minister of Gujarat now. This journey has been marked by trials and tribulations, and the collective strength of the maldharis dealt with all of them till now. Banni Maldharis are the only pastoralist group in India that has been able to mount a stake for their common rights. Notably, Banni is also the largest grassland area on which land rights are being negotiated between the community and the government. Commons in India have long witnessed degradation due to an absence of governance or misgovernance. Maldharis, through BPUMS, have proposed a system to resolve this, a system that can be replicated across the country. Recognition of their rights will be a landmark achievement not just for pastoralists of India, but also for the democracy of India. We can only hope that recognition of rights on Banni will inspire other pastoral communities in India to follow suit and start registering their claims in their communal lands.

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Forgotten Agricultural Heritage

Reconnecting food systems and sustainable development

Parviz Koochafkan, Miguel A. Altieri, 2017, *Routledge*, 272 p., £32.99, ISBN: 9781138204157,

Contemporary agriculture is often criticized for its industrial scale, adverse effects on nutrition, rural employment and the environment, and its disconnectedness from nature and culture. Yet there are many examples of traditional smaller scale systems that have survived the test of time and provide more sustainable solutions while still maintaining food security in an era of climate change. This book provides a unique compilation of this forgotten agricultural heritage and is based on objective scientific evaluation and evidence of the value of these systems for present and future generations.

The authors refer to many of these systems as Globally Important Agricultural Heritage Systems (GIAHS) and show how they are related to the concepts of heritage and the World Heritage Convention. They demonstrate how GIAHS based on family farms, traditional indigenous knowledge and agroecological principles can contribute to food and nutrition security and the maintenance of agro-biodiversity and environmental resilience, as well as sustain local cultures, economies and societies.

Two substantial chapters are devoted to descriptions and assessments of some 50 examples of designated and potential GIAHS from around the world. The book concludes by providing policy and technical solutions for sustainable agriculture and rural development through the enhancement of these systems.

Climate Change and Agricultural Development

Improving Resilience through Climate Smart Agriculture, Agroecology and Conservation

Udaya Sekhar Nagothu (Ed.), 2016, *Routledge*, 322 p., £85.00, ISBN: 9781138922273

Two of the greatest current challenges are climate change (and variability) and food security. Feeding nine billion people by 2050 will require major efforts aimed at climate change adaptation and mitigation. One approach to agriculture has recently been captured by the widely adopted term of “Climate Smart Agriculture” (CSA). This book not only explains what this entails, but also presents practical on-the-ground studies of practices and innovations in agriculture across a broader spectrum, including agroecology and conservation agriculture, in less developed countries.

It is shown that CSA is not a completely new science and a number of its recommended technologies have been used for some time by local farmers all over the world. What is relevant and new is ‘the approach’ to exploit their adaptation and mitigation potential. However, a major limitation is the lack of evidence-based knowledge that is necessary for policy makers to prepare strategies for adaptation and mitigation. This book assembles knowledge of CSA, agroecology and conservation agriculture, and perspectives from different regions of the world, to build resilient food systems.

2016- The State Of Food and Agriculture

Climate Change, Agriculture And Food Security

Food and Agriculture Organization, Rome, 2016, 190 p.

The 2016 SOFA report presents evidence on today and tomorrow’s impact of climate change on agriculture and food systems. The report assesses the options to make agriculture and food systems resilient to climate change impacts, while minimizing environmental impacts. It shows that making agriculture and food systems sustainable is both economically and technically feasible. However barriers to the adoption of appropriate technologies and management practices will have to be lowered, especially for smallholder farmers and women farmers amongst them. Likewise, an overhaul is needed of agricultural and food policies to shift incentives in favour of investments, worldwide, in sustainable technologies and practices.





Multi-Stakeholder Platforms for Integrated Water Management

Jeroen Warner, 2007, Routledge, 298 p., £34.99, ISBN: 9781138266148

As they provide a negotiating space for a diversity of interests, Multi-Stakeholder Platforms (MSPs) are an increasingly popular mode of involving civil society in resource management decisions. This book focuses on water management to take a positive, if critical, look at this phenomenon. Illustrated by a wide geographical range of case studies from both developed and developing worlds, it recognizes that MSPs will neither automatically break down divides nor bring actors to the table on an equal footing, and argues that MSPs may in some cases do more harm than good. The volume then examines how MSPs can make a difference and how they might successfully co-opt the public, private and civil-society sectors. The book highlights the particular difficulties of MSPs when dealing with integrated water management programmes, explaining how MSPs are most successful at a less complex and more local level. It finally questions whether MSPs are - or can be - sustainable, and puts forward suggestions for improving their durability.

