

Beyond Technology Dissemination - Can Indian agricultural extension re-invent itself ?

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Introduction

Agricultural extension in India is at the crossroads. A decade after the end of the Training and Visit (T&V) System, the Department of Agriculture (DoA), the main extension agency, is struggling to find a fresh direction and approach. At the same time the nature of Indian agriculture becomes ever more complex. New opportunities (and threats) for trade in international markets join older concerns of supporting the rural economy where agricultural production and employment support the livelihoods of many of the poorest in society. The public sector, including both agricultural research and extension organisations, has also seen the emergence of new imperatives such as cost recovery, decentralisation, pluralistic funding and privatisation.

The shortcomings of public sector extension arrangements in India are well documented and some reform measures have been implemented. But unfortunately, planning and evaluation of such programmes is based on a very narrow view of the proper role of extension, equating it to an agency for technology dissemination. This is certainly a role which extension can play. However, it is widely acknowledged that there are other important facilitating functions that it could perform to help create a stronger agricultural innovation system adapted to evolving rural economies and the agendas of stakeholders, especially the poor.

To remain relevant, Indian agricultural extension has to reinvent itself. This will require considerable institutional and organisational changes in both the public research and extension arena. This policy brief explains the restrictions that a technology dissemination focus places on the debate of extension reform and provides a more holistic viewpoint to help reconsider critical policy questions facing India's public research and extension organisations.

The diffusion of innovations - a myth

For the last 30 years the practice of extension has been guided by the all-pervasive, "diffusion of innovations" tradition¹. This model evolved in a particular institutional context, based on well-known case studies, notably the adoption and diffusion of hybrid corn in the USA in the 1950s². These case studies simplified a complex process into a step-wise, linear sequence of activities, that was described without reference to the way agendas of different stakeholders were addressed and how technology priorities were selected and promoted. This *simplified reality* has seduced scientists and extensionists alike.

The myth of the smooth progression of research to adoption and diffusion among farmers still continues to influence the theory and practice of extension. Even though this *transfer of technology* or *linear model of innovation* has been widely discredited³, efforts to dislodge it have been unsuccessful⁴. The result of this is that tasks of technology development (research) and technology transfer to farmers (extension) are performed by two completely separate organisations with tightly defined and mutually exclusive roles. These organisations also sit separately from other public agencies with allied roles in rural development sector.

From diffusion to systems of agricultural innovation

Thinking on the nature of the agricultural technology development and promotion process has, however, advanced in the last 20 years. This includes the recognition that: technological innovation comes from multiple sources, including farmers⁵; and that the way the agendas of different stakeholders are represented affects the "appropriateness" of new technologies developed. Farmer participation in technology development and participatory extension approaches have emerged as a response to such new thinking. This has often failed, however, to challenge the wider institutional and political context in which "participation" takes place.

During the last decade, the extension literature has been notable for holistic ideas such as the Agricultural Knowledge and Information System (AKIS)⁶. This recognises a wider set of information sources and the value of creating systems that assist in the generation and dissemination of knowledge, especially in the context of sustainable agriculture and progress towards an ecological knowledge system⁶.

More recently the notion of extension as part of a wider system has emerged. For example the "interdependence model"⁷ and the innovation system framework⁸ offer more inclusive way of thinking about the actors and the institutional context in which the generation, diffusion and use of new knowledge takes place. This system of actors and process not only includes research and extension, but also technology users, private companies and non-governmental organisations and supportive structures such as markets and credit.

The innovation system framework, in particular, places emphasis on the importance of learning processes as a way

of evolving new arrangements specific to local contexts. The political economy in which these processes and activities take place is viewed as a key contextual element, where investigating and managing stakeholder agendas can help address the asymmetry of conventional research-extension-farmer relations. The advocates of the approach suggest that its use for the evaluation and planning of technology development and promotion activities is the only way to build locally adapted, collective operational capacities where institutional concerns such as a poverty focus can be monitored and sustained^{9,10}. Although these various "systems" concepts of technology development and promotion provide significant policy insights, none of them has yet found mainstream operational uptake in agricultural extension system.

The legacy of an obsession with technology dissemination

In India, although extension practices have changed over time, its role and its relationship with research remains stuck in the institutional design of technology dissemination. It continues to be fully dependent on public sector research to get "messages" for disseminating to farmers. The much discussed T&V system of extension, introduced in India in the mid-1970's was classically of this type, epitomising the linear, transfer of technology model. It assumed that lack of management orientation of extension officers and their poor links with research were the main reasons for inadequate transfer and adoption of technology.

