Agriculture

Introduction

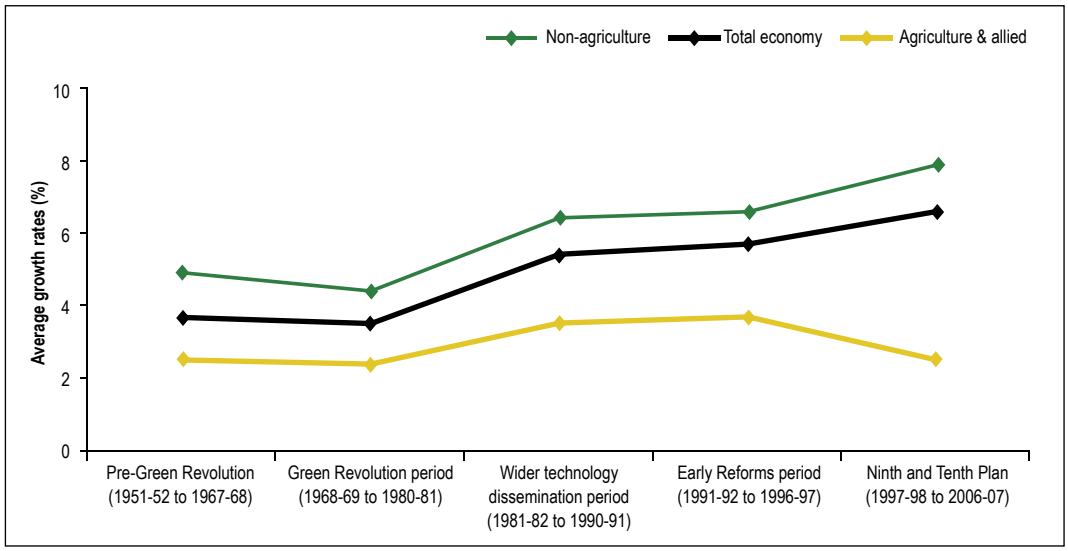
Agriculture is the principal means of livelihood for over 60 per cent of India's population. Despite a steady decline of its share in the GDP (from 36.4 per cent in 1982-83 to 18.5 per cent in 2006-07), it remains the largest economic sector in India. Low and volatile growth rates plaguing agriculture are symptomatic of agrarian crises in several parts of the Indian countryside. Public investment in agriculture has declined and this sector has also not been able to attract private investment because of lower/unattractive returns. A well thought-out strategy for promoting agricultural growth is essential for both alleviating poverty and achieving food-security at the national level. Generation and application of knowledge – through agricultural research and extension services can play a crucial role in meeting the above objectives.

Current Scenario

Research: The Department of Agricultural Research and Education (DARE) is responsible for addressing agricultural research and education needs in the country. This responsibility is discharged through the Indian Council of Agricultural Research (ICAR), an apex and autonomous organisation for agricultural research and education. The DARE has an extensive network comprising 48 Central Institutes, 5 National Bureau, 12 Project Directorates, 32 National Research Centres and 62 All-India Coordinated Research Projects.

