POVERTY & AGRICULTURAL EXTENSION

Overseas Development Institute

Extension, Poverty and Vulnerability in India:
Country Study for the Neuchâtel Initiative

Rasheed Sulaiman V
National Centre for Agricultural Economics and Policy Research, New Delhi

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Working Paper 154
Results of ODI research presented in preliminary form for discussion and critical comment

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Copies of the 'Common Framework of the Neuchâtel Group' and of the 'Guide for Monitoring, Evaluation and Joint Analyses of Pluralistic Extension Support' (English or French versions) can be obtained by writing to:

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Acronyms

ADP	Agricultural Development Project
AFPRO	Action for Food Production
ATIC	Agricultural Technology and Information Centre
ATMA	Agricultural Technology Management Agency
BAIF	Bharatiya Agro-Industries Federation
CD	Community Development
DAATC	District Agricultural Advisory Technology Centre
DAC	Department of Agriculture and Cooperation
Danida	Danish International Development Agency
DFID	Department for International Development (UK)
DoA	Department of Agriculture
EC	European Commission
EGS	Employment Guarantee Scheme
FIAC	Farm Information and Advisory Centre
FIGs	Farmers Interest Group
FPR&E	Farmer Participatory Research and Extension
GDP	Gross Domestic Product
GO	Government Organisations
GoI	Government of India
HRD	Human Resources Development
IADP	Intensive Agricultural District Programme
ICAR	Indian Council of Agricultural Research
ICDS	Integrated Child Development Services
IMF	International Monetary Fund
IFFCO	Indian Farmers' Fertiliser Co-operative Limited
IRDP	Integrated Rural Development Programme
IT	Information Technology
ITD	Innovations in Technology Dissemination
IVLP	Institute Village Linkage Programme
KHDP	Kerala Horticulture Development Programme
KRIBHCO	Krishak Bharati Cooperative
KVK	Krishi Vigyan Kendra (Farm Service Centre)
MANAGE	National Institute of Agricultural Extension Management
MGGA	Maharashtra Grape Growers' Association
MoA	Ministry of Agriculture
MRCMPU	Malabar Regional Cooperative Milk Producers' Union
NATP	National Agricultural Technology Project
NCAP	National Centre for Agricultural Economics and Policy Research
NES	National Extension Service
NGO	Non-Governmental Organisation
NSI	National Systems of Innovation
O&M	Organisation and Management
PDS	Public Distribution System
PRADAN	Professional Assistance for Development Action
PTD	Participatory Technology Development
R&D	Research and Development
SAU	State Agricultural University
SFAC	Small Farmers Agri-business Consortium
SHG	Self-Help Group

SMS	Subject-Matter Specialist
SREP	Strategic Research and Extension Plan
T&V	Training and Visit System (of Extension)
TAR	Technology Assessment and Refinement
ToT	Transfer of Technology
TPDS	Targeted Public Distribution System
UPDASP	Uttar Pradesh Diversified Agricultural Support Project
UPSLRP	Uttar Pradesh Sodic Land Reclamation Project
VBKVK	Vidya Bhavan Krishi Vigyan Kendra
VEW	Village Extension Worker
VST	Vazir Sultan Tobacco Company Limited
VPDO	Village Panchayat Development Officer
WTO	World Trade Organization
WYTEP	Women/Youth Training Extension Project

Summary

This paper examines the challenges in designing and implementing appropriate institutional arrangements for providing extension services in view of the changing context, the changing information and technological needs of farmers, and to emergence of new organisations in extension delivery. This particular focus is on what agricultural extension can offer the rural poor. India has sizeable areas with low agricultural productivity, high incidence of poverty, and with weak integration into markets. Questions are increasingly being asked about the role that public-sector extension can play in enhancing the livelihoods of the poor and reducing their vulnerability in these areas. Public-sector extension in Indian States started to adopt different approaches after the training and visit system (T&V) was established. The last decade has also seen an increased involvement of private extension providers, but their presence and activities are skewed towards well-endowed regions. This paper argues that to perform new roles with wider scope, extension services must change fundamentally, not only in personnel and resources, but also in their basic perceptions and practices as they relate to the role of the State in agricultural and rural development. A newly released consultation document at Government of India (GoI) level indicates awareness of the broad types of change needed. However, change in the practice of extension will be slow in India for complex reasons rooted in long-held perceptions about the rural poor, the private sector and the role of the state. Despite the foresight of the new consultation document, and examples of institutional innovations from within India, the great majority of extension remains publicly funded and publicly delivered. It is geared predominantly to the delivery of messages and (although recently less so) subsidies. Isolated innovations offer insights into potential ways forward for extension in the new millennium, but to reform a system in which there are many entrenched actors across the different States within the federal system is clearly going to be a major challenge. This paper stresses the fact that reforms favouring the poor are unlikely to be achieved unless agricultural policy towards the weakly integrated areas becomes rather less concerned with productivity enhancement alone, and more with the ways in which increased productivity can be linked to reductions in vulnerability and employment creation. A greater effort in trying different approaches to active partnership between organisations holding complementary skills, to evaluating these at local level and to more systematic approaches to organisational learning will be vital to ensure progress.

1. Introduction

Since the 1970s, agricultural productivity growth in developing countries has been boosted by the arrival of high-yielding varieties, which in combination with fertiliser and irrigation achieved impressive gains in certain areas. In addition, the agricultural growth created by the Green Revolution in some places created associated opportunities for non-farm livelihoods that could absorb surplus agricultural labour. With the advent of market liberalisation, structural reforms are beginning to redirect public funds away from direct support to farmers towards creating a supportive environment for agriculture as part of a holistic rural development strategy. This process of 'rolling back' the State is an enormous challenge for both governments and producers. Governments are challenged to make choices about which services to continue funding and by deciding how to manage the structural and organisational changes that accompany reform. Producers are challenged to understand their role in the global economy, to find ways to make agricultural enterprise productive without continued government support, and, when necessary to take advantage of exit routes from farming.

Methodological shortcomings notwithstanding, there is enough evidence to show that returns to investment in extension education are reasonable and perhaps comparable to those in other public services (Gill, 1991). But new political agendas, increased cost-consciousness and budgetary restraints, and major technical advances are contributing such significant changes as the reduction of public-sector services, experimentation with new service delivery structures, growing interest in privatisation and decentralisation of activities, and shared responsibilities between government and private user associations (Rivera and Gustafson, 1991).

Any reconsideration of the role of extension faces at least two broad sets of challenges: first, changes must be consistent with wider thinking on the role of the state. Economic reforms pursued in many developing countries, including India, have accelerated the 'rolling back' of government out of the provision of such services as agricultural extension. Rapid economic growth needs an efficient flow of information to farmers. The public-sector extension system has shown it is capable of facilitating this process but with levels of success that vary markedly between areas that are well-integrated into markets and those which are not. A number of issues plague public-sector extension. Extension here refers to the collectivity of organisations in the public, private, co-operative and voluntary non-governmental organisations (NGOs) sectors that are providing (or supporting farmers in accessing) knowledge, information, and skills – not just in agricultural production, but also in related provision of the related inputs, processing and marketing. Traditionally, public-sector extension has been entrusted with the role of providing most of these services. However in the last two decades, organisations in the private (profit and non-profit) sector are increasingly coming forward to provide extension support to farmers. But bearing in mind the size of the country and the challenges that face extension, these attempts are few and dispersed. Furthermore, the activities of these different organisations are poorly integrated with each other at field level. There is an increasing realisation that it is neither desirable nor possible for the public sector to provide or fund all of these services. An important challenge is to develop effective partnerships between different organisations.

A further set of challenges lies in the recently improved understanding of poverty: it is now widely recognised as multidimensional, and that the poor have assets as well as needs and constraints. They draw on these in a context of vulnerability, and the types of livelihood outcome they can achieve from combining assets in different ways will depend not only on this vulnerability, but also on the ways in which policies, institutions (whether formal or informal, local or higher level) and processes affect their livelihoods. The sustainable livelihoods framework used by the UK Department for International Development (DFID) summarises these interactions (Farrington,

2001). The transfer of production technologies continues to dominate the extension agenda. Whilst the emphasis on productivity enhancement is important, as has been argued elsewhere (Farrington et al., forthcoming), that if extension is to benefit the poor, especially in the poorly integrated areas, higher priority than hitherto must also be given to technologies that reduce vulnerability and enhance employment. Though policies and programmes at present have not articulated these wider roles for extension, they will need to do so increasingly in the years to come if they are to adequately address rural poverty.

2. Background: Country Setting and Agricultural Sector

India is a vast country with marked regional diversities in agro-climatic environment, resource endowment, and population density. It is characterised by spatially uneven economic and agricultural development with eastern, northeastern, and many of the semi-arid central areas faring poorly. Agriculture (including cropping, animal husbandry, forestry and agro-forestry, fisheries and agro-industries) currently accounts for 26% of the national gross domestic product (GDP) and provides employment to about 70% of the work force. The distribution of land holding is highly skewed; 78% of farm holdings are small (less than 2 hectares) and in 1991 they commanded only 33% of the total net cropped area. The average size of holding was 2.28 ha in 1970/71, but fell to 1.55 ha in 1990/91 due to a steady increase in the number of agricultural families but virtually no expansion of agricultural land.

The series of interventions[1] initiated in the in the mid-1960s, that led to the Green Revolution in cereals production transformed the country from one of food deficiency to self-sufficiency. The Green Revolution, however, was restricted to productivity improvements in cereals, especially wheat and rice and in the initial decades primarily grown in irrigated regions. In the subsequent decades, productivity increased in such other crops as oilseeds, sugarcane, cotton, fruits and vegetables. The Green Revolution has generally bypassed India's vast rainfed tracts[2], especially arid zones, hill and mountain ecosystems and coastal regions, thus exacerbating agro-ecoregional and social disparities (ICAR, 1998). Despite its past achievements, Indian agriculture continues to face serious challenges because of the ever-increasing population, limited land and water availability and degradation of natural resources. There are wide gaps in yield potential, and the national average yields of most commodities are low.