T&V certainly improved funding and manpower intensity and introduced a number of organisational changes, including a unified command for the service. It also contributed significantly to productivity increase in irrigated regions. Its poor performance in the majority of rainfed areas was explained by the extension profession as reflecting the lack of viable, need based and appropriate technologies to disseminate. The research profession viewed it as another indication of a weak extension system that was failing to disseminate technologies it had produced.

Post T&V period saw states introducing: decentralization (extension planning and control under elected bodies at the district/block level); contracting NGOs for some extension activities; adoption of a group approach (instead of the earlier individual approach); use of para-extension workers (as substitute for field extension workers of the DoA); setting up multi-disciplinary teams of scientists of State Agricultural University at the district level; setting up agro-clinics; and formation of a registered society, Agricultural Technology Management Agency(ATMA) at the district level, by integrating the functions of key stakeholders involved in agricultural development in the selected districts. Another trend has been the formation of new, quasi-government organisations to implement specific agricultural development programmes. This has been a reflection of the increasing inability of the line department's(especially the DoA) to deliver results due to its bureaucratic, hierarchical approach, lack of accountability to clients, weak partnerships with allied organisations and limited expertise.

This continued obsession with dissemination can also be seen in the more recent initiatives. For example under the National Agricultural Technology Project (NATP), the initiatives exploring new extension approaches fall under the

theme *Innovations in Technology Dissemination*. This narrow focus has restricted the emergence of a more broad-based role and the potential contribution this could have made to strengthening rural livelihoods, the agendas of which include but often go beyond agriculture. For example, over the last decade, there has been an increasing realisation of the importance of tasks such as community mobilisation, conflict management, problem solving, education and human development and the need for extension staff to acquire social science skills to perform these tasks^{11,12,13}.

Similarly many extension practitioners realise that extension should engage with a wider range of issues related to agriculture. This includes markets, credit, and insurance, in addition to technology and research services and supply of inputs. An organisational development role is also envisaged as a way of strengthening the negotiating position of farmers in these arena. The best extension practitioners have always known the importance of collective learning in devising successful, locally relevant extension agendas and approaches.

While these types of observations suggest that the *systems* concepts would be useful as a way of rethinking extension on a broader canvas, the reform process in India has not been so expansive.

The rhetoric of reform and the reality of implementation

Suggested ways of improving the performance of extension, include many familiar features. These can be seen in the recent Policy Framework for Agricultural Extension (PFAE) of the Ministry of Agriculture, Government of India¹⁴ (Box 1). Though the broad contours of policy changes suggested are well considered and relevant, the PFAE underplays crucial implementation problems of introducing reforms. In particular the wider institutional framework of public extension imposes a number of restrictions on the introduction of change and the development of new approaches.

Firstly as extension performance is still judged in technology adoption terms, the prescriptions for its reform continue to predominantly focus on improving the efficiency of dissemination.

Secondly, because extension is administered as a centralised hierarchy, (at the centre and state levels) reform guidelines are both centrally generated and universal. The consequence being that the institutional innovations necessary to produce new, locally generated organisational forms are likely to be stifled by blueprints and targets for uniform implementation of programmes. Centralised financing and accompanied monitoring and evaluation, also restricts the need to develop local accountability.

A related element of this is that both national and donor agencies have been eager to commit substantial funding for major programmes, but have been reluctant to make modest investments in the systematic institutional evaluation of earlier programmes to draw out generic principles that govern the relative success of particular programmes.

Thirdly, because the understood role of extension is highly restricted, even where reform prescribes training, there is no recognition of the need to develop the skills to innovate

Box 1. Policy framework for Agricultural Extension

The PFAE acknowledges current limitations of public sector extension and set out a new vision and strategy for agricultural extension in India. Highlighted are the following measures:

- Adoption of farming system and farmer participatory approach;
- enabling problem solving skills of farmers through an interdisciplinary approach;
- public funds for private extension;
- privatisation of the private goods elements of extension in favourable areas;
- provision for cost recovery and co-financing of extension via farmers organisations;
- reduction in the number of village level workers;
- use of para extension workers and farmer interest groups for extension;
- employing more subject matter specialists;
- single-window services at block level using the Agricultural Technology Management Agency (ATMA) model;
- preparation of strategic research and extension plans;
- improving the research-extension-farmer interface;
- skill development of extension agents;
- improving women's access to technology;
- provision of market information;
- wide use of information technologies;
- linkage with agro-processors;
- and the government to act as a facilitator and creator of an enabling environment.

(technologically and institutionally) and generate new location specific approaches.

Fourthly, it is not just the public extension system that needs reform. A new (and much required) relationship with public agricultural research organisations can not emerge until they too undergo considerable institutional change. The same is true for a broader set of public agencies allied to rural development.