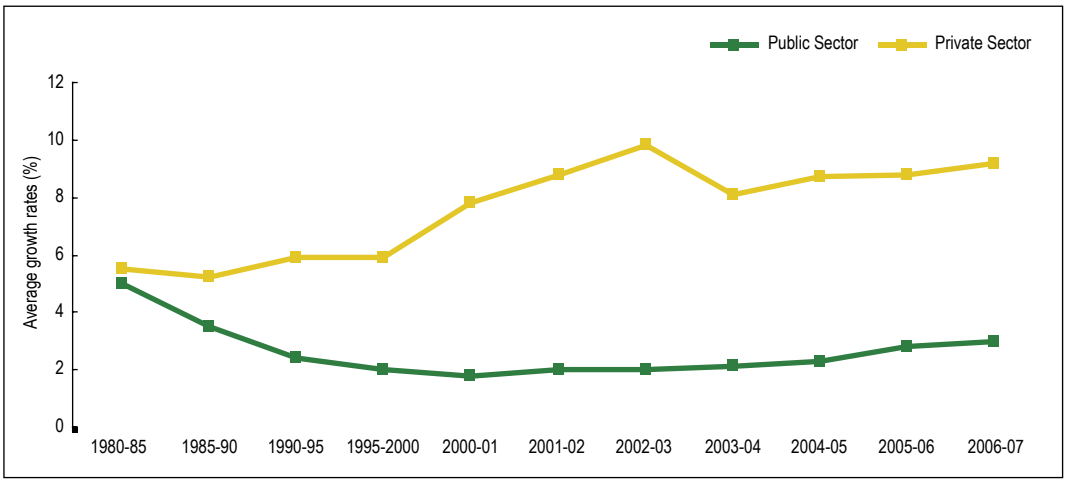
Education: The Indian agricultural education system comprises of 40 State Agricultural Universities (SAUs), four ICAR Institutes (IARI, IVRI, NDRI, CIFE), Allahabad Agricultural Institute, one Central Agricultural University and four Central Universities which have a strong agricultural faculty. There are also a large number of private colleges both affiliated and non-affiliated to SAUs. According to UGC, there are currently 63962 students enrolled in agriculture education in India, accounting for just 0.58 per cent of the total enrolment in higher education. There is a striking regional imbalance in enrolment with Uttar Pradesh accounting for almost 30 per cent of the all-India student enrolment. Further, agricultural studies are not an attractive option anymore

Figure 49: Average GDP growth rates of agriculture and other sectors at 1999-2000 prices



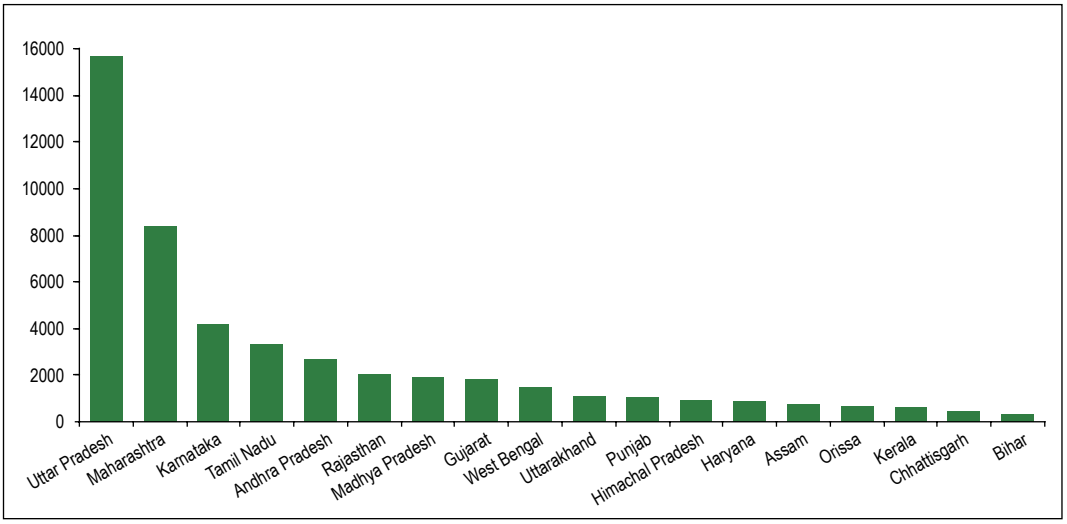
Source: Economic Survey, 2007-08

Figure 50: Investment in agriculture: Gross capital formation in agriculture as a percentage of GDP from agriculture



Source: Eleventh Five Year Plan, Planning Commission

Figure 51: Enrolment in agriculture education (2001)



Source: University Development in India, 1995-96 to 2000-01, UGC

– it is looked upon as an inferior science to be taken up when all else fails.