India owns one of the largest livestock populations in the world. Most of these animals are reared in sub-optimal conditions because of the low socio-economic status of their owners. The fisheries sector plays an important role in the socio-economic development of the country. It is an important source of livelihood for a large section of economically backward population of the country, particularly in coastal areas. Since the 1980s, the growth in the production of milk, meat, poultry and fisheries has been very rapid.

Impressive increases in agricultural production during the last four decades have improved per capita availability of food. While extensive famines have been prevented, widespread endemic hunger still prevails among the economically underprivileged. India has made great strides in reducing its high level of poverty since the early 1970s when 55% of the population was living below the poverty line, to the 36%, who were still below the line in 1993/94. However, the reduction in poverty levels is not fast enough to reach the Ninth Plan target of 16.5% in 2001/02.[3] Poverty in India remains predominantly rural; three out of every four poor persons live in rural areas.

Agricultural growth was a major factor in reducing poverty in India in the 1980s. Even though the rate of agricultural growth in the 1990s was similar to that in the 1980s, agricultural growth in the

[1] The interventions were built on three foundations, namely improved package of farming technologies, a system of supply of critical modern inputs and a remunerative price and market environment for farmers.
[2] Rainfed agriculture covers 63% of the total cultivated land, accounts for 45 % of agricultural production
[3] According to Saxena (2001), this may be due to sluggish agricultural growth which is also poorly distributed spatially; inadequate reach of the Targeted Public Distribution System (TPDS) to the poorest in the northern and eastern states; the limitations of watershed development and poverty alleviation schemes; fiscal crisis caused by awards under the Fifth Pay Commission that led to reduced ability of states to spend on the social sectors and on maintenance of assets; and deteriorating governance leading to leakages and inefficient utilization of resources.

1990s had had been less effect on poverty reduction.[4] The Public Distribution System (PDS), Employment Guarantee Scheme (EGS) and Integrated Rural Development Programmes (IRDP) are the three programmes considered central to India's strategy on poverty reduction. India is also implementing a number of nutrition programmes, such as the Integrated Child Development Service (ICDS), school feeding programme, etc, However, there is considerable variation in the performance of these programmes across States, mainly resulting from the varied capacity of the States to formulate and implement viable schemes (for more details, see Saxena, 2001).

[4] According to World Bank (2000) country study on India, the growth of real daily wages in rural areas-a key link between agricultural growth and poverty reduction according to the analyses of the 1980s –slowed in the 1990s.

3. The Indian Extension System

3.1 Evolution

As in many other developing countries, extension services in India have traditionally been funded and delivered by government. Organised attempts in this direction started after the country became independent in 1947. Pre-Independence efforts had been largely local attempts, driven mainly by the humanitarian essays of a few individuals and organisations. These were area-specific and had limited impact. Independent India acknowledged the relevance of extension quite early, a decade earlier than organised attempts to strengthen agricultural research were initiated in the country. External aid for agricultural development emphasized extension in the 1950s. Two important programmes, the Community Development (CD) and the National Extension Service (NES) were clear examples of the GoI's commitment to provide a number of services in such areas as agriculture, health, animal husbandry, etc. to all sections of society. With little progress on the agricultural front, the need to pay special attention to agriculture was realised, and since the 1960s many new programmes that aim to raise agricultural production have been initiated.

Till the 1960s, agricultural extension was purely a function performed under the guidance of the State Departments of Agriculture (DoA). A few voluntary organisations were also doing effective work in their limited areas of jurisdiction. The Indian Council of Agricultural Research (ICAR) first became involved in extension activities in 1966, with the National Demonstration Programme. ICAR's involvement increased considerably in later years, with the initiation and spread of Krishi Vigyan Kendras (Farm Science Centres, KVK). ICAR also initiated such programmes as the Lab-to-Land Programme and the Operational Research Programme that were merged with the KVKs in the 1990s. The establishment of radio stations and the initiation of rural programmes resulted in the wider use of mass media for agricultural development. The print media followed suit. State Agricultural Universities (SAUs) initiated training programmes (for officials and farmers), demonstrations and exhibitions, and these were strengthened with the establishment of the Directorate of Extension in each SAU. Organisations created for the promotion of specific commodities (Commodity Boards) and specific areas (Command Area Development Authorities) also initiated extension activities. Extension was treated essentially as a public good, and with only the public sector involved with technology development and transfer, the focus was on spreading the reach of extension to all parts of the country through more extension staff and a large number of programmes.

The 1980s saw most of the States embracing the World Bank-funded Training and Visit (T&V) system. It improved the funding and manpower intensity of extension and introduced a unified command system of extension. The studies of the T&V system that largely ignored the agro-climatic and socio-economic diversity of the country produced mixed results. A review of evaluation studies of the T&V system revealed its impressive gains (in terms of productivity) in irrigated areas and its failure to make impact in the majority of the rainfed areas. The need for a proper analysis of institutional and socio-economic factors in rainfed areas, and the importance of social science skills in making relevant interventions was also highlighted (Farrington et al., 1998).

Since the 1980s, more and more NGOs, agro-input industries, and agro-processors have also become involved in agricultural extension activities. Now farmers' associations and producers' co-operatives are also involved in extension services for selected crops and commodities. A large number of extension services are being provided by input agencies, especially fertiliser companies. With increases in rural literacy, the newspapers are devoting more space to reports related to the use of agricultural technology.

3.2 Post-T&V innovations in Indian States

With external support drying up, many States found T&V unaffordable, and the 1990s saw them experimenting with the provisions of extension services. These experiments included decentralisation (extension planning and control under elected bodies at the district/block level), contracting NGOs for some extension activities, the adoption of group approaches (instead of the earlier individual approach), the use of para-extension workers (as substitutes for DoA field extension workers, and the setting up of multi-disciplinary SAU teams at the district level. Another trend has been the formation of specific organisations (which are less bureaucratic, more flexible, and have wider expertise) to implement special programmes related to agricultural development. This has been a reflection of the increasing inability of line departments to deliver results because of their strictly enforced hierarchies, inappropriate reward structures, lack of accountability, and limited expertise. A number of examples of innovation within the public sector are detailed in the following paragraphs. What is unfortunate is that very few of these have been monitored or evaluated in ways that would answer questions on their impact on whom, and under what preconditions.

3.3 Public-sector initiatives

Kerala

The Department of Agriculture was decentralised in 1987 through the creation of Krishi Bhavan (offices of DoA) in each *panchayat* (village council). In 1989, the group approach to extension for rice farming was adopted and subsequently extended to other crops. The European Commission (EC)-funded Kerala Horticultural Development Programme (KHDP) utilizes self-help groups, master trainers, collective marketing, and credit packages for the leasing of land (for more details see Isvarmurti, 2000). KHDP was initiated in 1993 and is implemented through an organisation created specifically for the Programme that includes consultants and 250 young graduates in agriculture, business administration, and other social sciences. The programme has recently been converted to a non-profit limited company called the Vegetable and Fruit Promotion Council, Kerala.

Rajasthan

Group approaches were adopted in the 1990s and currently village extension workers (VEWs) operate mainly through *kisan mandals*, i.e. groups of 20 farmers. Under the World Bank-funded Agricultural Development Project (ADP), Rajasthan encouraged NGOs to participate in extension and has contracted out some services to them. In a few blocks/districts this contracting amounts to the entire responsibility for extension. The State has also experimented with *kisan mitras* (para-extension workers).

Uttar Pradesh

Grass-root links to extension have been weakened by the redeployment of *kisan sahayaks* (agricultural assistants) as multi-purpose Village Panchayat Development Officers (VPDOs). Only 6,000 of the 50,000-plus *gram panchayats* have the *kisan sahayaks*, as VPDOs. In the rest of the *gram panchayats*, there is no *kisan sahayak* and the multi-purpose VPDO drawn from other

departments does extension work. However, the *kisan mitra* programme is currently operating on a large scale with the intention to cover every *panchayat*.

Two major programmes (both World Bank-funded) are presently under implementation: the Sodic Land Reclamation Project (UPSLRP) and the Uttar Pradesh Diversified Agricultural Support Project (UPDASP). UPSLRP is committed to farmer-led extension using *kisan mitras, mahila kisan mitras* (women para-extension workers), group leaders, master trainers, and commodity-based, farmer interest groups (FIGs) for implementation at field level. The UPSRLP is implemented through a government undertaking (Uttar Pradesh Bhoomi Sudhar Nigam) set up specifically for the purpose. The UPDASP encompasses human resource capacity building within line departments, decentralisation of technical and managerial decision-making through the Agricultural Technology Management Agency (ATMA, see 3.3.7), the deployment of self-help groups (SHGs) and FIGs, and an increased role for the private sector. The agricultural component of the UPDASP is implemented by DoA field functionaries.

Maharashtra

A single-window system was adopted in 1988, by merging the Departments of Agriculture, Horticulture, and Soil Conservation at operational level. This effectively improved field manpower intensity.

Punjab

The SAU–farmer direct contact method has been used for over the past two decades, and all front-line extensionists have now been upgraded to graduate level. Punjab Agricultural University employs its own multi-disciplinary extension team in each district, engaged in adaptive research, training and consultancy.

