THE NEW COMMONS IN AGRICULTURE: LESSONS FROM THE MARGINS AND SRI IN INDIA

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Abstract — With increasing evidence of the unfavourable ecological footprint of the industrial-agricultural paradigm, ominous climate changes, and embarrassing social and economic crises in India manifested in farmer suicides over the last decade, there is an urgent need for India's agricultural research system to give more attention to sustainability as well as equity in innovation systems. This requires openness to acknowledging past failures and a willingness to reconfigure the research system's relations with non-research actors. This paper looks at possible lessons to guide this reconfiguration by examining the rapid and surprising spread of a novel sustainable innovation in India – the System of Rice Intensification (SRI).

SRI shows how a less hierarchical and less linear architecture of innovation has enabled a new 'knowledge commons' to emerge in Indian agriculture, contributing substantially to household-level food security, also enabling farmers to cope with vulnerabilities. Open innovation in SRI has enabled the creation of this new commons in an era when privatization of agricultural knowledge has gained sway. Rainfed areas that have been marginal to the Green Revolution are becoming more central to the establishment of sustainability regimes. This innovation has been enabled by the extensive use of the internet, based on new kinds of networking within civil society playing an important role ensuring collaboration among diverse actors from the farm to the national level. The paper highlights the importance of facilitating knowledge dialogues, learning alliances and innovation networks to enhance innovation capacities. 'Open innovation' and the new 'commons' have important policy implications for the future of innovation systems and sustainable development.

Key words: New commons, agroecological innovations, open innovation, learning alliances, vulnerability

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1. AGRICULTURAL VULNERABILITY AND COPING WITH COMPLEXITY

Even as India seeks to export Green Revolution ideas to Africa, agriculture in India is beset with multi-dimensional stresses. This has been most harshly revealed by unprecedented levels of farmers' suicides, over 200,000 during the last decade. Short-term measures, including palliatives such as loan waivers for large farmers and greater credit provision in recent times, have ignored the need to address more systemic issues relating to the unsustainability of current-day farming systems in economic and ecological terms.

India's complacency of being a food-secure, food-surplus state has been shown to be extremely vulnerable due to the drought this past agricultural season. Declining ground water levels, high input costs, and stagnating yields have already made agriculture unviable in many places. Sustaining input-intensive chemical agriculture is costly with the Indian government's having to deal with a four to six-fold increase in fertilizer subsidy in the last decade. Shortage and unequal access has led to shortages and though the recent budget has proposed a shift towards a nutrient-based subsidy regime for fertilisers with a view to improve efficiency of fertiliser use, much needs to be done to enable support structures and incentives for sustainable agriculture practices by many farmers, especially in the rainfed areas for whom the fruits of Green Revolution continue to seem like a mirage.

This paper argues that answers to the multifaceted crisis in agriculture in India and the world, especially in the light of the increasing ecological footprint of agriculture, are unlikely to emerge from minor tinkering with existing research strategies or blaming extension services for farmers' non-adoption of technologies. It requires a shift in technological focus from the current over-reliance on modifications in genetic potentials and the application of synthetic inputs following the Green Revolution strategy, to looking at alternate agroecological innovations that emphasise sustainability through an appreciation and understanding of plant-soil-environment relations and synergies arising out of these. Second, the technical management of these relations needs to go along with similar open interactions among research and non-research actors tapping into the potential of multiple sources of innovation and with learning together to deal with complexity.

There appear to be promising agroecological alternatives such as the System of Rice Intensification (known as SRI) spreading at the same time as the agricultural crisis is widening. These innovations at the margins have largely been led by civil society organizations, farmers and a handful of agricultural scientists who have not been constrained by linear views of research and extension.

Small and marginal farmers have taken to SRI enthusiastically in many parts of India and have seen in SRI an opportunity to overcome local-level food security problems, and even to cope with drought, while many extension systems in typical Green Revolution areas have faced difficulties in taking SRI forward. In an important extension to the innovation, SRI principles have been extended to other crops such as wheat, finger millet, maize and kidney beans. This paper draws insights on innovation and sustainable development by tracing the evolution of SRI in India over the last decade. It highlights the emergence of a new 'commons' in agriculture that has made this transition to a potential sustainable regime.