Extension: The Department of Agriculture and Co-operation (DAC) is the central agency coordinating agricultural extension. In addition, the National Institute of Agricultural Marketing (NIAM) and the National Institute of Agricultural Extension Management (MANAGE) are autonomous bodies established for providing the government further assistance, especially in facilitating the acquisition of managerial and technical skills by personnel involved in the agricultural economy.

Various structures, projects and initiatives have been put in place in order to promote agriculture extension in the country. These include Agricultural Technology Management Agency (ATMA), Krishi Vigyan Kendras (KVKs), Agri-clinic and agri-business centres, Kisan Call Centre Scheme etc. ATMAs have been set up in various districts to decentralise, integrate and coordinate R&D activities, using modern information and communication technology to improve linkages between the various extension agencies. KVKs have been initiated by ICAR to identify the technological gaps, critical needs and requirements of the farmers, and impart skill through various programs. In addition to the demonstration of latest technological development, assessment and refinement at farmers' fields, the KVKs also provide farm information services through literature, exhibitions, field days, farmers tours, crop seminars, kisan melas, radio and television programs, correspondence services, telephone consultancy and helpline services etc. So far over 554 KVKs (as on August 2007) have been established.

Table 19: Global extension practices

Country	Extension Practices
United States of America, Canada, Australia, Denmark	Strong extension services – first public, and now public and/or private. None of these very developed countries has ever considered the discipline of extension as inferior to other agricultural disciplines at the time of resource allocation. Several developed countries have fully or partially privatised their agricultural extension services in a variety of ways.
Costa Rica	The government provides farmers with extension vouchers which can be used for getting extension advice from private specialists.
England	The public extension service has evolved over time into a private consulting practice. The positive result is enhanced efficiency of staff, and the negative effect is the deprivation of small farmers of extension services as the result of their inability or unwillingness to pay.
Holland	About 60 per cent of the extension budget comes from farmers, while the remaining 40 per cent is provided by the government. The benefits include increased efficiency, improved quality, client-orientation, job satisfaction for staff, and expanded marketing opportunities for farmers.
Albania	Private sector entrepreneurial initiatives to create a long-term relationship with farmers have proved to be successful.
Uganda	Privatisation of extension through the creation of a pool of private extension specialists out of its existing public extension service. Registered farmers' associations could call upon this pool through bidding for providing services related to selected enterprises, and pay for the services from the funds given to them by the donors through decentralised government units.
Israel	The government is still responsible for providing extension advice, but encourages privatisation through the standing practice of growers to contribute portion of their income to research and development including extension, public and private partnership in financing and operating units within the extension service, payment for services by commodity production and marketing boards beyond a basic extension package, the provision of more intensive extension activities at the request of needy growers, special agreements with commodity farmers' organisations, extension staff working on their day off in exchange for direct payment from farmers, provision of equipment like mobile phones to extension advisers by growers associations, and direct payment by farmers for participation in training activities.
Indonesia	Some projects have not only encouraged NGOs and the private sector, but also agricultural research institutes, agricultural universities and farmers' associations, to participate in the delivery of extension services. Indonesia has successfully established new institutions called Agricultural Technology Assessment Institutes at provincial level, bringing together farmers, researchers and extension specialists.
Lao People's Democratic Republic, Vietnam and Mali	Experimenting with *tele-centres*, which have already exhibited their benefits in several Western European countries. Virtual linkages are being established for bringing research and extension together, and one example is the VERCON (virtual extension, research and communication network) tool, which FAO has introduced in Egypt and Bhutan. Under an FAO project in the Philippines, the Internet and interactive e-mail facilities have been established at municipality level for supporting decentralised extension staff. *Expert systems* are also being developed to compensate, to some extent, for the too-rare visits of subject-matter specialists to farmers' fields. Over 30 per cent of extension staff in Estonia use the Internet. One can find programs like "virtual gardens" and "virtual farms" on the Internet.

Source: 'Modernising National Agricultural Extension Systems, A Practical Guide for Policy-Makers of Developing Countries', FAO, 2005.