Andhra Pradesh

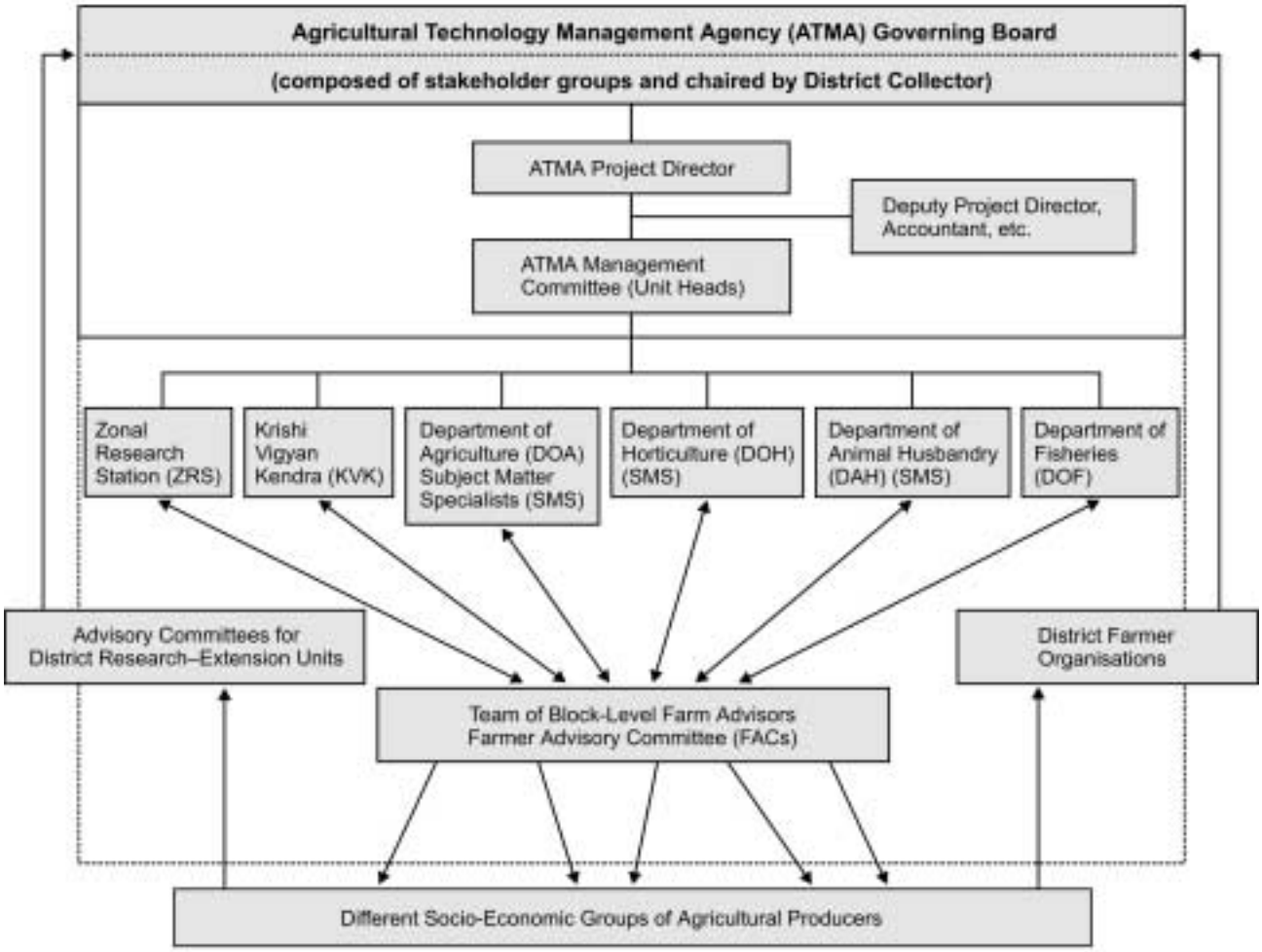
The SAU established a District Agricultural Advisory Technology Centre (DAATC) in all districts to refine technology, make diagnostic visits and organise field programmes in collaboration with the DoA and allied departments.

Agricultural Technology Management Agency (ATMA)

The most ambitious of the post-T&V public-sector approaches in India is the World Bank-funded Agricultural Technology Management Agency (ATMA) programme presently in progress in 28 districts in 7 States. Of these ventures, 6 are at an advanced stage (Fig. 1). ATMA is a registered society of key stakeholders responsible for dissemination of technology at district level. Under ATMA, day-to-day management decision-making is decentralised and farmer participation in both planning and implementation of interventions is institutionalised (for more details see ICAR, 1998), MANAGE (1999a, 1999b). As a society, ATMA can receive and use project funds in such a way as to incorporate such cost-recovery mechanisms as fees-for-service. The programmes are based on the Strategic Research and Extension Plan and prepared using a participatory approach. Farm Information and Advisory Centres (FIAC) are created at the block level act as the operational arm of ATMA. Farmer Advisory Committees are also constituted at the block level. These Committees

include all key stakeholders and farmer representatives. However, only a few of the farmer organisations constituted to date have initiated joint production and marketing activities. To identify whether ATMAs should be replicated elsewhere, both the process of its implementation, and its outputs need to be carefully monitored.

Figure 1 Organisational structure of the Agricultural Technology Management Agency (ATMA)



Source: MANAGE (1999b)

Special programmes for farm women

Women-targeted training initiatives have been set up in several States with external assistance. In Karnataka the DoA initiated the Danida-funded Women/Youth Training Extension Project (WYTEP) in 1983. WYTEP has established training centres, arranged extension programmes, and collectivized input procurement, shared learning, and micro-credit activities. Similar programmes operate in Madhya Pradesh and Tamil Nadu, also with Danish Assistance. Since 1992, the DoA of Rajasthan has been implementing a farm-women training programme as part of the World Bank-funded ADP. Three types of training programmes (one-day, one-week and two-week) are used to train farm women in different aspects of agriculture.

Other initiatives in the public-sector

The national Ministry of Agriculture (MoA) has initiated some important innovations during the last 20 years. Among these the establishment of an autonomous training institute, the National Institute of Agricultural Extension Management (MANAGE) at Hyderabad in 1987 was significant. Other important initiatives include the scheme, Agricultural Extension through Voluntary Organisations (initiated in 1994/95) and more recently, 'macro-management' initiatives in which 27 Centrally Sponsored Schemes were merged thus enabling States to increase the flexibility of their programme planning and prioritization at State level. Under a new scheme, the Central Government is providing a 25% subsidy to set up 5,000 agri-clinics using unemployed agricultural graduates to provide testing facilities, diagnostic and control services, and other consultancies on a fee-for-service basis. The programme is implemented through the Small Farmers Agri-Business Consortium (SFAC), and is principally financed through banks.

The national research organisation (ICAR) now has 261 KVKs (138 in SAUs, 26 within ICAR institutes, and 90 in NGOs and government bodies) organising vocational training for farmers (Das and Hansra, 1999). The Council has also strengthened 53 Zonal Agricultural Research Stations (ZARS) to assume additional functions of the work of KVKs (ICAR, 2001). ICAR's other programmes include 8 Trainer Training Centres, 70 Institute Village Linkage Programme (IVLP) Centres, and 60 Centres of Technology Evaluation and Impact Assessment. Under the National Agricultural Technology Project (NATP), ICAR is presently establishing 40 Agricultural Technology Information Centres (ATICs), 25 in SAUs and 15 in ICAR institutions. Through the ATICs farmers can get many of the following services from the same place, i.e. through a 'single window'; delivery of research products, information, and other services.

3.4 Private-sector initiatives

India is actively considering various options for limiting public-sector involvement in extension and is contemplating steps whereby to complement, supplement and replace some of its activities by greater involvement of the private sector, both commercial and non-profit (DAC, 2000). The private sector itself exhibits diverse approaches to agricultural extension (Sulaiman and Sadamate, 2000; Chandra Shekhara, 2001). Farmers' associations and producer co-operatives are presently involved in extension for selected crops and commodities.[5] Milk co-operatives in various States provide a number of services to dairy farmers. Other important providers include NGOs, input industries (seed, fertiliser, pesticides, etc), agro-processors servicing contract farmers, such as Pepsico in Punjab; Vazir Sultan Tobacco Company Limited (VST), Natural Products in Andhra Pradesh; media organisations, such as E-TV in Andhra Pradesh and Maharashtra; print media in Kerala; and private consultants (Box 1).

[5] For a detailed discussion on investments and performance of various extension organisations in India see Sulaiman and Sadamate (2000)

Box 1 Examples of private-sector extension in India

Maharashtra Grape Growers' Association (MGGA) is one of the best-known farmers' associations in the country. With an estimated membership of 17,000 growers, MGGA has been the driving force behind the development of grape cultivation in the State. The Association has an independent R&D wing, organises regular group discussions and seminars and publishes a monthly farm magazine on grape farming.

Malabar Regional Cooperative Milk Producers' Union (MRCMPU) is a part of the Kerala Co-operative Milk Marketing Federation, and operates through 429 producer societies. Its Extension Cell organises technical inputs, training and extension, artificial insemination and veterinary services. Under the Women Cattle Care programme, knowledge is transferred through women who act as 'village change agents'. They conduct regular informal discussions and organise formal classes for groups of 20–25 women.

Indian Farmers' Fertiliser Co-operative Limited (IFFCO), Fertiliser and Chemicals Travancore Ltd. (FACT) and *Krishak Bharati Cooperative (KRIBHCO)* are some of the more prominent fertiliser organisations involved in providing demonstrations, village adoption programmes, farmer visits to research stations, and soil testing services.

Kumar Gentech and Tissue Culture Co, Pune provides total extension support from advice on site selection, to technological guidance throughout the growing period and marketing support for those growers buying inputs (seeds) from the company. Agro-processors such as *Pepsico* provide total extension support to its contract growers of tomato in Punjab.

