

Agriculture Extension System in India

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ABSTRACT

Agriculture extension has traditionally been referred to as the dissemination of knowledge and technology to farmers. It is the incorporation of new information into agricultural operations as a result of scientific study and farmer learning. Extension, according to the World Bank, is the “process of assisting farmers to become aware of and use technological improvements from every source to improve their production efficiency, income, and wellbeing” (Purcell and Anderson, 1997). “Agricultural Extension” is one of the three pillars of Agricultural Knowledge Information System (AKIS) that encompasses a broader range of interaction and teaching programs conducted by experts from various disciplines. It bridges the gap between research laboratories and the fields of farmers.

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Agricultural research, education and extension are most important for fostering productivity of farm and raising farmer’s income.

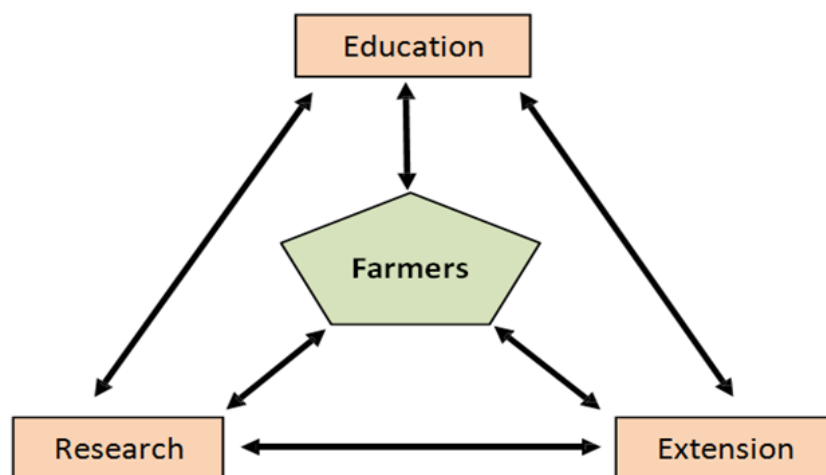


Fig 1. Agricultural extension as a part of AKIS

Extension Programs at the time of Pre-Independence

A core of the Agriculture department began the extension effort throughout India in the mid-19th century (1871). Until 1882, all states of India had Government Agricultural Departments, but no extension system was available to provide farmers with agricultural information. Food production was not influenced by agriculture departments, because they primarily concerned themselves with the collection of statistics and mainly revenues.

Then the establishment of Famine Commission in 1901 was the first concern for public welfare by British Government. This commission suggested, for the first time the recruitment of professionals who were willing to use scientific methods in agriculture. Afterwards all the “rural development” departments were transferred to then Provinces covered by an Indian Government Act in 1919. In 1928, the groundbreaking recommendation of Royal Commission on Agriculture highlighted the importance of disseminating new research findings to farmers. This advocated the holding of short agricultural training courses, field demonstrations and the use of visual aids for agricultural development. Various rural development programmes were conducted and among those Sriniketan by Rabindranath Tagore and Sevagram by Mahatma Gandhi were the key rural development and social reform programmes. But, the bulk of these non-government activities limited to small areas and individual projects were not able to further spread effectively.

Post-Independence Extension Programs

The first post-independence extension programme was Etawah Pilot Project (1948) by Albert Mayer. Similar to this “Community Development Program” (1952) & “National Extension Service” (1953) were first introduced to educate farmers on better farming practices. Other significant area-focused projects included “High Yielding Varieties Programme” (HYVP, 1966), “Intensive Agricultural Area Program” (IAAP, 1964), & Intensive “Agricultural District Programme” (IADP, 1960). To supplement the aforementioned activities, “Farmers Training Centers” was established in 1967 for inform farmers about high return cultivars & to provide them with training in more effective agricultural techniques. The combined benefits of these programmes increased Indian agriculture’s output in the late 1970s, aiding in the Green Revolution.

However, a number of client-based initiatives were introduced as a result of the growing divide between wealthy and poor resource farmers. The most major programmes were the Lab to Land Program supported by ICAR, Small Farmers Development Agency (SFDA), District Rural Development Agency (DRDA), and Marginalized Farmers and Agricultural Laborers Programme (MFAL, 1969). (LLP, 1979). In 1974, the Training & Visit (T&V) system—a unified, standardised command structure with knowledgeable field officials—was put into place. By help of “World Bank”, T&V system was further put into place statewide in 1977 and quickly took over as the primary technique of reforming the extension services.