A Stakeholder Approach to Managing Food

Local, National, and Global Issues

Adam Lindgreen, Martin K. Hingley, Robert J. Angell, Juliet Memery (Eds.), 2017, Routledge, 332 p.

This research anthology explores the concept of food production and supply, from farm gate to plate, bringing together contemporary thinking and research on local, national, and global issues from a stakeholder perspective.

A Stakeholder Approach to Managing Food includes a number of sections to represent these challenges, opportunities, conflicts, and cohesions affecting relevant stakeholder groups within food production and supply and their reaction to, engagement with, and co-creation of the food environment. With an in-depth analysis of agricultural businesses, this book shows that the entrepreneurial spirit is alive and well in rural communities with often renewed and engaged connection with consumers and imaginative use of new media.

This book will be of interest to students, researchers and policy-makers concerned with agriculture, food production and economics, cultural studies.

Stakeholder Engagement for Inclusive Water Governance

OECD Studies on Water

OECD, 2015, OECD Publishing, 276 p., €8, E-book, ISBN: 9789264231122

This report assesses the current trends, drivers, obstacles, mechanisms, impacts, costs and benefits of stakeholder engagement in the water sector. It builds on empirical data collected through an extensive survey across 215 stakeholders, within and outside the water sector, and 69 case studies collected worldwide. It highlights the increasing importance of stakeholder engagement in the water sector as a principle of good governance and the need for better understanding of the pressing and emerging issues related to stakeholder engagement. These include: the shift of power across stakeholders; the arrival of new entrants that ought to be considered; the external and internal drivers that have triggered engagement processes; innovative tools that have emerged to manage the interface between multiple players, and types of costs and benefits incurred by engagement at policy and project levels. This report provides pragmatic policy guidance to decision makers and practitioners in the form of key principles and a Checklist for Public Action with indicators, international references and self-assessment questions, which together can help policy makers to set up the appropriate framework conditions needed to yield the short and long-term benefits of stakeholder engagement.

Institutions come together in promoting organic farming

S Vallal Kannan, P Ananda Priya and P Tamilselvi

Mainstream agriculture institutions through collaborative initiatives are playing a role in promoting organic agriculture. Krishi Vigyan Kendra in Karur with its multi institutional approach helped farmers in Karur district to switch over to organic ways of farming, in turn helping them increase their net incomes and farm employment, besides building self reliance.

Even though India has vast potential for organic production and marketing, its achievement on production, certification and export is low due to various reasons. Lack of sufficient education on production with specific standards, lack of easy accessible information on organic methods, requirements and markets for interested farmers, lack of good consumer information on organic farming and organic food, high distribution costs, lack of effective documentation and dissemination of research results among farmers and advisors, insufficient practical orientation of research etc., are some among them.

During a PRA and focus group discussions, Krishi Vigyan Kendra (KVK) in Karur identified the problems faced by the organic growers of Karur district, such as low productivity, improper recycling of farm wastes, low remunerative price, lack of markets, lack of information and knowledge on organic agriculture etc. To promote organic farming, to increase the productivity and to help small holders in group certification, KVK Karur started working with the farmers in the region.

The villages were grouped into clusters based on close geographical proximity and uniformity in farming system. About 4 clusters were formed covering 63 groups. Major crops grown in these clusters are paddy, sugarcane, banana, groundnut, and millets and horticultural crops like vegetables, tapioca and banana.



Photo: Author

Exhibition of organic products and technologies

Institutional Approach

KVK Karur has been promoting organic farming in the district through Institutional Approach. It worked with State Agriculture Universities (SAUs) and Research Stations for information on production aspects, National Center on Organic Farming (NCOF) for financial support, APEDA for standards and quality control, marketing institutions for marketing information and procurement and dissemination of technology and with peoples institutions at the cluster level. Each institution had a specific role to play.

Capacity building

Trainings and demonstrations were organized for knowledge and skill up gradation. Trainings were imparted to farmers on organic farming with various topics like soil fertility management, principles and practices of organic farming, organic input production technologies, use of natural resources and ITK, documentation in organic farming and

certification, post harvest techniques etc., both at farmer's field and in KVK campus. During 2006-08, around 3402 farmers were trained by KVK.