Rallis India Limited, primarily a pesticide manufacturing company and *Mahindra Industries*, primarily a tractor manufacturing firm, are presently experimenting with strategies to provide integrated yield and profitability improvement solutions to farmers by providing knowledge, access to good quality inputs, farm mechanisation services, finance and marketing access. To facilitate farmer interaction and provide these services, they establish centres in the selected districts.

Samaikya Agri-tech Private Limited is a consultancy firm operating in Andhra Pradesh and provide extension services to farmers. The firm provides advice to those farmers registered with the firm on all aspects of farming ranging from crop production to diversification and marketing options. Subject matter specialists of the firm at the district level provide technological back up to the technical officers in the field through on-line connectivity established through computers.

PAN Horti Consultants and *Viji Hi-Tech* are two consultancy firms in Coimbatore District, Tamil Nadu providing consultancy services on agriculture to commercial firms, agro-based industries, and entrepreneurial farmers.

In Kerala, 18 Malayalam (local language) dailies publish regular agricultural columns every week. Farm magazines published by several media firms in the local languages of different states, provide much useful information to farmers. Private TV channels such as *E-TV* transmit daily agricultural programmes in Telugu and Marathi.

MS Swaminathan Research Foundation implements the Information village concept in villages around Pondicherry. Information support on all aspects including agriculture is provided through villagers trained in information technology.

EID-Parry, an established sugar company in South India provides access to websites on agriculture to contract growers in the company's field offices. Apart from information on sugarcane cultivation, the site provides much useful information in the local language on other crops, new technologies, and prevailing market prices.

India has a number of NGOs with varying levels of capacity, implementing a wide range of programmes in several States. They include: *Bharatiya Agro-Industries Federation (BAIF), Professional Assistance for Development Action (PRADAN)* and *Action for Food Production (AFPRO)*.

3.5 Present status

Despite their perennial weaknesses (i.e. diminishing operational support and poor technical background of the majority of its employees), the Village Extension Worker (VEW) of the DoA is still the most important source of information for farmers in India; even though information is clearly targeted to grain production, visits are irregular, and the service is preoccupied with

implementation of public-sector schemes linked to subsidies and subsidized inputs. In the more remote and difficult areas, the DoA has considerable difficulty in recruiting and retaining field staff and often, these areas have large numbers of vacancies and frequent staff turnover (Box 2). The main extension function performed by the state DoA is the delivery of technical messages to individual farmers or farmer groups through visits to specific locations in his circle/area. The extent of satisfaction with the information support provided by DoA varies widely. Farmers' dependence on other farmers and input dealers as a source of information continues to be high.

Box 2 Chronic difficulties facing publicly provided extension in remote areas

The majority of the rural poor in India live in areas weakly integrated into markets. Apart from a few NGO initiatives, the majority of private-sector innovations do not reach these areas, and so the only available extension service is that provided by the State Government. This service is largely dysfunctional because of three types of chronic difficulties:

1. All extension workers are permanent and pensionable civil servants, their accountability to clients is limited, and promotion depends more on number of years in post and than on capability. Most staff consider remote areas to be 'punishment postings' and many, newly recruited into these areas, spend a large part of their time seeking transfer to more-favoured locations. As observed in remote parts of Udaipur district in Rajasthan (Alsop et al., 1999), on an average almost 50% of the posts are vacant.
2. Efforts to 'broad-base' extension are in principle undoubtedly sound, i.e., extension workers should be able to advise on agriculture in its broad definition, and not just on crops, but also on aspects of input supply, processing and marketing and increasingly, on the implications of new market specifications for production and processing technology. However, the capabilities of those willing to live in remote areas are usually limited, and improved impact across such a broad canvas would require long-term re-training (which is rarely available) and more impact-oriented reward structures, which are unlikely to be introduced within a permanent civil service structure.
3. Middle-management tends to be preoccupied with meeting targets that are inflexibly interpreted, lack client-orientation, and uninformed by any kind of institutional learning. As a consequence, field-level agents lack the space to try new ways of meeting client needs.

These three factors suggest that publicly funded, publicly implemented services in the more remote areas of India face chronic difficulties and without considerable reform are unlikely to serve as a basis for greater poverty orientation in extension.

Farmers' associations and producers' co-operatives provide a large number of services, including extension, to farmers but they exist for only a few crops, or commodities and in few locations. The same is true of Commodity Boards. The field extension activities of SAUs and ICAR research stations are restricted to a few villages in their immediate vicinity. KVKs provide a number of vocational training programmes to farmers. With very few exceptions, most of the NGOs are small and their activities, though intensive are restricted to small numbers of beneficiary farmers in a limited number of villages. Consultancy services are few and are mostly private ventures often associated with high-value crops. However, the number of organisations providing integrated yield and profitability solutions to farmers (input, hiring machinery, consultancy and marketing) has been increasing. The potential of mass media is underutilised at present, but the agricultural programmes of some of the private television channels and print media provide sources of information that have high impact on commercial farming. Input companies do not have full-time extension staff. The demonstrations and seminars provided by input companies often in collaboration with the DoA are essentially marketing rather than educational activities and suppliers rarely provide continued (post-purchase) support to farmers.

With the increasing realisation that knowledge is an important input for efficient farming, the institutional diversity in provision of extension services will increase in the years to come. There is also an increasing realisation that 'public extension by itself cannot meet the specific needs of various regions and different classes of farmers' (DAC, 2000). The draft Policy Framework for

Agricultural Extension also affirms that 'the policy environment will promote private and community driven extension to operate competitively, in roles that complement, supplement, work in partnerships and even substitute for public extension' (Box 3). Though the above policy declaration seems to portray a genuine response to the changing times, the practical level of preparedness by the public-sector to work in a multi-institutional environment looks not at all encouraging (Alsop et al., 1999). Privately provided agricultural extension is concentrated in areas of commercial agriculture, and in the very limited areas in which NGOs operate. However, there are several districts where a number of organisations provide diverse extension services, but work in isolation from each other. Certainly, there is little motivation for public extension services to collaborate in any substantive way with others, and such collaborative experiments as have been tried have often foundered on public-sector tendencies to dominate the agenda.

Box 3 Main changes envisaged in agricultural extension provided by Central Government

The policy discussion document released by the DAC in late 2000 envisaged a number of significant changes in the provision of publicly funded extension in India. It must be noted that the primary responsibility to provide extension lies with the individual States, not with Central Government, and so much will depend on the degree of acceptance of these ideas by the States. The fact that Central Government support is envisaged for certain types of change will undoubtedly enhance the prospects of ideas being implemented. Nevertheless, implementation is likely to be [6]slow and uneven, and there is as yet little recognition that a number of the proposed ideas have already been tried with little success, and that others have limited prospects.[7] Nevertheless, this represents an effort to place extension debates into a much wider policy context, and so merits close consideration.

The document's main provisions include:

At the policy level

- A move towards a farming systems approach.
- Partnerships with private and other public agencies in extension provision, including:
  - public funding of private provision;
  - cost recovery for some services;
  - skill enhancement among farmers;
  - linking of technology advice to new market opportunities;
  - local-level accountability of extension workers to farmers.

Institutional restructuring

- Some reduction in the number of village-level extension workers, and instead a focus on small Block towns (a Block being an administrative unit of some 70 villages) where single-window extension services will be provided, using the Agricultural Technology Management Agency (ATMA) model.
- Using participatory Strategic Research and Extension Plans (SREPs) to drive local-level technology generation.
- Extension delivery at the Block town level complemented by strengthened farmer-interest groups capable of creating 'demand pull' on the system.

Financial reforms

- Central Government will contribute towards operation and management costs in future, though salary costs will remain the responsibility of the States.
- Additional public funds will go into a number of new areas, including the payment of honoraria for para-extension workers, and support to NGOs involved in local level group formation.

[6] Extension provision is constitutionally mandated to the States, not to central government. The great majority of extension agents are permanent civil servants, and attrition through natural turnover or redeployment is likely to be slow.

[7] For instance, public sector extension workers in several States have been required to work through farmer groups in recent years, but groups are often formed on a token basis, simply so that a list of names can be produced by the VEW when required by his supervisor.

Strengthening research-extension linkages

- Preparation of SREPs, with efforts to reactivate existing interactions, such as bi-annual meetings between State DoAs and the SAUs, and the national pre-season meeting between ICAR and the DAC.

Capacity building and skills upgrading

- Central Government will support training for extensionists once the States have formulated a Human Resource Development policy for extension.
- Such training will include social science and information technology (IT) components not previously incorporated into training.
- All agencies (public and private) will be networked electronically to State headquarters, the SAUs, and MANAGE.

Mainstreaming women in agriculture

- Women's access to extension and training will be enhanced.
- Male extension workers will be sensitized to the needs of women farmers.
- Civil service rules will be examined for gender bias.
- Access by female extensionists to training will be improved.

Use of media and information technology

- Provision of on-line market information.
- Support to the private sector to establish IT information kiosks.
- Wider use of mass-media for extension.
- More farmer participation in mass-media programmes.

Financial sustainability

- Provisions to privatise the 'private goods' elements of extension, especially in more-favoured areas.
- Provisions for cost recovery.
- Co-financing of extension via farmers' organisations.
- Liberalisation of the regulations governing commercial activities by training centres, etc., to allow profits to be retained.

Changing role of government:

- The role of government is seen largely in the neo-liberal terms of provision of public goods, and the creation of an enabling environment for efficient functioning of the private sector, with separate provision to make good any market failures not otherwise addressed.