The T&V system's salient characteristics are: professional conduct ii) a single chain of command, iii) focus on one thing, iv) time constraints, v) field & farmer orientation, vii) frequent training for extension agents and farmers The system had demonstrated excellent achievements, but challenges with financing sustainability, strict staffing requirements, and personnel quality emerged as the system's primary worries (Feder et al., 1987; Anderson and Feder, 2004). The T&V system faltered in the early 1990s due to a shortage of World Bank funding, a lack of farmer accountability, low levels of farmer involvement, and little attention paid to the location-specific requirements of disadvantaged groups of farmers. With the help of the World Bank, the Indian government established an Agriculture Technology Management Agency (ATMA) in 1998 as a replacement for the Training & Visiting (T&V) programme. The National Mission on Food Security was introduced by "Department of Agriculture and Farmers' Welfare" (DACFW-2014-15).

Agriculture Extension & Technology (NMAET) will restructure and strengthen current agriculture extension programmes to make it accountable and driven by farmers.

In India, agricultural extension is more concentrated on crop production than on related industries that considerably increase a farmer's household income, such dairy & fisheries. Addition to government sector extension, currently provides a one service fit to every type of farmer and their products. Due to the lack of current developments in agricultural technology and development, extension workers must constantly increase their skills while taking into account the diversity of farmers, the crops they grow, agroclimatic conditions, soil types, resource endowments, etc (Nandi and Nedumaran, 2019). Although the extension models run by NGOs are extremely successful & responsive to local interests, they are unable to make a significant influence on a large number of people. Best practises among individual participants are hence scarce, and implementations are generally applicable. Most extension players lack quality standards, accountability to farmers, and leave farmers on their own in the event of faulty advise. This is especially true of the seed market where legal concerns frequently arise. It has been established that inappropriate knowledge has a negative effect, especially in the commercial sector. For instance, there are fake pesticides and fertiliser markets spread over the nation (Nandi and Nedumaran, 2019).

Investment status in agriculture extension

Development of the agricultural sector is primarily a state responsibility in India. However, the Union Government develops the agricultural growth-oriented policies, and both the Central and the State allot the public monies, with around 55,4% of the total allocation going to the Central and 44,6% to the States. Regionally tailored programmes are developed by state governments, whereas national scale programmes are primarily executed by state development agencies. The whole cost of research and extension in agriculture and related activities increased

from Rs. 31.073 million in 2000-01 to Rs. 61.552 million in 2014-2015, with a compound annual growth rate of 5% during those two time periods (Gulati et al., 2018). A overall spending of Rs. 17,956 million was allocated for agriculture extension & education in 2014-15.

It was more than the Rs. 6,407 million in 2000-01 and had an allocation of 82% from the state government and 18% from the federal government. In 1971, this percentage was 0.32 percent, and it increased to 0.45 percent after 20 years, 0.5% until 2007, and then stayed steady at 0.5% until it finally dipped to 0.54 percent in 2014-15. In 2014-15, it was 0.16 percent, which added out to 0.7% of GDPA for agricultural extension, which is less than the World Bank's recommended level of 2% of GDPA (Nandi and Nedumaran, 2019).

Manpower status in “public extension system”

In the nation, the public sector is a significant provider of extension services. However, the availability of extension services to the general population is restricted, and under-staffed departments are tasked with non-extension tasks, including distribution of subsidies and inputs, leaving little time for employees to perform the required extension tasks. (Reddy, 2018). Only 6.8% of farmers in the nation receive extension services, possibly as a result of the lack of extension officers at all levels of government (Nandi and Nedumaran, 2019). The State Department of Agriculture has a significant number of open positions, with just 91,288 of the 143,863 positions filled, resulting in a low extension worker-to-farmer ratio (1:1162) as opposed to the recommended national level ratio of 1:750. (Gulati et al., 2018). Only six states have extension personnel to village level, while Eleven states have extension personnel up to panchayat level. Most states have extension personnel down to the block level.

Central level Bodies

Department of “Agriculture Co-operation” & “Farmers Welfare” (DAC & FW)

India's central government body, the Union Ministry of Agriculture, is responsible for creating and carrying out the country's agricultural laws and regulations. “Department of Agriculture & Farmers Welfare” (DAC & FW), “Department of Animal Husbandry”, “Dairy & Fisheries” & “Department of Agricultural Research & Education” are all included in this. With the help of three Ministers of State, these Departments lead the Agriculture and Farmers' Welfare Ministry, which is led by the Minister of Agriculture and Farmers' Welfare. One “principal adviser”, 5 “additional secretaries”, one “financial adviser”, one “agriculture commissioner”, twelve “joint secretaries”, including “National Horticulture Mission” & “National Food Security Mission”, “Horticulture Commissioner” “Horticulture Advisor” “Economic Advisor” & two “Deputy Director Generals”, make up this department's administrative director.