Issues within the research and extension framework

Funding: The current allocation to agricultural R&D, which stands at is 0.7 per cent of agriculture GDP, is grossly inadequate. This funds crunch is the main factor behind the disintegration of public systems of agricultural R&D in several places. Today almost in all SAUs about 80-85 per cent of the budget goes towards salary and other establishment costs. The ICAR share also has dwindled and varied from 33 per cent in the Fifth Plan to almost 9 per cent in the Eighth Plan. In all SAUs, 25 to 30 per cent posts are not filled on account of squeeze in budget and this has seriously impacted quality of instruction. Allocations to this sector must be significantly increased both at the Centre (to at least 1 per cent of GDP) and in states.

Infrastructure and human resources: The financial crunch coupled with bureaucratic rigidities has caused colossal gaps both in basic infrastructure and human resources. Lack of water, power, basic equipment like cell phones

and vans, vacancies in the scientific posts in agricultural universities and understaffing of extension providing bodies by underpaid workers are just some of the problems plaguing public research and extension units.

Service providers outside the public sector: The Farmers Commission Report testified that in the 40 per cent of farmer households at an all-India level who *did* access modern technology, "other progressive farmers" emerged as the most popular source (16.7 per cent); followed by "input dealers" (13.1 per cent) and "radio" (13 per cent). Private R&D institutes and demand-driven extension service providers have entered the agricultural economy in a big way. As R&D providers by proxy, they may well be motivated by vested interests and thus pose a real threat to the farmer who has no other option. Alternatively, service providers in the private sector may fulfill an important function efficiently, in the absence of a more reliable mechanism.

Research-Extension linkages: There is often disconnect between the research done by agricultural scientists and the on-farm practices of farmers. (See Table 20) The structure of the present public extension system is linear and compartmentalised, thus propagating a top-down approach that does not encourage interaction and co-operation amongst the several actors. Most importantly, it does not incorporate a mechanism for feedback. Therefore, extension workers continue to disseminate technology that may not only be irrelevant, but also harmful for the farming community.

Information and Communication Technology (ICT): The availability and convergence of ICTs – computers, digital networks, telecommunication etc. – has been significant in the dissemination of knowledge and information to the rural population in recent years. The village knowledge centres established by the MS Swaminathan Research Foundation (MSSRF) in Pondicherry, and the village internet kiosks established by ITC under the "e-chaupal" program are examples of highly successful ICT deployment for research and extension and market access in agriculture.

Agricultural universities: In order to meet the systemic challenges in the R&D arena, the syllabus and curriculum in agricultural universities need to be more flexible and interdisciplinary. Incorporation of social sciences and management techniques, primacy accorded to fieldwork and regular training and refresher courses for extension workers must be added to the curriculum in order to address the disconnect between the lab and the land. Incentives and schemes must be established to attract the best minds to stimulate R&D activities in universities.

Table 20: State-wise performance and potential yield of selected crops

State	Improved practice (I)	Farmer practice (F)	Actual yield 2003-04 (A)	Gap (%)	
				I and F	I and A
Wheat (Yield: Kg/ha - 2002-03 to 2004-05)					
Bihar	3651	2905	1783	25.7	104.8
Madhya Pradesh	3297	2472	1789	33.4	84.3
Uttar Pradesh	4206	3324	2794	26.5	50.5
Rice (irrigated) (Yield: Kg/ha - 2003-04 to 2004-05)					
Uttar Pradesh	7050	5200	2187	35.6	222.4
Bihar	4883	4158	1516	17.4	222.1
Chhattisgarh	3919	3137	1455	24.9	169.4
Sugarcane					
Maharashtra	127440	99520	51297	28.1	148.4
Karnataka	147390	128000	66667	15.1	121.2
Bihar	74420	49440	40990	50.5	81.6

Source: Economic Survey 2007-08

Note: *The data and statistics provided in the baseline section, unless stated otherwise, have been taken from Ministry of Human Resource Development (MHRD), Planning Commission, University Grants Commission (UGC) and District Information System for Education (DISE).*