Demonstrations were conducted on the use of bioinputs and use of biogas slurry. Demonstration on use of bio inputs was done with the financial support of NCOF, Ghaziabad. Three demonstrations were conducted in paddy, bhendi and banana in the villages of Vadaseri, Archampatty and Muthalaipatty respectively on bio inputs. It had created confidence among the farmers on organic production technologies and other fellow farmers have accepted to adopt these technologies on trial basis in minimum area. The inputs namely bio-fertilizers and bio pesticides, (*Azospirillum*, *Phosphobacteria*, *Pseudomonas* & *Trichoderma*), bio control agents (*Trichogramma japonicum*, *Trichogramma Chilonis*), green manures (Sunhemp, Daincha, Calotropis, Avarai, Kolinji) and animal based manures and growth promoters (Panchakavya, Amirthapani, Vermicompost, vermiwash, fish amino acids, fruits extracts), traps, botanicals and various enriched manures were supplied to farmers.

Importance of enriched biogas slurry was demonstrated at five locations in the crops viz., sesame, sunflower and groundnut. Biogas slurry was enriched with nitrogen fixing and nutrient solubilizing bacteria and fungi and this technology and its usage were demonstrated in addition to the use of various organic inputs. Pulutheri, Seethapatti, Vadasery, Tharagampatti and R.T. Malai from Kulithalai and Kadavur blocks farmers were involved in these demonstrations.

Wider awareness

Exhibitions, mass media programmes and exposure visits were organized to create awareness on a larger scale. More than 760 farmers were exposed to organic farming concepts by organising around 14 visits during 2006 to 2008. Around 21 exhibitions were organized at various locations during 2006-2008 and nearly 20000 farmers, farm women, rural youth and extension functionaries have participated. Through these exhibitions, awareness on organic farming and its importance was created widely among the farming community of Karur and nearby districts and also developed excellent network among the organic growers and between organic growers and consumers of organic produce.

Similarly, mass media like TV, radio and newspapers were utilized for wider reach. Several publications in the form of folders, booklets and manuals were brought out. Quarterly newsletters "Organic renaissance" were published to share latest updates and trends in organic farming.

An impact study conducted with sample farmers indicated that, by 2008, around 83% of the respondents had high level of knowledge on organic farming in all aspects like principles of organic farming, soil fertility improvement, land selection for organic farming, pest and disease management, post harvest technologies and documentation and certification process etc. This is almost double when compared to the figures of 2005, wherein only 42% of the respondents had high knowledge levels. This can be attributed to more number of trainings, demonstrations and extension activities organized by the KVK at regular intervals.

Farmers as technocrats adopting organic farming practices

Majority of the respondents (85%) were found to adopt the organic farming practices in scientific manner -from field selection to harvest and marketing. Around 96 organic growers group were organized – 27 in 2006, 47 in 2007 and 22 in 2008. There were around 1930 organic farmers registered in these groups. In each group a leader was identified on consensus mode and they were trained on organic farming in standards for organic cultivation, documentation and procedure for certification and marketing. By this way the group leaders emerged as technocrats and disseminated the technology. They were also responsible for documentation and maintenance of the standards. During 2006, four organic growers started serving as technocrats, which further increased to 17 in 2007 and 53 in 2008. With technocrats, technology spread was high. Belonging to the local area, their acceptance and credibility were high.

The registered farmers allotted specific area for organic farming. In these small areas they started implementing organic practices with the support of KVK. In 2006, 116.82 hectares were under organic farming cultivated by 532 registered farmers. The crops grown were paddy, banana, sesame, sunflower, groundnut, green gram and black gram etc. In 2007, the area under organic farming increased to 269.63 hectares.

Increasing self reliance

Most of the organic inputs were produced locally reducing dependence on external inputs. The most widely used organic

To create awareness among consumers, exhibitions were organized at different places. Also an excellent network for marketing of organic produce was established with the market promoters.

manure is vermi compost. Totally 44 farmers in the operational area started vermi compost production units. Vermicompost produced was used on their own fields and the surplus was sold to others in the village. The remaining farmers used farm yard manures, enriched farm yard manures with bio fertilizers for basal application. The total production capacity of the 44 vermi compost production is 399 tonnes per year.

