International Journal of Commerce and Economics
www.commercejournal.in
Online ISSN: 2664-7540, Print ISSN: 2664-7532
Received: 01-06-2021, Accepted: 17-06-2021, Published: 30-06-2021
Volume 3, Issue 2, 2021, Page No. 41-45

From rhetoric to reality: A framework for designing agriculture extension service for India

P Venkata Bhargav
School of Economics, University of Hyderabad, Telangana, India

Abstract
Poverty and Food security are the stumbling blocks that every country needs to cross for becoming a developed country. India in its travel to become a super power it needs to combat these two chronic problems, now question arises how to overcome these problems where majority of people dependent on agriculture. In this paper, we are discussing agricultural extension system which has potential to combat these two stumbling blocks. Although it has capabilities to trounce these problems, we are not able to do so. It is because of the generic challenges in practical implementation of the programme. Here, we are discussing those challenges and viable solutions to them. Furthermore, framework is the important element in designing any programme, extension system also needs certain frame conditions for transparency, accountability, effectiveness, sustainability of the programme.

Keywords: extension service, accountability, effectiveness, decentralization

Introduction

Overview

Dissemination of information about new agriculture inputs like recent technologies, new seed varieties etc, and passing on the efficient cultivation methods are the prime works of any government across the world. So that farmers will be able to make use of the latest agricultural developments in their farms. This dissemination of information is delivered by an institution called Agriculture Extension system. This institution generally fills the gap between the agricultural research sector and the requirements of farmers. Agricultural extension agents demonstrate the use of technology in the fields.

In India, The main goals of agriculture extension system are broadly two.

Goal 1: How to alleviate poverty in rural areas?

68% of the population resides in rural areas, out of which 70% are directly dependent on agricultural activities. Of the 407 million living below the poverty line, 325 million people live in country side which accounts for 80%. To overcome these poverty levels in rural areas, we should emphasise on recuperating agricultural farm income.

Goal 2: How to cope up with problem of Food Security?

Food security is the foremost problem for all developing countries and India is one among them. Immediately after independence, India faced acute food shortage due to low productivity of the fields. The population has grown from 361 million in 1951 to 1210 million in 2011, with an average decadal growth rate of 21% [8]. To keep pace with the growing population, we should focus on improving productivity of the land holding. The solution for both these problems is efficient agriculture extension system.

In the 1960's, Green Revolution came to India with its features of High yielding varieties seeds, fertilizers, pesticides, irrigation and credit facilities. In the implementation of this programme, public extension system played a crucial role in technology transfers, farming practices, and knowledge transfers about the crop. Extension system became an integral part of India's transition towards food sufficiency to feed the growing population of the country. Another important consequence of the Green Revolution is the improvement in the farm income of the most of the farmers across the country.

1. Defining Agriculture Extension

What is agriculture extension?

Agriculture extension is defined in various capacities by various people: Birner, Davis, et al (2006) [2] defined it as "the entire set of institutions that support and facilitate people engaged in agricultural production to solve problems and obtain information, skills, and technologies to improve their livelihoods and well-being". An advisory service also implies a service orientation and a move away from top-down models of technology transfer.

Generic Challenges in Extension services

Why agricultural extension is not effective?

Generic problems are intrinsic in extension functions because of the nature of services provided by them is public good, problems like accountability and transparency will arises here. And extension services are based on a collective action of players like farmers, agents and government. Various people[i] mentioned about eight core generic challenges which are discuss here.

Scale and Complexity

In most of the developing countries, there exists huge number of farms, which are relatively small plots, cultivated by small and marginal farmers. The information given to farmers also varies on their soil type, micro climatic conditions, farmer's capacities etc. Inspecting these farms with many variations is a major constraint in delivering extension services for field staff. Most of the farmers in developing countries have very low levels of education. Hence, it is a problem in transferring information regarding technological know-how and knowledge transfers.

From the extension policy side, there are problems like centralization of extension with top-down managerial style.

Decision makers are generally unaware of operational complexities due to lack of participation in the field.

Dependence on the wider policies

Extension works in developing countries depending on the policies formulated by different institutions. These policies include credit, input supplies, technology stocks, price incentives, and weather forecasting. "Co-ordination between the agencies that influence these complementary factors and extension management is expensive and difficult, and extension agencies generally have little leverage" (Anderson and Feder 2004).

However, the effectiveness of agriculture extension is significantly dependent on policies of other institutions and agencies. But extension system has no authority on those players over which extension organization has no authority or limited influence.

Difficulty in attributing impact

The difficulty of addressing the liaison between extension services and its impact is very well known challenge in extension assessment. This challenge "leads to several other inherent problems, including less political support, low budget provision, and weak accountability" (Feder, Willett, and Zijp, 1999) [3]. This problem arises because of no common indicators to assess the impact of the extension system. Nevertheless, the achievement of the extension system can be measured in different stages. In the initial stages, it can be measured by the adaptations of technology and cultivation techniques passed by extension workers. In long run, the impact of extension work is assessed by the productivity, profitability, efficiency, input demand, and output supply. It can also be measured by an econometric model, where the "production function, cost function, or total factor productivity analysis is used to estimate the change in productivity resulting from an investment in extension" (Anderson and Feder 2004).

Weak Accountability

Lack of accountability of extension field staff is a major constraint. Agents were not held responsible for the quality of extension work at grass root level and extension officials are often cutting down the size of field staff on the ground.