Source: DAC (2000)

4. Changing Context of Extension

Coutts (1995) notes that definitions of extension range from a persuasive technology transfer model to that of a facilitative human development model. Between these extremes lie other models including that of extension as an advisory/consultancy (or problems-solving) function, and extension as adult education. A number of developments, namely tighter government finances and economic-reform policies (liberalisation, redefining the role of state and private sector) have changed the way that governments fund and deliver agricultural development. Challenges on the sustainability (depleting natural resources) and trade fronts, World Trade Organisation (WTO) driven, the changing nature of agricultural technology (from public to private goods), rapid developments in IT and a changing development agenda (stakeholder participation, decentralisation and faster reduction of poverty) have prompted a re-evaluation of the role of extension in many countries, including, to a limited extent in India.

4.1 Politico-economic context of farmer decision-making

Public expenditure on agricultural extension and its control have been justified on the basis that support for agriculture leads to reduced food prices and increased food security which benefit the whole population (van den Ban, 2000). More recently, additional rationales for public extension include poverty alleviation, employment creation and environmental conservation, although these have not been explicitly mentioned in Indian policy documents. In a climate of market liberalisation for the maintenance of costly public extension systems, there are important questions about who should fund and deliver extension in relation to each of these purposes. In a multi-institutional environment, it would be efficient for various actors to prioritise their activities based on their inherent strengths and weaknesses. When a market is developing for skilled and specific agricultural advice, government should reconsider its role in this market and evaluate its comparative advantage. It is normally sensible for a government to create conditions in which private suppliers of advice can emerge and flourish. This view has been supported by others who have found merit in limiting the government's role to only those activities that are not provided by the private sector. Moris (1991) states that governments must reduce services to those it can adequately fund, while supporting the private sector in the provision of the remaining services. One approach used to decide who should provide what services, is based on the classification of services according to its economic character, using the principles of substractability and excludability.[8] Private firms are unwilling to supply services with public-good characteristics because it is impossible to restrict the benefits only to people who pay for those services (the free-rider problem). Thus, private enterprise will be willing to supply any good or service that can be sold for profit. The implication is that the public sector should focus its funds on the public-good components of extension. In turn, publicly funded extension either can be supplied by the public sector or be contracted out to private (commercial or non-profit) organisations, or be delivered through public–private partnerships of various kinds.

Van den Ban (2000) argues that whether the extension function is public or private depends on the context in which it is used. In theory, advising farmers on the optimal quantity of fertiliser is site- and farm-specific, and therefore private, and chargeable. But, training farmers in the use of soil-testing equipment is an educational function for which public funding may be justified. This difference is critical, because by stepping back from the problem to its underlying cause, not only

[8] Excludability applies when access is denied to those who have not paid for the product, while substractability (rivalry) applies when an individuals use or consumption of a good or service reduces its availability to others. Public goods are those having low substractability and excludability, whereas private goods are those having high substractability and excludability. Purely public and private goods occupy opposite ends of the economic spectrum. In between the two extremes, are toll goods and common-pool goods.

does the nature of the good change, but also the value of the information increases to the extent that it becomes empowering.

But, though private enterprise may be willing to supply a good or service, it is in many cases unable to step into the role of provider because the environment (in terms of infrastructure and information) needed for business to function is lacking, or the market is dominated by monopolistic interests, or (as in the case of insurance services) because of the extreme levels of risk involved. Consequently, governments are also faced with the task of creating a suitable environment for commerce, which further diverts funds away from direct support to farmers. The net result is that the public sector takes on a complex of different roles ranging from provider to co-ordinator, facilitator, arbitrator, regulator, and guarantor (of transparency). As argued above, efforts to maintain permanent public officers at village level in difficult areas face chronic difficulty. Bearing this difficulty in mind, the government's ability to deliver quality public goods through its own staff needs to be evaluated. While the private sector could not be expected to fund these types of services, they can certainly be contracted to provide them. In the Indian context, this would help government in keeping down the number of public-sector staff, and in wielding more flexibility in staff deployment.

Some government policies towards weakly integrated areas in India amount to unmanaged forms of triage. This implies the neglect of such areas relative to others, and as a result, the population might move out spontaneously to seek livelihoods elsewhere[9]. A classic example of focussing resources on well-integrated areas was that provided by the Intensive Agricultural District Programme (IADP) in 18 districts in 1960, when India was reeling under food shortages, and it was essential to have quick results on the production front.[10]

But in many cases, where triage does exist, it is the product more of poor implementation rather than policy design deliberately geared against areas weakly integrated into markets. States, regions and districts that are relatively less-developed (e.g. rainfed) remote (hill and desert areas) and have a high proportion of the population belonging to weaker sections (tribal people) have recently been the focus of specific government plans, such as the Panchayat Extension to Scheduled Areas, and programmes for drought-prone areas, deserts and watershed development. But the implementation of these schemes remains weak mainly due to lack of participation.

In such aspects as: the lack of participation in selection and implementation of programmes, uniform implementation guidelines, the lack of voice among the poor, and inadequate personnel to implement programmes. What is needed for the future is recognition that:

- there will be outmigration from the more remote areas, and so there is a need to support migrants, and to regulate the pace of migration consistent with absorptive capacities;
- there are agriculture-related possibilities, but that these are not driven by productivity enhancement alone, but also by requirements to reduce vulnerability and generate employment opportunities;
- agriculture alone is unlikely to be sufficient for the livelihoods of the poor – support will also be needed for non-farm enterprises, and to improve access by poor people to services and employment opportunities in nearby towns.

[9] By contrast, managed forms of triage would, for instance, monitor how adequately such labour is being absorbed elsewhere in the economy and would seek to provide incentives or restrictions such that the volume of labour flows is consistent with available opportunities.

[10] 18 districts having assured water supply, minimum natural hazards, well developed institutions like co-operatives and panchayats and maximum potential for increasing agricultural production within a short time were selected for implementing the programme.

4.2 Farmers' changing needs for information and advisory support

Farmers need to be supported with information, knowledge, and the skills to adopt improved technologies that result in improved farming with characteristics that are productivity enhancing, vulnerability reducing, and employment creating. However, the requirements of farmers and rural families go beyond agricultural production technologies. Changes in recent years, not least the increasing penetration of markets into rural areas and the need to tailor products to ever more stringent market requirements means that extension support must now address a broader range of farmer objectives that include:

- choice of technological options appropriate to available land, capital, labour and knowledge resources;
- management of technologies, such as the optimal use of new inputs;
- decisions about how and when to change enterprise or farming system, such as diversifying from crop production to mixed farming or vegetable or animal production;
- assessing both domestic and foreign market demand for products and product quality criteria within these markets, such as food safety and organic criteria;
- sourcing reputable suppliers of inputs and forging trust-based alliances with them;
- cooperation between small-scale producers to increase their presence and power in the market;
- sourcing readily accessible and accurate information on an on-going basis;
- assessing the feasibility of off-farm and non-farm income generation opportunities to provide long-term benefits;
- assessing the implications of farm enterprise in relation to changing policies on input subsidies and trade liberalisation. (van den Ban, 1998).

Against this context, publicly funded extension in India in the 1990s took on board new goals of natural resource management (especially watershed management, participatory irrigation management, etc.) and diversification. The need for a group approach to extension and the importance of producer groups (farmer interest groups, commodity associations etc.) were also recognised, but many to these changes remained at the level of planning and rhetoric. For the reasons relating to the characteristics of public- sector extension services outlined above, success at the operational level has been limited. Reducing poverty, or the vulnerability of the poor, has never been explicitly stated as a goal of extension, and there have been no specific extension programmes to target the poor. (In the case of distribution of subsidies and subsidised inputs, programmes often target small-scale and marginal farmers). But with the overall policy focus shifting to reduction in poverty levels, extension can no longer afford to ignore the poor.

A focus purely on increased food production is not enough to solve the problem. Several districts in India with high agricultural productivity levels also have high levels of poverty (Haque, 2000). Food assistance programmes, though important in times of crisis, do not address the basic cause of the problem.[11] In many areas, there are limits to achievable increases in productivity unless appropriate institutions that can help farmers to access information, inputs, and service are strengthened, and joint action for natural resource management, marketing and processing are promoted. Often, other livelihood options need to be explored to improve income (and thereby access to food) and extension can and should meaningfully contribute to attaining these goals.

The poor face substantial transaction cost in accessing means of production, in adding value to their produce, and in accessing markets for it. The core of extension is in helping people make better choices through the supply of information and in the enhancement of people's capacities to process

[11] One of the reason for the mounting food stocks with the government has been the low demand for these grains, as the poor (and poor States) lack the purchasing power to buy them.

such information and act on it, and thereby reducing the transaction costs involved in pursuing livelihood options. But transaction costs impact disproportionately on the poor, due to the access problems caused by weak infrastructure, poor organisations, and adverse local power relations (Christoplos et al., 2000). The intensity of these problems varies widely and so there cannot be a single blueprint. Moreover, the cultural contexts vary significantly and so approaches to reduce vulnerability vary from district to district and often within the same district. Solutions for reducing poverty rarely lie in the transfer of production technologies but often in improved access to information on wider livelihood choices and institutional support (such as micro-finance, micro-enterprises, entrepreneurship development, market access, etc). Extension needs a higher level of flexibility and wider range of expertise to choose and assist the poor with these various options.

5. Constraints on Innovation and Diversification in Extension

Extension in India has moved towards plurality in provision. As part of this process, it is essential that government show willingness to systematically document public- and private-sector institutional innovations and draw lessons for the replication of best practice. Currently this policy is sadly missing. A number of generic issues still plague many of these experiments in institutional innovation and these need to be addressed before replication on a wider scale. The key issues in the Indian context are discussed below.