2. SRI AS AN AGROECOLOGICAL INNOVATION

Rice is an important food crop now grown on about 250 million farms in 112 countries. Over 90% of the crop is grown and consumed in Asia. Between 2001 and 2007, global rice prices nearly doubled, primarily because of a drawing down of stocks to fill the gap caused by stagnating yields while population continues to grow. Rice cultivation is a very water-intensive activity, and it is estimated that irrigated rice receives 34-43% of the world's irrigation water, or two or three times more water than other irrigated crops. One of the ways of producing 'more crop per drop' has been the conventional emphasis on improved varieties such as the work on 'Super Rice' started in China that has been on at the International Rice Research Institute (IRRI) for over a decade. Separate or parallel from this approach has been the civil-society innovation of SRI which has worked not on improving rice genotypes but on producing better phenotypes through alternative management practices (Gujja and Thiyagarajan 2009).

The System of Rice Intensification, or SRI, is a set of ideas and insights that originated in Madagascar through the systematic experimentation by a French priest who put together six principles of improving rice productivity without dependent on changes or improvements in variety. This system has spread rapidly across the world since 1999 when it first moved out of Africa and is now demonstrated in over forty countries by over a million farmers. By creating a better growing environment (both above and below ground), SRI improves yields, enhances soil health, and reduces the need for inputs (seeds, water, labour). SRI is a technique of growing more rice with less inputs; a counter-intuitive set of six principles. SRI does not depend on introducing improved varieties and can work for any variety that a farmer uses, thus enhancing choice for farmers and reducing their vulnerability.

The main differences between conventional rice and SRI practice are summarised below in Table 1.

Table 1: Comparisons and Contrasts between Conventional and SRI Rice-Growing Practices

Conventional practices	SRI recommended practices
Transplanting 3-4 weeks old seedlings	Young seedlings (8-12 days) transplanted carefully
Plant 3-4 (6-8 even) seedlings together	Plant single seedlings
Closely spaced (10-15 cm apart) in rows	Widely spaced (20-30 cms) in a square pattern
Paddy fields continuously flooded, with 5-10 cm of water	Irrigate intermittently; maintain 1-2 cm of water on fields after the plants flower
Weeds controlled by flooding, supplemented by manual weeding or by herbicide applications	Use of simple implement (rotary hoe or cono-weeder) that aerates the soil while it removes weeds
Apply chemical fertilizer for 'force-feeding' plants	As much organic fertilization as possible; 'feed the soil organically, so that the soil can feed the plant'

A rough global estimate indicates that SRI methods are seen to have the following impacts compared to their conventional counterparts:

- Depending on current yield levels, *output per hectare* is increased usually by 50% or more, with increases of at least 20%, and sometimes 200% or more.
- Since SRI fields are not kept continuously flooded, *water requirements* are reduced, generally by 25-50%.

- The system does not require purchase of new varieties of seed, chemical fertilizer, or agrochemical inputs, although commercial inputs can be used with SRI methods.
- The minimal capital costs make SRI methods *more accessible to poor farmers*, who do not need to borrow money or go into debt, unlike many other innovations.
- *Costs of production* are usually reduced, usually by 10-20%, although this percentage varies according to the input-intensity of farmers' current production.
- With increased output and reduced costs, *farmers' net income* is increased by more than their augmentation of yield. (Uphoff and Kassam 2008).

In India some additional benefits of SRI include lesser lodging when the crop is subjected to storm forces, lesser incidence of pest and disease damage, and often less rat damage. The grain quality has been superior in most cases. Instances of water conflicts in utilizing ground water have been avoided, and farmers are now adopting water management recommendations more enthusiastically, having seen savings in diesel or electricity for pumped water wherever applicable.