“Indian Council of Agricultural Research” (ICAR)

ICAR, an independent body which work under “Department of Agricultural Research & Education” (DARE), “Ministry of Agriculture and Farmers Welfare”, “Government of India”,

currently in charge of the Public Research Systems. It is the nation's premier organisation for coordinating, directing, and managing all aspects of agriculture, horticulture, fisheries, and animal sciences. It has 65 central research institutes, 15 national research centers (NRCs), 6 nationwide bureaus, 13 , 60 "All India Co-ordinated Research Projects" (AICRPs), 19 "network projects", & 10 additional projects. It also has five national discipline institutions. Additionally, the nation is home to 101 ICAR institutes and 71 agricultural universities. AICRPs involve over 1300 centers, of which 900 are located at agricultural colleges and 200 in ICAR Institutes. 200 sub-stations as well as Zonal Research Stations are part of the ICAR. "National Academy of Agricultural Research Management" (NAARM), is another organisation within ICAR, manages agricultural research and training. The ICAR has established 8 training centers (TTCs) and 706 Krishi Vigyan Kendras at the district level as cutting-edge institutional models to assess, enhance, and translate current agricultural technology. More than 100 corporate and nonprofit organisations are also collaborating, in addition to the Council of Scientific and Industrial Research (CSIR), the National Remote Sensing Agency, the Bhabha Atomic Research Center (BARC), and other government ministries and departments.

Private Sector

The majority of the private sector's input dealers, such as those who sell seeds, fertiliser, pesticides, and agricultural equipment, provide extension services for agriculture. About 282,000 input merchants provide extension services; one such company is Hyderabad-based Nuziveedu Seeds, which does so through its Subeej Krishi Vignan programme. Companies that produce fertiliser, like IFFCO (Indian Farmers Fertilizer Co-operative Limited) and KRIBHCO (Krishak Bharati Cooperative), engage in extension operations by hosting farmer gatherings, crop seminars, setting up facilities for soil testing, adopting communities, etc. Tata Chemicals started the Tata Kisan Kendra with the intention of empowering and assisting farmers to improve their agronomic practises and increase their yields. Syngenta offers training courses for farmers on pesticide application techniques, crop protection, etc. Nestle offers farmers in India who operate either individually or in partnership with other groups from all sectors extension services for dairy & cattle health. A number of other businesses, including Pepsi, Hariyali Bazaar, Hindustan Lever Ltd., Rallis and ICICI, Adani Agrifresh, Field Fresh Foods Private Ltd., etc., are involved in extension efforts for farmers.

Non-Government Organizations (NGOs)

NGOs offer demand-driven extension support to Indian smallholder farmers even when governments are unable to provide assistance to everyone who requests it. They are quite active in society, vary greatly in size, and are primarily funded through donors or international sponsors. The biggest non-governmental organisations of India which have been active for many years in numerous states like: PRADHAN, BAIF & BASIX. PRADHAN is foremost proponent of

“self-help” in eradicating poverty by enhancing the capacities of the underprivileged and facilitating access to sources of stable income. Basix employs 80% of its workforce to deliver services in small villages and it have about 3.5 million microfinance clients, approx 90% from which are poor rurals & 10% are located in urban slum. BAIF is Development Research Foundation, which serves 2.5 million farmers, many of them are from difficult areas, through 75 centers and more than 3000 personnel (<http://sapplpp.org/links/baif>), is another excellent NGO in the development of agricultural and livestock. Other non-governmental organisations that report on extension activities include the “Environmental Energy Group” (EEG), “Society for Advancement of Village Economy” (SAVE) “Self Employed Women’s Association” (SEWA), “Action for Agricultural Renewal” (AFARM), “Arpan Seva Sansthan” etc

Information Sources used by Farmers

Communication exposure helps farmers to gain general awareness, cosmopolitanism and technical knowledge about farming. Sawhney (1967) classified the sources of information searched by the farmers in the following broad categories-

A. Mass Media Sources: Includes electronic media like radio, television (TV), mobile and internet; print media like newspaper, farm publications and traditional media like fair, exhibitions, etc.

B. Personal Cosmopolite Sources: Includes Agricultural Development Officer (ADO), Agricultural Extension Officer (AEO), Village level Worker (VLW)/ Kisan Sahayaka (KS), representatives of State Agricultural University (SAU) or Agricultural Colleges, representatives of Panchayat Raj Institutions, representatives of various Co-operative Societies, representatives of Banks, Agricultural Input Dealers, etc.