5.1 Scale and complexity

The Indian extension system has to cater to the needs of about 90 million farm holdings, 70% of which belong to small-scale and marginal farmers. Public-sector extension employs about 100,000 workers. The ratio of extension workers per farm family varies from Kerala at 1:300 farmers, to Rajasthan at 1:2000 farmers. Taking account of non-public providers does not change these ratios appreciably. The DoA continues to be the only agency with a presence in all the districts. Even though it is not necessarily the primary source of information for farmers, with continued reliance on individual or group contact and little multiplication of impact through mass media, information coverage remains unsatisfactory. In remote and difficult areas, both public- and private-sector presences are weak. While the public sector has difficulty in retaining field staff, the private sector finds these areas unattractive for investment.

Given the wide variation of agricultural enterprise, productivity levels, non-farm opportunities, infrastructure, and poverty levels across and within States and districts, the current uniform approach to public extension within a State or a district is inappropriate. District extension managers must be given greater flexibility to design and use different extension approaches, and the freedom to identify strategies that could reduce the vulnerability faced by the poor. They also require more flexibility in deploying funds and staff. Presently this flexibility is lacking as the overriding philosophy of government continues to be strict adherence to uniform prescribed guidelines. The system of reporting and lack of incentives for experimentation further discourage any institutional innovation.

To make effective decisions, farmers need information from a wide range of sources, on both farm and non-farm topics. But the public sector continues to provide information only on technologies generated in public-sector research stations and mostly on food grain crops. Efforts to respond more adequately to the diverse needs of small-scale and marginal farmers remain weak.

5.2 Linkages

To date only research–extension (R–E) linkages have been emphasized and measures to improve them have not yet yielded positive results (for detailed discussions on linkage issues see Kaimovitz, 1991). After two decades of efforts to foster linkages, information flow is still mostly top-down (Macklin, 1992) with feedback too weak to catalyze the fundamental changes required in the prioritization of on-station research (Jha and Kandaswamy, 1994). DAC has recently devised fresh guidelines for establishing R–E linkages under the Innovations in Technology Dissemination (ITD) Component of NATP. But even these are the product of the linear, mechanistic model of innovation that has outlived its utility and are unlikely to change the situation on the ground, especially for the vulnerable. Understanding the need for a holistic system, and of actor-oriented approach to

innovation continues to elude policy makers (for discussions of the linear vs systems model of agricultural innovation see Biggs, 1990).

Even within the R–E system, linkages between organisations working in the same subject area are weak and this severely constrains the performance of the system as demonstrated by recent case studies from the Indian horticultural research systems (discussed in detail in Hall et. al., 2001) Inter and intra-departmental co-ordination for programmes in both ICAR and SAUs are weak. (ICAR, 1996). Linkage between KVKs and State DoAs is less than satisfactory and the DoA continues to ignore other organisations that have entered the extension arena in selected regions and enterprises that could complement or supplement its efforts.

Linkages between public-sector extension and institutions whose polices have a direct bearing on extension – input supply, credit and marketing systems – are virtually non-existent. Nor can public extension influence policy on investment, research prioritization, infrastructure, public administration, or technical education. Public extension thus continues to be a passive recipient and often a victim of decisions taken in these systems.

5.3 Operational resources and fiscal sustainability

Inadequate operational funds have been a perennial weakness of public-sector extension. Macklin (1992) noted that the level of operational funding in the T&V system had not been maintained in real terms, and thus reducing the mobility of extension workers (Macklin 1992). Swanson (1996) estimated operational expenditure in State DoAs at around 15% of total expenditure; considerably less than the level considered necessary for a fully functional extension system.[12] More recently, a study across four States revealed that salary alone accounts for 85–97% of government expenditure on the State DoA (Sulaiman and Sadamate, 2000). This has resulted in serious under utilization of facilities and personnel. Its origins lie in the fact that, under Indian civil service codes, budget cuts cannot be translated into redundancies, and so are borne entirely by operating budgets.

The problem is a vicious circle of fiscal difficulty, curtailed services, inefficient operation, depressed performance, staff demotivation, and reduced competence (Ameur 1994). Increasing budgetary constraints within States have had a knock-on effect on central DoA budgets and questions are being raised as to the financial sustainability of the vast extension infrastructure in India (DAC, 2000). Measures to recover at least part of operational expenditures are slow to be adopted because, despite some indications of willingness to pay for services (48% of farmers are reportedly willing to pay for extension in horticultural and high-value crops (Sulaiman and Jha, 2000), the quality of available services is too low to meet demand. Currently, political sensitivity surrounding the issue prevents the introduction of measures that could capitalize on farmers' willingness to pay, and that would otherwise enable a cost-recovery strategy to gain momentum.

5.4 Conceptual problems

The major factor underpinning the above generic problems is the lack of agreement on the goal of extension, the objectives needed to achieve this goal, and the role that different organisations can play in pursuit of these objectives. Many of the organisations that are already involved have too narrow a view of extension, and this limits their ability to mobilise around farmer needs on the one hand, and explore opportunities for collaboration and synergy on the other. Extension is still viewed as the transmission of technology, information, or materials such as seeds to farmers in order to

[12] Swanson (1996) consider a fully functional extension system to have 30–35% of its total expenses as operational expenditure.

introduce technical changes in agriculture that are considered desirable, without taking into consideration farmer livelihood options and resources. This inhibits the promotion of farmer dependence from public extension (van den Ban Hawkins, 1998). But the role of extension is much wider, since it also needs to teach management and decision-making skills, help rural people develop leadership and organisational skills, enabling them to organise better, operate and/or participate in co-operative societies and other support organisations, and to participate more fully in the development of local communities (Swanson and Clarr, 1984).

MANAGE has recently articulated that public-sector extension in India in addition to the technology transfer should embrace such other roles as human resource development, broad-basing and farming system perspectives, and gender differentiated-strategies (MANAGE, 1993). But, on the ground there are few and dispersed attempts to embrace any functions other than transfer of technology. DoA field workers are implementing programmes for distribution of subsidised inputs[13] and have little time left for analytical field visits or participatory problem solving with farmers. This is not a surprising outcome since it has been estimated that, administration for scheme implementation and meetings with higher officials consume 60% of the working day for both agricultural officers and assistants (Jinraj, 1999). The much-publicized group approach embraced by the DoA resulted in the formation of a number of such groups, but most of these remain dysfunctional and inactive due to lack of clarity of purpose, and follow-up support for the groups' activities (Jinraj, 1999). This is not a surprising outcome since staff do not have training in the sort of business and social science skills that makes support effective. Organisations that have been successful in this regard, for instance the KHDP, specifically recruited personnel who could provide this expertise and also contracted out training for group members (for more information see Isvarmurti, 2000).

Though the availability and diffusion of appropriate technologies continue to be a challenge for the extension system, in the majority of rainfed and other disadvantaged areas, the wider adoption of technology necessitates collective action by farmers. Since many technologies suited to rainfed agriculture are knowledge-based and need community action, for example, integrated pest and common property resource management, farmer groups have to be sustained at grassroots level. This is also essential if part of the extension function is to be transferred to farmer groups in the long term. Unless extension expands beyond the ToT mode, its relevance and utility for farmers will remain in doubt, and public support and commitment will decline further.

According to van Beek (1997), extension needs to move beyond ToT to embrace such roles as problem solving, education, and human development.[14] None of these four functions should be left out when designing or evaluating an extension project. Extension needs an increasing level of people oriented skills as it moves along the continuum from ToT to human development. Debate on the extent to which the Indian extension system is prepared to take on these responsibilities is long overdue.

[13] Most of the central and state sector agricultural development programmes has a component for providing subsidized inputs or subsidies to participating farmers in that particular programme. For instance, seeds/seedlings (promotion of new varieties or crops), pesticides and equipments such as sprayers (control of some specific pests in a particular crop), bio-fertilisers (promotion of bio-fertiliser application) etc are provided through DoA. Cash subsidies are provided for construction of wells, implementation of drip irrigation, purchase of equipments such as tractors through the DoA.

[14] van Beek (1997) has defined these four roles as follows: *technology transfer* which links research in ones discipline with users; *problems solving*, which assists clients with solving individual problems; *education*, which aims to empower people to solve their problems; and *human development* which encourages people to govern themselves and develop their learning capability

5.5 Human resource capacity

Several organisations with varying resources and professional capabilities exist in India, but the performance of public-sector extension agencies in integrating knowledge and skills from these various sources has been limited. The ability of extension agencies to assess and refine their knowledge base is poor and this is largely due to the low level of qualification required of employees.

There is now a fairly broad consensus that poorly trained village extension workers would not be able to deliver appropriate standards of service in the changing extension environment. In total, States employ some 100,000 extension staff of whom only around 20% are graduates. Some States have already taken the decision that degree level should be a minimum qualification for appointment in the DoA. But this is not enough. DoA employees need skills in rural management, social mobilisation, training, finance, credit, and marketing, amongst others, in addition to agricultural science.

Though enforcing graduation in agriculture as a minimum qualification at entry level is to be welcomed, the fact remains that agricultural graduates also lack many of the social science skills necessary for field extension work.[15] Postgraduate training in agricultural extension does not address many of these skills (Sulaiman and van den Ban, 2000a). As extension performance depends considerably on the quality of agricultural graduates, the extension system should find ways to address the content and quality of agricultural education.

A universal ban on recruitment in the VEW cadre, before alternatives have been adequately tested (such as efforts to base extension in Block towns and stimulate farmers' capacity to draw on such services) would be premature. Experiments in introducing PEWs also need to be handled carefully: experience from Uttar Pradesh suggests that the *kisan mitras*, (who are selected from practicing farmers) after a single-day training programme before each season are unable to provide any better information/advice to farmers. Clearly, any PEW-based scheme would have to be better designed and implemented than this, and the ways in which it would draw on public extension resources would have to be clearly defined.

Several States also lack competent subject matter specialists (SMSs) at district level, a major factor that contributes to poor research-extension linkages and lack of integration across crop and livestock systems. Such constraints severely limit the capacity of the technology dissemination system to assist farmers in using improved production practices or incorporating higher-value commodities into their farming systems (Sharma, 2000).