The benefits for small and marginal farmers have been immense. They have been able to manage their crop with family labour only and hence have taken to SRI enthusiastically. SRI has empowered women in many places by reducing transplanting drudgery and time required, men often take over weeding once it is 'mechanized,' and women have often taken the lead in SRI extension with many instances of grouping of assets leading to debt repayment. Though yet to be quantified rigorously, there is evidence of food security for poor households in tribal areas increasing through SRI, from 3-4 months of household staple food supply to 6-9 months. This remarkable success of SRI worldwide has been achieved with little donor support and largely through farmer-to-farmer extension, and despite opposition in some scientific circles about the efficacy of its methods (Shambu Prasad 2006).

3. CIVIL SOCIETY AND EVOLUTION OF SRI IN INDIA

The spread of SRI in India is dynamic, complex and unconventional. India has one of the world's largest pools of agricultural scientists, yet the spread of SRI has been made possible mostly by active involvement of civil society organisations (CSOs) and farmers who proved SRI in the field, assisted by a handful of researchers who were willing to back their experiments and individual assessments. In this process, there have been several surprises. Despite a slow start, with poor representation and less than spectacular results to report at the first international SRI conference in China in 2002, India is in many ways leading the SRI movement today. In many states, Departments of Irrigation, Rural Development, Women and Child Welfare have become pro-active and successful in taking SRI forward, while the Department of Agriculture has been insular. Some smaller states such as Tripura, Uttarakhand, Himachal Pradesh, Bihar, Orissa, etc, that lost their competitive advantage in rice production following the Green Revolution that ignored them, have been showing some of the highest potential in SRI cultivation. Small, marginal and tribal farmers, often illiterate, who have often been dismissed as non-progressive, have been leading SRI spread in different states.

SRI can be found now in all the rice-growing states and agro-climatic zones of the country. A conservative estimate of the number of farmers practising SRI would be well above 250,000 in over 250 districts where rice is grown. Table 2 shows an estimate of the outreach or spread of SRI through civil society organisations. Few states have comprehensive figures on SRI spread with SRI practice being carried out by more than one organisation and network. The Sir Dorabji Tata Trust (SDTT), a private Indian donor agency, has the largest spread of 150 partners across 10 states for which detailed figures are available. Note that two states, Tamil Nadu and Tripura, have integrated SRI into their agricultural extension strategies, and

their scale of activity is not included in the table below. The SRI area in 2009-10 in Tamil Nadu (TN) is reported by the state government to be 650,000 hectares. Tripura reports that over 250,000 farmers were using SRI methods last year.

Table 2: SRI INDIA CIVIL SOCIETY ORGANISATIONS SUMMARY 2009-2010

S. No	State	Farmers	Area in Ha
1	Bihar	34,358	1,938
2	Orissa	17,093	3,740
3	Uttarakhand	9,330	352
4	W Bengal	5,863	508
5	Madhya Pradesh	4,648	1,203
6	Gujarat	4,000	1,240
7	Chhattisgarh	3,993	781
8	Himachal Pradesh	3,782	140
9	Jharkhand	3,042	443
10	Andhra Pradesh	2,354	1,590
11	Maharashtra	2,093	185
12	Assam	951	191
13	Karnataka	600	NA
14	Tamilnadu	300	207
15	Manipur	220	22
16	Uttar Pradesh	----	20
	Total	**92,627**	**12,560**

Source: Complied by authors. Presentation made to the National Food Security Mission (NFSM) 10th April, 2010.

These figures are impressive as state policy has been slow to catch up with the SRI phenomenon. The National Food Security Mission (NFSM) is the only national policy document that has mentioned SRI as a strategy for improving rice productivity. Yet, investments on SRI through NFSM have focused on the distribution of inputs rather than on building innovation capacities. A considerable shortfall in production targets due to the recent drought last year has brought in some rethinking with a greater openness of Ministry officials for a dialogue with civil society organisations to explore investments and scale up through NFSM funds. This dialogue in the past few months involving no less than five national-level consultations has been possible due to the success of evaluations of SRI projects by civil society organisations.