Majority of the farmers prepared *Panchagavya* and Insect repellents whenever they needed. To supplement the organic input requirements, 18 units to produce *Panchagavya* and insect repellents were established during 2006 and the same had increased upto 56 during 2008 for large scale production.

Use of organic inputs reduced the input cost while the organically grown produce fetched additional price, leading to additional net income of about Rs. 1130, Rs 1250 and Rs. 1820/ha during 2006, 2007 and 2008 respectively. Establishment of various organic production units created additional employment opportunities of around 142, 198 and 210 man days during 2006, 2007 and 2008 respectively.

Linking producers and consumers

Consequent to increase in area under organic farming, the availability of the organic products in Karur district, also increased. To create awareness among consumers, exhibitions were organized at different places. Also an excellent network for marketing of organic produce was established with the market promoters. KVK also participated in various exhibitions both at the state and at the national level and created special market for organic sesame. With the support of KVK, processing units for organic sesame and organic rice were also established. Through certified processing units, the availability of processed products increased in the district.

Conclusion

Krishi Vigyan Kendras are established to serve as Knowledge and Resource Centres for improving the agricultural economy of the district by linking the national research with extension system and farmers. Through their interventions, KVK Karur has played its role by helping farmers to switch over to eco-friendly organic practices. This was possible owing to their multi agency approach involving



Photo: Author

Organic input production unit

various institutions like State Agricultural University (SAU), National Centre for Organic Farming (NCOF), Agricultural and Processed Food Products Export Development Authority (APEDA), Processing Institutes etc. Farmers in the region are now better equipped to adopt organic way of farming, which is more remunerative and less dependent on external inputs.

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Women trying out use of tabs

Partnerships promoting digital platforms

Amit Chakravarty

Over the last few decades massive technological development and new opportunities have transformed people's lives. However, these opportunities have not benefited the agriculture sector in a significant way. Access to timely and relevant information can benefit all stakeholders in the agriculture ecosystem. Information and Communication Technologies (ICTs) will play a key role in knowledge exchange, targeted recommendations, market integration and access to finance to make agriculture a profitable enterprise.

Agricultural production issues cannot be considered in isolation from environmental issues. The use of digital tools in agriculture helps the diverse set of stakeholders in any given context to meet the competing demands of increased production, ecological sustainability, food security, economic viability, resource conservation and social equity. Use of modern ICT tools in agriculture help reduce transaction costs; improve market transparency; promote efficient logistics and provide financial inclusion and insurance. Tools ranging from data analytics and remote sensing to information delivery through mobile phones helps stakeholders coordinate and improve efficiencies across the value chain. This enables every actor in the value chain deliver the goods and services required by the other actors, thus acting in unison to promote agroecology. Timely information helps stakeholders act in a concerted manner to create a win-win situation for all.

India has a long history of use of ICTs for agriculture. Some of the early pioneers were Wana Wired village (launched in 1998), Gyandoot (launched in 2000), Nokia Life (launched in 2009), Reuters Market Light (launched in 2007), e-Sagu (launched in 2004), e-Krishi, e-Choupal, iKisan. Initiatives like Gyandoot, Wana Wired Village and Nokia Life were not limited to agriculture. They also provided information on other aspects like education, health, entertainment, provision of government services like birth/death certificates, copies of land titles, information on government schemes, government subsidies, and a variety of other information and services. The other initiatives mentioned above are more focused on providing information and services related to agriculture only. There is a mix of government-led projects, non-government organization (NGO)-led projects, as well as private sector driven projects. In terms of information delivery channels, the primary channels are: (i) operator-mediated computer kiosk; (ii) telephony (call centers and mobile phones); (iii) web portals and (iv) different combinations of first three channels.

One of the primary premises behind the use of ICT in agriculture is that lack of information is a major impediment to improving farmers' livelihoods. Hence the deployment of early generation ICTs has been primarily for information dissemination. However, today we have at our disposal tools for (a) capturing and processing large amounts of data; (b) analytics tools and decision support systems; (c) systems that can be operated and monitored remotely.

ICRISAT has been continuously innovating in working with smallholder farmers to meet the contemporary challenges of agriculture. These challenges have evolved from the merely technical to also include social, cultural, economic and particularly environmental concerns. Using new tools like drones, ICRISAT has innovated beyond the traditional use of ICTs for information delivery. Described below are some of our initiatives that use modern tools as well as traditional ones to enable all stakeholders work in concert to improve the lives of smallholder farmers across sub-Saharan Africa and Asia.