Many of the questions on capability and future preparedness of different extension organisations depend on a clear definition of the roles that extension organisations will play. A comprehensive evaluation of the extension capabilities available within different organisations in the public and private sectors needs to be made. Public-sector infrastructure and expertise could be productively used to enhance the capability of private extension providers. Similarly, public-sector extension can gain expertise on private-sector technologies and products, if partnerships can be established between these different agencies. Capacity building in extension needs to make an inclusive analysis of all possible organisations so as to improve the collective performance of the extension system.

[15] DoA staff need skills related to group formation, leadership development, conflict resolution, inter-group negotiation, and management of common property resources. For more details see Farrington et al., (1998)

6. The Way Forward

For areas weakly integrated into markets, the following would represent an ideal extension scenario:

- recognition by agricultural policy that, though productivity enhancement is important, it needs to be designed and implemented in ways that reduce vulnerability and create employment;
- recognition by rural development policy that agriculture alone (even in the broad definition used here) will be insufficient to generate the wide range of livelihood options that would be of value to the poor, so that public resources would be invested in the development of small and medium scale towns, and in transport and telecommunications infrastructure so that the poor could easily access the employment opportunities and services (whether or not agriculture-related) offered by government and private agencies in these towns;
- the strengthening of high-level skills in particular agriculture-related subject areas in small and medium towns, but with all specialists located in a single office and with close links to the private sector, so that visitors can easily be guided to the most appropriate source of information;
- close integration between such information sources and the providers of training, so that training curricula can constantly be updated to reflect the types of information that farmers are request;
- efforts to build capacity among the poor to enhance their participation in the design of technology change programmes and to make demands on extension services, input suppliers, etc.;
- outreach from small towns to villages to support farmer-to-farmer exchange of information and experience, and farmer experimentation;
- a switch in public funds out of the better-integrated areas (where there are good prospects for much extension to be privately supplied and funded) into weakly integrated areas where market failures predominate;
- the identification of market failures in such areas that the public sector has some prospect of rectifying (and over what period), plus the identification of what will remain public goods in both weakly and well-integrated areas (information and training on soil and water conservation and other environmental concerns, together with health, nutrition and safety matters are likely to be fall into this category);
- the development and implementation of a strategy to redress market failure over a defined time period and to provide public goods in ways that respond to the needs of the poor;
- the replacement of civil service VEWs by private extension agents at village level, which nonetheless will be publicly funded to some degree.

A consultation document recently released by the GoI/DoA (Box 3) contains provisions that correspond closely with the above – except that it sees little movement away from productivity-dominated agriculture policies. The main question that concerns us here is how easily implemented such an approach would be. Certainly, the evidence reviewed above suggests that progress towards an ideal of this kind is likely to be slow in India. In what follows, we recapitulate the reasons for this, indicating likely patterns of change (and resistance to change) and suggesting a number of second-best options that might be pursued at various points.

6.1 Factors underpinning the slow pace of change

Many of these have been outlined earlier. In summary, they include:

- the large size and diversity of the country; the division of responsibilities for research and extension between Centre and States in ways that impede feedback on new requirements, responsiveness to these, and accountability to the users of new technology;
- deep-rooted perceptions of social status, that place research above extension, and many categories of the rural poor (Scheduled Castes, Scheduled Tribes, Other Backward Castes) at the bottom of the hierarchy, thereby limiting the effective interaction among them;
- the parallel operation of publicly funded publicly implemented State extension services, all operating in isolation from each other, so that cross-learning is minimal, and the fact that they all engage permanent civil servants at all levels of the extension hierarchy;
- the lack of institutional learning, so that there are no consistent means of incorporating lessons learned by VEWs into new practice or policy;
- the prevalence of civil service behavioural norms across the hierarchy, including the pursuit at all levels of what may be locally inappropriate targets, the rigid interpretation of norms, leaving local workers little room for manoeuvre, the absence of substantive rewards linked to performance in responding to clients' needs, frequent transfers, and reluctance to serve in what are perceived to be punishment postings;
- the absence of social science skills among extension agents;
- the absence of mechanisms to protect farmers from unscrupulous behaviour among private traders, and (as yet) of self-regulatory provisions among, for instance, input suppliers.

6.2 Ideals and constraints: re-conceptualising the role of public extension

India's acceptance of a World Bank/Inernational Monetary Fund (IMF) Economic Reform Programme in the early 1990s stimulated a wide-ranging reconsideration of the role of the State and of fiscal regimes (including subsidies). Much of this debate was limited to the industrial and 'modern' service sectors of the economy, and even here, there has in practice been only a limited rolling back of restrictions on private sector development. Saxena (2001) outlines some of the remaining restrictions affecting agriculture, and, certainly in relation to small-scale and marginal farmers the old caricatures of near-helpless farmers, villainous private sector, and benevolent state remain firmly fixed in policy design and implementation. It will be many years before these begin to break down and a well-regulated private sector in such areas such as seed provision comes to be recognized as potentially of benefit to the rural poor.

Within public extension, ToT remains the dominant paradigm. Debates on the Knowledge System Approaches in extension brought into focus the diverse sources of information and innovations and the need for stakeholders to be involved in all phases of the development of an innovation. This has led to the development of a number of participatory approaches as an alternative to the dominant ToT approach (discussed in detail by Chambers, 1993). This triggered a large number of experiments in Farmer Participatory Research and Extension (FPR&E) or Participatory Technology Development (PTD). Despite such experiments, agricultural scientists all too frequently find themselves struggling to apply participatory approaches in an institutional and professional context that implicitly denies such patterns of interaction with clients (Hall and Nahdy, 1999). Though extension could potentially have contributed to such experimental approaches as PTD, the social distance between the research and extension systems has so far prevented them from undertaking any joint activities.

The need to address the institutional dimensions involved in technology development and the importance of an inclusive analysis that examines the knowledge flows and levels of interaction among all the actors in the innovation system[16] became more evident in the late 1980s. The emergence of the National Systems of Innovation (NSI) framework (Freeman, 1987, Lindwall, 1998) was a response to this issue. Analysis based on the NSI approach stresses that it is the performance of the system as a whole that is important, success tending to be a function of interaction and interactive relationships – often partnerships – that determine the effectiveness of knowledge flows between institutional nodes.

Several of the institutional innovations that have emerged in response to weaknesses in public-sector research and extension, have given enough indications of the emergence of an agricultural innovation system in India. This has resulted in blurring of the clearly demarcated institutional boundaries between research, extension, farmers, farmers groups, NGOs and private enterprises. Extension has to play a very important role of facilitating the nodes to generate, access, and transfer knowledge between different entities in the innovation system. It also has to create competent institutional nodes to improve the overall performance of the innovation system. Inability to play this very important role will further marginalise extension.

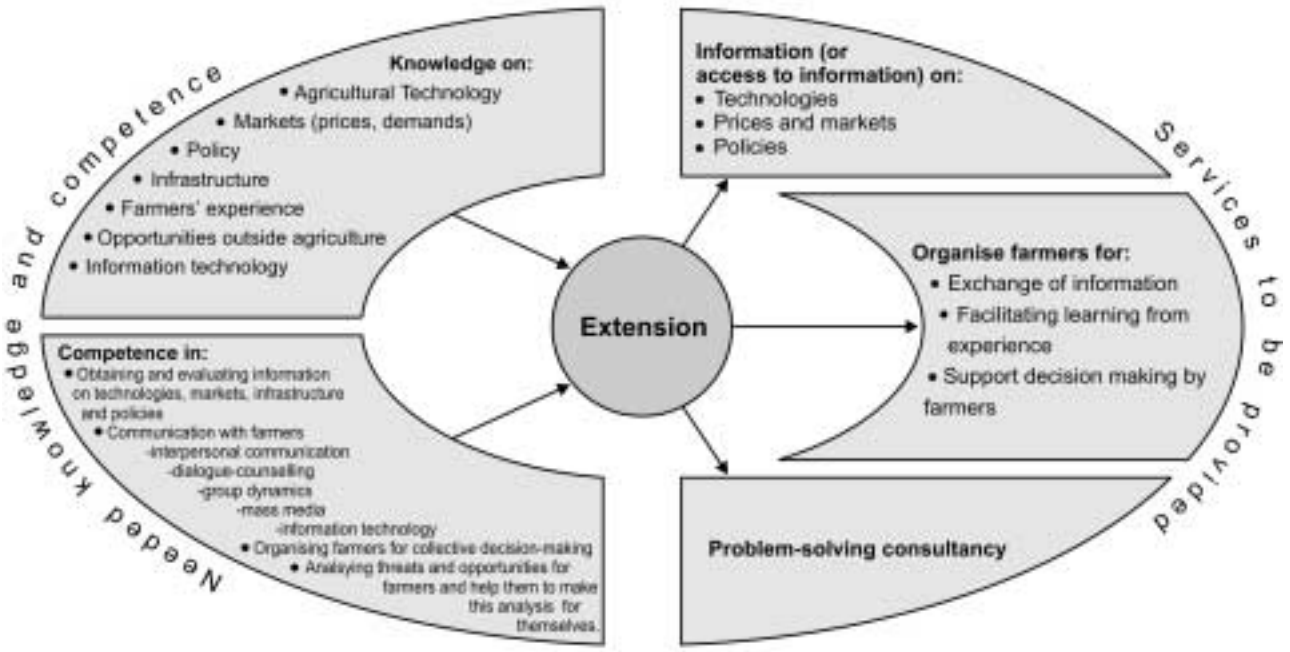
6.3 Ideals and constraints: enhancing skills

In order to provide problem-solving consultancy and initiate measures to mobilise farmers, the public extension system needs knowledge and competence in a number of areas (Fig. 2). To remain relevant and useful in the years to come, public-sector extension has to strengthen its understanding of technology, markets, prices, demand, and policies; either by recruiting specialists or by contracting out these services. The latter option might be preferable because it would ensure optimum use and accountability. Whatever public/private division of responsibilities is chosen, a sound Human Resource Management Strategy is required. This needs to be based on a clear analysis of present and future knowledge and skill requirements, the roles and responsibilities for individuals and teams, matching qualifications with the positions required, clear polices on recruitment, selection, placement and promotions, and in-service training.