In contrast, donors such as SDTT and agencies like WWF (World Wide Fund for Nature) have been willing to commit substantial resources to SRI dissemination. The surprising spread has been enabled due to the way that knowledge is conceptualised in agriculture on the field by farming communities in collaboration with CSOs, government agencies and research agencies, often in that order. The drivers of change have been varied in different states and have been characterised by actors combining in complex ways by being ‘strategically opportunistic’ and ‘open to surprise’. Recognising these features is essential both to appreciate the complexity of the innovation architecture and to plan for change.

A look at the spread of SRI in India suggests four phases of the SRI journey in the last decade. The phases are not very distinct or watertight, but, for convenience and analytical purposes, the characteristic features of the innovation system have been used to describe the phases. Rooting this unconventional innovation in Phase 1 from 1999–2003 has had the contribution of both research and non-research actors. Some civil-society actors chose to experiment with it almost as soon as they heard of it in 1999, although with limited success. By 2003–04, SRI was proven satisfactory, especially by research agencies, as a cultivation

option for farmers. The first national symposium on SRI held in 2006 as part of a larger discussion on water management soon led to more actors such as WWF taking a more active role in SRI, with initial collaboration with the state agricultural university of Andhra Pradesh (AP).

In the third phase of SRI (2006-08), there was a slow but perceptible shift from the centres of SRI (TN and AP, and their state agricultural universities) to the peripheries of rice cultivation, in smaller, more marginal states and for poorer, more marginal populations. AP initially led the spread of SRI, but did so through conventional mechanisms, offering regular training programmes to agricultural officers across the country with support from the Indian Council of Agricultural Research (ICAR). The conventional extension model of on-station demonstration farms was replicated, and it was expected that 'progressive farmers' would visit these and take up SRI themselves, demonstrating this in their fields and spreading it like improved varieties of seeds. Government figures indicate that over 30,000 demonstrations were held from 2003–04 to 2007–08 on SRI, and yet, despite several farmers knowing about SRI through the active role of mass media in the early years, and also the announcement of support from the Chief Minister following a visit to a field in 2005, the uptake of SRI by extension agencies was poor. Clearly, the conventional strategy of demonstrations leading to early and late adopters did not work.

In sharp contrast is the case of the small state of Tripura, badly connected with the rest of the world (it shares international boundaries on three sides with Bangladesh). There an agricultural scientist of the state research station heard of SRI from distant sources, but he followed a different strategy by first quietly building up acceptance from farmers in the state and then systematically with the state's policy actors, including the Department of Agriculture but also the decentralised local government (Panchayati Raj) agencies. The experiments in Tripura were quickly moved to the field, and soon the results were reports of actual farmers taking up SRI, as is evident in Table 2.

Table 3: Spread of SRI in Tripura 2002–03 to 2007–08

Year	Area covered through SRI (ha)	Total paddy area (ha)	Covered through SRI (%)	Farmers involved (No.)
2002–03	8.8	239,670	0.003	44
2003–04	17.6	242,110	0.007	88
2004–05	176	238,950	0.07	440
2005–06	352	237,150	0.14	880
2006–07	14,678	235,272	6.23	73,390
2007–08	32,497	235,938	13.77	162,485

Source: Presentation made by Dr Mazumder at the 'SRI Scaling Up: Future Directions' meeting at ICRISAT, 3 February 2009.

The policy actors in Tripura realised the potential of SRI's contribution to local food security and committed support, including financial, to take SRI forward. By 2008, 160,000 small and marginal farmers were using SRI methods in Tripura on 32,500 ha. Tripura also brought a new dimension to the innovation, suggesting the need to move away from a strategy of maximising yields to one that has a poverty focus and a pro-poor agenda. What was more important was not the absolute yields achieved but the improvement that the farmers could manage given their local resources.