A woman trains others in the use of digital tools



Photo: Author



Photo: Author

Men using mobiles to access information

Data analytics and business intelligence to empower farmers

A new sowing application for farmers combined with a Personalized Village Advisory Dashboard will help farmers pick the right sowing time, thus helping them avoid uncertainty due to climate change. This is being piloted in Andhra Pradesh. The sowing app will help farmers achieve optimal harvests by advising on the best time to sow crops depending on weather conditions, soil and other indicators.

The sowing application utilizes powerful artificial intelligence to interface with weather forecasting models provided by USA based aWhere Inc. and extensive data including rainfall over the last 45 years as well as 10 years of groundnut sowing progress data for Kurnool district. This data is then downscaled to build predictability and guide farmers to pick the ideal sowing week. When combined with other data collected from, it can create rich datasets that can be processed to build predictive models for the farmers.

Similarly, the Personalized Village Advisory Dashboard provides an instant overview across several environmental factors that determine a healthy crop yield. In a pilot that is currently in progress, information will be sent to farmers about the sowing date via SMS in Telugu. Data collected manually from 10000 hectares each in the 13 districts of the state by ICRISAT field officers has been uploaded to Microsoft's Azure Cloud.

The use of advanced analytics in agriculture will help streamline and strengthen farming practices. The Sowing App and Personalized Village Advisory Dashboard provide powerful cloud-based predictive analytics to empower

farmers with crucial information and insights to help reduce crop failures and increase yield, in turn, reducing stress and generating better income. It has been developed through a partnership between Andhra Pradesh government, Microsoft, aWhere, and ICRISAT under the Rythu Kosam project funded by the Government of Andhra Pradesh. A local grassroots organisation, Chaitanya Youth Association, working in Kurnool, is supporting this initiative in the field.

On the ground

Shivappa is one angry farmer. *"How come I don't get any messages that the others are getting,"* he protested vehemently when the ICRISAT team visited his village. So did Yusuf Basha and Madanna Kandappa of Kurnool district of Andhra Pradesh, India.

Since 15 June farmers of Devanakonda village in Kurnool have been getting advisories as text messages on their mobile phones informing them the right time to sow and the preparations needed before sowing. Currently 175 farmers, out of around 1,000 farmers, are receiving these advisories informing them the best time to sow depending on weather conditions, the crops they grow, soil health and other indicators.

Farmers in Devanakonda and surrounding villages are primarily dependent on rains for farming. Around 60% of the cultivated area is under groundnut followed by cotton (22%) and castor (17%). Other crops grown are pigeonpea, chillies and vegetables.

The advisories, for groundnut production, are sent in the local language Telugu as well as English. Many farmers own first generation feature phones which may not support the local language, hence messages are also sent in English. To overcome the literacy barrier, some designated farmers are given the responsibility of conveying the message to others and the possibility of sending voice messages is being explored.

Sample text message sent on 27 June

1. Sowing rainfed groundnut crop can be initiated
2. Before sowing, seed treatment is essential
3. Prevention of seed and soil borne diseases is very important
4. Treat one kg seed with 3g of Thiram or Captan or Mancozeb
5. Wherever white grubs are problematic, treat one kg seed with 6.5 ml Chlorpyrifos before sowing
6. While sowing, ensure optimum soil moisture
7. Place the seeds at a depth of about 5 cm in the soil



Photo: Author

Rameshwaramma in her groundnut fields

Ms. Rameshwaramma is very happy with the advisory service. She planted groundnut in 1.5 ha and followed all advice such as gypsum application, opening up furrows for moisture conservation, intercropping with pigeonpea and micronutrient application. Today she has a healthy crop to show for her efforts.

Many farmers like Shivappa who were not subscribing to the messages earlier are now eager to sign up, seeing how their neighbours have benefited. Tracking the farmers shows that from 24 June when the farmers were advised to start sowing, the percentage of area sown went up from 15% to 100% by 4 July.

Conclusion

This initiative brings together a cross-section of stakeholders on a common platform to empower smallholder farmers. In the face of climate change, helping farmers reduce risk by empowering them with information to take the right decisions, introducing crop diversity in farming systems as a risk mitigating measure, introducing tools and technologies for climate-smart agriculture require diverse stakeholders – farmers, research institutes, government, NGOs and the corporate sector – to come together and work in a coordinated manner to make agriculture profitable and sustainable.

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