Human Resource Development (HRD) has been much talked about and the time is ripe for a continuous HRD programme to be put in place. But, it is important to emphasise that, unless reward structures are right, and unless the trainers themselves have the prerequisite knowledge and skills, little improvement can be expected from a staff-training programme. In several cases, training posts are being filled through promotion from the lower ranks of DoAs. Where there is freedom to appoint from outside the organisation, the low status and salary of the appointments has deterred potential applicants. Setting up autonomous training bodies, as suggested by DAC, may be an interim step towards solving this problem.

[16] An innovation system encompasses all the elements of the system or network of private and public sector institutions whose interactions produce, diffuse and use economically useful knowledge. In this way, this type of analysis is more inclusive then the narrower notion of a research or extension system.

Figure 2 Future roles and competence for extension



Source: Sulaiman and van den Ban, (2000b)

6.4 Research organisations' extension role

SAUs and ICAR institutes are engaged in some limited extension activities. All SAUs have a Directorate of Extension engaged in training, publicity, and advisory services. SAUs in Punjab and Andhra Pradesh have created mechanisms for one-to-one interaction with farmers at district level, primarily to provide problem-solving advice. ICAR institutes provide training on technologies developed by the institute, mainly to officers of the line departments but also to farmers. The relatively new Institute Village Linkage Programme (IVLP) is a vehicle for technology assessment and refinement (TAR) at village level by a multi-disciplinary team of scientists.

ICAR's increasing involvement in extension activities has been of concern to the Council for quite some time. Questions have been raised as to the increasing share of the budget allocated to extension, and on the logic of continuing full funding for KVKs. The role of social scientists in general and extension scientists in particular within research institutes therefore needs clearer articulation, especially considering that their potential usefulness in technology development is not being realised at present. Perhaps extension scientists could be better employed in developing new institutional arrangements and linkages within the R–E system, and partnerships with outside organisations. To remain relevant, extension in research institutes should broaden their role from promotion of technologies to facilitate technology development (contributing crucial social-science perspectives) and application (experimenting with institutional innovations and facilitating linkages within the innovation system).

6.5 Public-Private partnership in TOT

There is an increasing realisation that, 'Public extension by itself cannot meet the specific needs of various regions and different classes of farmers. Policy environment will promote competitive private and community extension to operate effectively, in roles that complement, supplement,

work in partnership and even substitute for public extension (DAC 2000). Though this declaration seems to portray a genuine response to the changing times, the level of preparedness in the public sector to work in a multi-institutional environment is not encouraging. The GO–NGO collaboration experiment for sustainable agricultural development implemented in Rajasthan revealed a number of issues that emerged when government and NGOs were brought together to work in a collaborative mode, including the pervasive perception in government that NGOs should merely be contracted to provide services, but a perception among NGOs that their strength lies more in mobilising people to make demands on the system (Aslop et. al., 1999).

Private sector involvement in extension is not uniform across the country. In some districts, a number of private organisations work in isolation providing diverse services, but there is as yet no inventory of these, that would allow contact to be made and possible alliances forged. As long as the major responsibility of the DoA continues to be implementation of schemes, they will see no reason to link with the private sector. Neither does past experience of R–E linkage inspire confidence in the partnership approach. Partnerships by definition require sustained efforts over time to build and maintain good working relationships. As a first step, a series of activities to inculcate the right attitude for building close working relationships with other organisations needs to be arranged for extension managers. Case studies based on real documentation from examples of successful partnerships disseminated between regions would also act as a springboard for discussion around the concept, operation, pitfalls and potential of partnerships.

Use of the term 'privatisation' has created confusion amongst public extension personnel. The draft policy framework for Agricultural Extension prepared by the DAC and Co-operation calls for an increased participation of the private sector in agricultural extension, but the response of State governments has not been encouraging, though most often for the wrong reasons. Many States have expressed strong reservation about the idea of private participation in extension due to the profit motive of the private sector, the lack of ability of farmers to pay, the lack of an effective private sector, and the need to preserve the 'authenticity' of agricultural research derivable only from an 'impartial' public sector.[17] The fact that privatisation is an umbrella term covering several options by which to improve efficiency and effectiveness has not been fully appreciated, and awareness of the mixed success that has been reported for privatisation strategies internationally, further impede the adoption of such a strategy.

Though private-sector participation in extension in India is currently limited to only a few crops and geographical areas, the increasing number of private entities, such as NGOs, farmers' associations, producer co-operatives, input agencies, agro-processors (especially for contract growing schemes), private consultants and the media offers much scope for supplementing and complementing public-sector extension. As farmers are also willing to pay for value-added services, the challenge is to create quality services so that cost recovery can commence. In an increasingly complex environment, there are a number of responsibilities, such as the designated public goods, which remain the domain of the public sector, though in reality the boundary between public and private goods is not so clear as the literature suggests. For these services to be funded primarily from the public purse does not necessarily require them to also be delivered through public infrastructure. The more the institutional pluralism grows, the greater the need within the public sector for clear mission statements, goals and strategies so that privatisation options are used to best advantage.

[17] Workshop 18-19 January, 2001 convened to elicit the views of State governments on the DAC policy document

6.6 Organisation and management (O&M) reforms

Organisation and management (O&M) reforms are long overdue. O&M reform involves decentralisation of responsibility; delegation of authority to district managers and teams; autonomy in routine decision-making; project-based funding; jurisdiction for contracting out services; expertise and facilities; transparency of policies and budgets; and separate budgets for operational expenditure.

There are currently no effective mechanisms to achieve accountability in the public sector since it is subject to the rules and regulations of the civil service. Consequently there is very little scope for applying a performance-related system of incentives at the present time. Evaluation remains subjective and there is an urgent need to evolve objective performance indicators and transparent means for implementing them.

There needs to be a reduction in the number of Central-sector programmes that are often implemented under uniform operational guidelines. This issue is now receiving attention and Central Government is implementing a macro-management approach, which allows States to select programmes for implementation. It would be ideal if States were also to start adopting this approach for their districts.

A professional O&M review of the DoA at the State and district level should be conducted. Performance evaluation of externally funded programmes would also help to identify factors contributing to successful performance.

6.7 Client involvement in planning and management

Much is said about the importance of involving clients, but in practice such involvement is often a token gesture. Commonly, farmers are invited to some meetings and are made members in some committees.[18] Peoples' representatives have been used to guide and monitor the activities of the public-sector extension in such states as Kerala. ATMA also provides opportunities to bring client needs into the system through Farm Information and Advisory Committees (FIACs). FIACs are expected to increase accountability but in societies that are deeply divided along communities and castes, this type of client representation is unlikely to be truly inclusive. In most regions and for most crops clients and their representatives are in any case too weak to articulate their concerns. The public sector has a primary duty to give clients a voice through the formation of strong farmers' organisations, but in reality the capacity of the public sector to help in organising farmer groups has proven weak, and there are not enough NGOs to take on this role in more than a small percentage of the areas that require it.

6.8 Application of information technology (IT)

Information technology has much to contribute to improving the efficiency and effectiveness of extension systems. The spread of Internet access has created considerable interest in 'cyber extension'. (for details of the possibilities and potential see Sharma, 2000). The excitement generated by IT has tempted many to consider opening more Information Kiosks (or IT parlours), and to develop on-line connectivity to ICAR and SAUs, to compensate for the weaknesses of public extension. But, it should be noted that IT is a useful complement to, but not a substitute for field

[18] Usually these are well educated resource rich farmers who may not quite understand the problems of the resource-poor subsistence farmers

extension. Research has clearly shown that information supplied through the media is helpful only in the initial stages of technology adoption and that a more-detailed interaction is required in the later stages of the adoption process (van den Ban and Hawkins, 1990). Furthermore, poor infrastructure, high levels of illiteracy and absence of software in local languages constrains the usefulness of IT for vulnerable farmers. But human-mediated computer systems shared among multiple users of a rural community could infact prove to be the most inexpensive and inclusive form of rural infrastructure possible today (Sood, 2001). Conversely, IT has a lot of potential to improve the quality and competence of the R–E system and for provide greater access to market information (through networking of markets) and far more attention needs to be given to this.

7. Conclusions

The post T&V period has seen experimentation with diverse extension approaches by a large number of extension providers. But most of them have not addressed the generic problems facing extension in India. The basic issue underpinning many of these has been the lack of a clear articulation of what should be the role of extension in the Indian context. Public-sector extension has to look beyond ToT roles. With the changing developmental agenda, extension in India will have to devise strategies for facilitating the poor to pursue broader livelihood options in on-farm and non-farm sectors so that their vulnerability could be reduced. There is clear recognition in the DAC consultation document of the need to adopt new visions for extension along these lines, to use Block towns (rather than VEWs) as the locus for improved services (that can be closely linked with private-sector activity), to engage in multi-agency partnerships, and so on. However, this vision faces severe and longstanding implementation problems. Given the complexity and intractability of these, a wide-scale transformation of what is still predominantly publicly funded and publicly implemented extension in India is likely to take at least a decade. The poor would benefit substantially from efforts by innovative civil servants, NGOs, and donor-supported projects to accelerate this process of change.

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