CSOs have taken an active role in spreading SRI (Shambu Prasad 2008). They have been able to reverse the trend of innovation stagnation seen in some states. WWF played an important facilitating role in bringing actors together and getting them to engage with SRI. The national symposia on SRI in Hyderabad, AP (2006), Agartala, Tripura (2007), and Coimbatore, TN (2008) placed SRI in the public eye as a credible alternative. As a result,

there has been a change in many research organisations, such as the Directorate of Rice Research (DRR, of the Indian Council for Agricultural Research), that have taken up SRI research. Also other organisations, such as WASSAN (Watershed Support Services and Activities Network), chose to take SRI forward differently by engaging with farmers and literally taking SRI research to the field and organising knowledge dialogue, where government engineers designing weeders were challenged with local conditions and adaptations. WASSAN also enlisted key trainers who could take SRI to other states. This horizontal transfer of knowledge worked very well in smaller states like Uttaranchal and Himachal Pradesh. The Peoples Science Institute (PSI) has been at the forefront of experimenting with SRI principles on other crops, having pioneered SRI in these northern states. SRI use went from 40 farmers in 2006 to almost 600 in 2007, and then to over 13,000 in 2009, with SDTT and WWF support.

The entry of several new actors in the SRI innovation system in India from early 2007 has made the system very complex and diversified. After a lull in SRI coverage from 2004–07, there has been a spurt across the country. A key private donor, SDTT, with a good reputation for working effectively with NGOs on food security and livelihood interventions focused on small and marginal farmers in food-insecure areas of eastern and northern India, chose SRI as a strategy for intervention with a spread across 12 states and with over 100 partners. The Trust is now working with 150 partners in India covering 105 districts. Its partners have encouraged over 56,000 farmers, mostly very small and poor, to practise SRI, covering an area of 7,400 ha during *Kharif* (the main monsoon crop) 2009. A focus on rainfed farming and resource-poor farmers has become the new driver of change in SRI.

4. SOCIAL CAPITAL, DROUGHT AND SRI

An important feature of SRI spread has been the alternate extension paradigm that has enabled this transformation. The names of these extension agent roles has been varied (SAP or Sustainable Agriculture Promoter in South India; CRPs or Cluster Resource Persons of PRADAN; 'master trainers' for PSI); but in all cases, the emphasis has been on building local capacities, organising exposure visits, and farmer-to-farmer extension and an active learning-by-doing approach. Knowledge transfer has also benefitted from online methods discussed later. SRI has enabled farmers to adapt to changing conditions, and this was seen during the severe drought in India. Details of studies on whether SRI has potential to cope with drought are still being collated as part of a nation-wide survey by a few organizations, yet there is some systematic information from PSI on this.

The effect of a system's effectiveness can be gauged by its ability to respond to crises. A good example is the way that farmers have been encouraged to adapt and modify their practices during a severe drought. The overall rainfall deficit during 2009 in Uttarakhand and Himachal Pradesh was about 40-46 %, affecting over half of the mountain farmers. PSI had mobilized over 13,000 farmers to use SRI methods in 2009 and following monsoon failure, many farmers made alterations in the recommended SRI practices, transplanting 1 to 3 seedlings per hill (instead of just one), being 10-25 days old (instead of less than 15 days), and keeping plant-to-plant and row-to-row spacing of 15-25cm x 15-20cm, respectively (somewhat closer than usually recommended). Alternate wetting and drying of field could not be followed due to the unavailability of irrigation water, thereby also limiting the use of mechanical weeders. To further cope with the delayed monsoon, PSI facilitated 1,200 farmers to adopt SRI principles in other crops, namely, *mandwa* (finger millet), *rajma* (kidney beans), and *makka* (maize) covering 32.39 ha.

A comparison of crop yields with the previous three years' data indicates that during the drought, the grain yields of the conventional crop decreased by 31 percent as compared to reduction of only 13 percent in the SRI crop. The advantage of SRI methods over

conventional management in a drought year, though, was as high as 92%, indicating adaptive capacities of farmers and the ability of SRI to cope with climatic stress.