To meet the emerging challenges, extension needs to overcome the constraints imposed on it by the conventional understanding of its role and function. The reforms suggested in the PFAE will not by themselves reinvent Indian agricultural extension unless they are accompanied by a much more explicit agenda of institutional learning and change for the public agencies involved. How might this be approached?

Principles for re-inventing agricultural extension

The PFAE already contains one of the first key principle for reinventing agricultural extension, namely a much expanded role. Farmers need a wide range of services, with improved access to markets, research, advice, credit, infrastructure and business development services.

A second principle is a more explicit acknowledgement of the changing rural development agenda. Particularly the demand for extension to play a major role in reducing the vulnerability of the poor¹⁵.

A third premise bringing together these two principles is the need to re-map different elements of agricultural innovation systems in ways that addresses conventional service-client asymmetries. Clearly this is something that has to be devised locally, with arrangements evolving overtime. The fourth related principle therefore concerns the adoption of a learning

Box 2. Institutional learning in action -- a case of KHDP

Kerala Horticultural Development Programme (KHDP) was established as an autonomous organisation by the Government of Kerala in 1992 with European Community financial assistance. The aim of KHDP was to increase and stabilise the income of small-scale fruit and vegetable farmers. The programme has five notable elements:

- **Organisational structure-** A new organisation was established with consultants and 250 young professionals skilled in agriculture, business management and social work.
- **Experiments to access technology-** Recognising the need to develop appropriate technological solutions for farmers, KHDP initially funded research in the State Agricultural University. A five-year agreement was signed with the university to provide research backstopping. However, because of a number of institutional constraints in the university it was not possible to arrive at a satisfactory long-term contract research arrangement. This lesson was learnt over a protracted and uneasy series of negotiations to try and arrive at adequately farm focused research and adaptive technology development protocols. Through experimentation (and necessity) KHDP found that much of the envisaged formal research role of the University could be replaced by employing graduate level agricultural officers who were willing and able to undertake participatory technology development (PTD) with farmers. It was found, however, that some formal research assistance is still required. This is contracted out for very specific and well defined short term tasks.
- **Farmer Organisational development-** In its early years KHDP quickly found that it needed to organise farmers into groups, both to help promote new technology and PTD skills as well as to help farmers access credit and strengthen negotiating power through collective marketing. The subsequent development of self help groups (SHG) with master farmers arose out of a process of trial and error, to find out the size of groups, how these would be managed, the types of activity that they could engage in collectively and the procedures for resolving disputes.
- **Farmers as partners-** To ensure a dependable source of income to farmers through processing their produce, KHDP also established a modern pineapple processing factory with farmers as share holders. Today the produce from the factory is traded in the domestic and international markets.
- **Transformation as a new organisational entity-** Unlike the usual end of most external funded programmes, the KHDP re-invented its future by registering in 2001 under Indian companies act, in order to provide continued support to growers. 50 % of the shares of the company are held by the SHGs of farmers. The remaining 50 % shares are held by the state government and agencies such as banks and research institutions.

approach where interventions are inherently experimental and iterative.

Box 2 illustrates these principles, describing an agricultural development programme where technology backstopping was provided as part of a wider basket of agricultural production and marketing assistance. In this case it was realised early in the project that both new technology and market development were critical ways of supporting livelihoods. But initially technology backstopping was viewed as a conventional dissemination task and market development was viewed in a fairly mechanistic sense. However, because of a large degree of autonomy and

because institutional learning complemented planned targets as the key management tool, the project was able to innovate. This has been highly successful.

The message for planners is that extension needs a much larger degree of flexibility, a learning environment and a wider range of expertise to fulfil an expanded role. Only then will new initiatives be successful and sustained. A first step should be to undertake a detailed institutional analysis of the pilot ATMA scheme and other experimental approaches implemented in the last decade. Special attention needs to be given to understanding the difficulties of implementing new ideas in an old and rigid organisational and institutional hierarchy. An evaluation of this type would highlight the scope of institutional change and learning that is required to reinvent agricultural extension in India. It could also inform a further series of diverse and experimental extension

schemes. Such schemes could have the potential for generating the necessary institutional innovations that will allow extension to fulfil its promise of supporting rural livelihoods in the 21st century.

Conclusions

The last decade witnessed an accelerated decline in the credibility of public sector extension. Unless extension grows beyond technology transfer, and clearly articulate its role in facilitating broader changes supportive of evolving rural livelihoods, its ability to remain relevant in the future is extremely doubtful. While the reform process is heading in this direction, planners need to face up to the need for considerable institutional change and learning if extension is to escape from the shackles of a technology dissemination role.

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