C. Personal Localite: Family members, neighbours, friends, shopkeeper and progressive farmers or neighbouring farmers.

Operationalization of the Concept of Information Needs and Sources

As the agriculture scenario is becoming more complex, it is more and more important for farmers to have access to reliable and relevant information. To support their agricultural businesses, farmers require a wide range of information in the agricultural value chain. Several researchers had identified various information requirement of farmers on best sowing time, method of planting, storage and processing of seed, agro chemicals usage (Babu *et al.*, 2011), quality seed and their availability (Bachhav, 2012; NSSO, 2005), fertilizer application, plant protection (Adhiguru *et al.*, 2009), diseases or pest early warning system and management, weather forecasting, latest packages of practices, market information, information on subsidies (Shaik *et al.*, 2004), irrigation, harvest, post harvesting technology (Meitei and Devi, 2009), most appropriate technological option, optimal use of inputs, reputable input suppliers, time to buy inputs and sell produce, options to raise off-farm income, access to credit and loans, sustainable management of

natural resources and climate change policy (Van den Ban, 1998), etc. Accordingly, Menong *et al.* (2013) studied various information needs of farmers with categorizing in three aspects that are agricultural inputs, production and market and supply chain.

However, the information needs would differ among different categories of farmers and could be targeted towards specific groups; for example, on the basis of land holdings or agro-climatic area (Rivera 1996). Besides the need for different types of information and the use of different sources, farmers will also differ in search behaviours because obviously farmers are not a homogeneous group. According to the NSSO survey from 2003, medium & large-scale farmers have access to more information from more sources, while small & marginal farmers have less access to both (Adhiguru *et al.*, 2009). Singh (2011) asserts that social capital is crucial for farmers' information use and search. By joining farmers' organisations and organisations that might increase their access to the latest information, progressive farmers may be more inclined to participate in the accumulating of social resources. Their amount of social wealth can be used to measure a farmer's involvement in extension programmes, long-standing relationships with public authorities, and interactions with other producers and private input suppliers. According to Bernard *et al.* (2011)'s discussion of aspiration, the ambition capability and aspiration gaps may have an impact on a person's behaviour (Ray, 2006; Appadurai, 2002). Therefore, the economic and psychological traits of farmers that determine their life objectives can affect the way they search.

In rural Manipur, Meitei and Devi (2009) noted that farmers' top needs were information on seed varieties, insecticides, and fertilisers. According to Mittal *et al.* (2010), the farmers' top demands are information on market prices, weather-related problems and updates, diseases and plant protection, as well as information on seeds. In their 2013 survey of 1,200 farmers in the five major states of India's Indo-Gangetic Plains (IGP), Bihar, Haryana, Punjab, Uttar Pradesh, and West Bengal, Mittal and Mehar found that the three most important information needs were input availability, pre-sowing, and input costs. Studies like these discuss the diversity of information needs & sources utilised by farmers; as a result, a thorough study of the variables impacting information needs & sources used and preferred is required. Personal characteristics like age (Sarker, 1995; Shaik *et al.*, 2004), education (Menong *et al.*, 2013; Singh *et al.*, 2010; Katungi, 2006), and farming experience are among the influencing factors mentioned by some researchers. Socio-economic characteristics like the type of farm enterprise, farm ownership, marketing capability of farming, debt level (Babu *et al.*, 2011), land holding size (Mittal and Mehar, 2013; Singh *e* (Menong *et al.*, 2013).

Changing Information Needs from Agricultural Extension System

Farmers' information needs change from time to time, with changing agricultural technologies, climate change and agricultural policy and the emergence of farming innovations (Klair *et al.*, 1998). Farmers must make a lot of difficult decisions as agriculture changes, for choosing

profitable situation-based technological options with available inputs and knowledge, making optimal use of new inputs, changing farming system (when and how), types of good demanding products in the market, quality specifications to get "good value" of produce & how to achieve it, buying inputs & selling products (How, when and where), making collective decision on resource use and marketing and knowing whether there are any viable off-farm income creation opportunities available to him and how much he may rely on them? Additionally, they require easy access to the most current and credible knowledge and information. "Over the past 20 years, a large number of new institutions, both public and commercial, have formed to support farmers in all of aforementioned areas. But "their concentration of labour and spending in particular crops and locations are harming their effective outreach to the public" (Sulaiman and Sadamate, 2000).

Conclusion

Thus, we have seen that Agriculture Extension System is absolutely essential for the farmers for their financial progress. Through a proper agriculture extension system, they can increase their yield and by which they get good quality crop which can increase their income. Government sector is engaged in its efforts for agriculture extension system, but for this, more efforts are needed so that even marginal farmers can take advantage of it.

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