Table 4: SRI and conventional paddy during normal and drought year in Uttarakhand

Particulars	Normal Years (2006-2008)		Drought Year (2009)	
	Conventional	SRI	Conventional	SRI
Average no. of effective tillers/plant	7	21	5	18
Average plant height (cm)	99	122	88	102
Average panicle length (cm)	18	24	19	25
Average no. of grains/panicle	93	177	90	174
Grain yield (quintals/ha)*	36	55	25	48
% increase in grain yield		**53**		**92**
Straw yield (quintals/ha)*	111	145	51	85
% increase in straw yield		**31**		**67**

Source: Debashish Sen (2010). *Tons/ha = one-tenth of quintals/ha

We conclude this paper by drawing insights on innovation and sustainable development from the spread of SRI in India, focusing on the emergence of a new commons in agriculture.

5. SRI AND THE NEW COMMONS IN A

There are several insights and lessons for agricultural innovation and sustainable development that emerge from the surprising spread of SRI in India. The most important has been the sense of hope being infused into the distressed farming community who now feel they have greater say in production processes, countering an earlier state of dependence on external inputs. Farmers are able to use water better, improve their soil fertility, and now know how to 'play with the monsoon,' saving their crops when rains are delayed. Transplanting can now be better timed and even repeated to cope with climatic stress. As SRI's productivity gains are derived from new knowledge and its application, rather than expensive material inputs, it necessitates changes in extension processes from material provisioning to inter-personal interactions, observing, experimenting, evaluating, encouraging, etc. Farmers function more cooperatively and collectively, with self-organisation building the foundations for on-going innovation.

At the field level, SRI requires managing local innovations to ensure timeliness of operations. Its spread and scaling-up have also demanded new alliances between local, regional, national and even international actors, on the one hand, and newer alliances between research and non-research actors. Experiences in Orissa with a new kind of multi-institutional, multi-level, cross-sector 'learning alliance' have shown that working within complex and changing environments requires public 'spaces' where continuous knowledge dialogues are facilitated, leading to action plans and enabling public policies that are grounded in field realities. In this process, learning from similar actors in other states, regions and nations can play a big role. It is not uncommon to see state-level workshops where government officials, researchers, civil society organisations and farmers from several states participate together.

This fluid architecture of learning has not been witnessed often in agriculture; especially when as in the case of SRI there is no single driver, typically the private sector, which is pushing the system forward. Just like the increase in productivity that SRI manages through

lesser inputs, the spread of SRI without an active profit-driver is counter to the current conventional wisdom in agriculture and rural development that seeks to promote vigorously public-private partnerships or PPPs, a euphemism often for privatising public extension services. SRI brings to the fore the fourth (or missing) P in these partnerships, namely **people** or their communities.

At the heart of the spread of SRI, both internationally and in India, is the philosophy that knowledge should be common property, not something locked up or possessed in a few institutions or a few hands and heads, whether public or private. From its inception, knowledge on SRI has been freely available as the promoters of SRI have shared ideas with farmers and researchers alike, in keeping with the motivation of its originator, Fr. Henri de Laulanié, for whom SRI was a labour of love.

In India, many civil society organisations have accessed information on SRI through their respective networks much earlier than research organisations. The internet has indeed played an important role in enabling this flat architecture of a knowledge commons. Contemporary models of extension advocate the use of ICT, setting up often expensive expert systems wherein a doctor or agricultural scientist in a laboratory transmits knowledge to a patient or farmer. The spread of SRI knowledge, on the other hand, has been facilitated by knowledge transfer on a more open platform that has not privileged any particular expert. It treats knowledge not as a finished product to be dispensed, but as a work in progress, involving two-way flows.

A manifestation of this approach to 'knowledge as commons' is seen in the way that knowledge is organised in the SRI website: http://ciifad.cornell.edu/sri/ . SRI actors have made extensive use of this freely-available resource. It is common to find SRI extension manuals in India and elsewhere having pictures of Sri Lankan women doing transplantation, a Cuban, Afghan or Malian farmer comparing his SRI and non-SRI plants, or demonstrating differences that SRI practices can make. These pictures have been copied and used many times, around the world, without any creative commons license! The SRI website has only posted information that is agreed to be in the public domain.

It is not surprising to find a lot of material from India in the SRI website. An Indian website on SRI (http://www.wassan.org/sri/) is hosted by a Hyderabad-based organisation WASSAN, which initially used this as an extension of its own resource centre but it has been accessed extensively by people in India and elsewhere. Its section presenting and evaluating different weeder designs has become a worldwide resource for SRI practitioners. The important aspect of this knowledge flow is the non-exclusivity, or rather the complementarity. No organisation believes in being *the* single source or clearing house of knowledge, but rather one of several diverse ways for spreading knowledge. SRI resource materials reflect this diversity, with each organisation developing its own CDs, training programmes, etc. giving a local flavour to knowledge. Manuals, reports, etc. are posted on the worldwide web for others to learn from and borrow from, making the SRI movement both international and quite localised.

A recent application and use of the internet is the use of electronic groups. The SRI India group (http://groups.google.com/group/sriindia) is one of the most popular sources of information on SRI today. It was established following the national symposium on SRI at Agartala in October 2007 and was initially set up as a way of giving the hundred partners of an Indian donor agency, the Sir Dorabji Tata Trust (SDTT), a quick, low-cost, easily accessible means of discussing SRI and sharing experience. Today the group has over 360 members, has had over 2,600 discussions, and has a majority of members and contributors in states outside those where the Trust operates. A true knowledge commons, the moderators receive requests from all over the world.

The group is diverse and accommodates different viewpoints and is open about conflicting viewpoints. There are members who support hybrid rice and mechanisation, and others who vigorously champion traditional varieties, organic methods, and hand tools. Yet, the group has shown tremendous participation in sharing and creating common resources. This was called upon recently when the National Food Security Mission (NFSM) was engaging with civil society organisations, and there was an urgent need to quickly put together information on the number of farmers using SRI methods and their acreage. A database was created in a very short span of time online across the country. Such a task would have otherwise taken weeks, if not months. It would be folly to see the use of internet in isolation, however. The SRI network uses it as a tool for networking, learning and sharing, and it is not a substitute for real extension work in the field. In fact, some of the more active SRI promoters have little time and access to the net and cannot contribute to the e-group, but yet they do keep following the conversations.

The idea of a knowledge commons and its application has not found much application in agricultural innovation even as this concept has often been discussed in forestry, fisheries, etc. Historically, agricultural technology has been generated with public-sector support and has been freely available to anyone who would utilize it, purchasing whatever 'hardware' is needed but with 'software' in the public domain. Why is it that ideas and experience concerning open innovation, which is currently discussed in the management literature on innovation and which is celebrated by many corporate houses today, finds so little mention within agriculture circles where possibly it's potential is even greater? Why is it that discussions on new commons omit possibilities from the agricultural sector and are restricted largely to the urban commons or internet?

We have here tried to show that there is a case for closer examination of the ideas of 'new commons' in agriculture that are emerging in unexpected and diverse ways. Much more research on this might be required that generates a better understanding of how networks function (tools such as social network analysis can be used) and how they could be promoted. We suggest that greater attention be given to knowledge (not just information) flows, and to the processes of co-creation of knowledge. The complex challenges of agriculture in the twenty-first century require newer lenses for viewing reality, especially its changeful dimensions. We have tried showing through the case study on SRI that newer innovation architectures are available for making progress not limited to laboratories, but changes that reach and are in fact improved as well as applied at the grassroots. Researchers are welcome to participate more pro-actively in this emerging new commons movement by exploring how this could be extended to other domains beyond SRI. Today, as small and marginal Indian farmers have shown, SRI is not just about rice, but its ideas and principles are being extended and extrapolated to other crops, wheat, sugarcane, finger millet, maize, kidney beans, mustard, even brinjals.

Nobody knows where these diverse streams of innovation will take the agricultural sector, or if and where they will end. In an era when high-technology innovation in agriculture is so celebrated, and heavily invested in, still with limited promise for those agricultural producers who most need to raise the productivity their restricted resources, it is timely to consider the possibilities that this 'new commons' is opening up for agriculture.

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