Howell (1986) recognized three features of accountability in extension system:

1. *"*Extension performance in terms of its effectiveness, impact and appropriate information;
2. Accountability of dispersed, relatively unsupervised field staff to supervisors;
3. Grass root level extension staff accountability to farmers".

The second and third problems are very much applicable to the agriculture extension systems in developing countries like India, where very large numbers of field staff are not supervised by the supervising officials in the higher level. The attitude of the extension field staff is also one of the constraints for clients i.e. farmers, to approach them for suggestions, which leads to gaps between both the groups.

Public functions other than extension work

In developing countries, Extension workers are extensively distributed grass root level agents of government in rural areas. Therefore, there exists a temptation to load them with more functions by other departments. They are generally used in activities like census, statistics collection, conducting surveys etc.

There are both 'push' and 'pull' factors absorbed in this intrusion on extension system. Push factor is the attraction of the officials from other departments to use widely distributed extension agents for their works in countryside. On the other hand, pull factor is the excitement of the extension staff to work with other powerful agencies to gain influence over the farmers. These non knowledge works are reducing the efficiency of the extension workers in transferring knowledge and information.

Weak commitment and strong political intervention

In most of the developing countries, the majority of the population is dependent on agricultural and allied activities but still budgetary allocations towards agriculture are very low compared to other allocations. In allocated budgets, preferences are given to infrastructural developments like construction of irrigation canals, dams, storage facilities etc because of the political benefits.

Political intervention in the appointments of the extension workers is also a major problem in extension services. It is so because extension workers are the grass root level government agents in the rural areas and to gain control over the farmers in sparely populated rural areas, the support of the extension workers is prominent.

Fiscal Unsustainability

Fiscal scantiness and the "unsustainability of extension operations is common in the extension literature" (J. Hanson and R. Just 2001) [10]. The core problem for extension system for its long run sustainability is the inbuilt complicatedness of cost recovery. Most of the information disseminated by extension system is a 'non rival and non excludable good' in its nature. Because of this characteristic of extension, costs recovery became a major problem. "Thus, there is a dependence on direct public funding" (Feder, Willett, and Zijp, 1999) [3] and weak political commitment towards extension in budgetary allocations made the condition worse. In public extension system, fixed costs for salaries of the extension agents are high, which means that the major portion of budgetary allocations are going to salaries and operating costs like traveling expenditure and demonstration machinery costs are treated as left over's in the budgets. This makes them vulnerable to a budget shortage. This shortage has obvious effect on performance of extension system, if extension staff cannot go in to the field, there won't be any transfer about technology and knowledge.

Lack of Interaction with knowledge institutions

The biggest constraint of the public extension services across the world. It was "the conclusion of World Bank's 1994 ex-post evaluation of large extension projects" (Feder, Willett, and Zijp, 1999) [3]. It was found that research and extension links were weak in developing countries. Generally, in these countries, extension advices are not generated within the extension system but in a separate system which include agriculture research institutes, universities, and research and development wings of agricultural input companies. But researchers in these institutes and universities may be more concerned in publishing scientific papers than providing new agricultural

technologies to farmers and working in the field. These inadequate research-extension links are leading to detrimental outcomes.

New technology is necessary to transform agriculture in rainfed, and resource poor environments. But the gap between extension workers and knowledge generations cause a major hindrance in passing on the technology and knowledge transfers. So, extension agencies should focus on the interactions between their extension agents and knowledge generations for regular update of technologies used in cultivation.

Knowledge transfers should not be restricted to technology transfer and farming practices in the field: they should include updates about climatic condition, details regarding credit facilitates for agriculture, marketing opportunities of their output etc.

Hence, coordinating meteorology department, banking officials, and marketing staff etc should be given prime importance in the extension system for better results.

2. Solutions to challenges

How to improve extension the existing system?

Feder, Willett, and Zijp (1999) [3] gave some innovate modification in extension system for better outcomes: decentralization, improving extension management, single commodity focus, public–private model, and fee for service provision. Along with their solutions we added one more solution which has contemporary importance: Information and Communications Technology (ICT).

Decentralization

Decentralization means administrative at local governments. It gives "political-fiscal devolution of program, funding decisions and staff accountability to local units" (Feder, Willett, and Zijp, 1999) [3]. And the impact of the decentralization depends on the degree of autonomy enjoyed by the local units of governments'.

For effective decentralization of agriculture extension, certain steps should be followed such as capacity building of local farmers and involving them in the extension programme as contact farmers or lead farmers. And lodging permanent extension agents at villages will make them more accessible and making them directly responsible to clients will improve accountability. With the help of decentralization, we can overcome problems like scale and complexities since the cropping patterning will remain the same and the smaller area is easier to access and analyse similar climatic conditions and farmer capacities. The efforts required for coordinating different agencies will also get reduced due to a small geographical area.

Improving extension management

Various models of extension system are implemented across the world. The Training and Visit (T&V) system of extension is considered as one of the improved management which was promoted by the World Bank between 1975 and 1995 in majority of developing countries. Training and visit designers stressed on a single line of command with several levels of field and supervisory staff, professionalism with in-house subject matter specialists to provide training to staff and tackle technical issues reported by field staff, exclusive dedication to technical information dissemination; time-bound work with a strict and predetermined schedule of village visits over a two-week cycle, with contacts with selected "contact farmers"; regular and continuous training with mandatory biweekly training emphasizing the key set of messages for the forthcoming two-week cycle; and maintaining close links with research through a seasonal workshop with research personnel (Anderson and Feder, 2004).

With this system problems like lack of interaction can be overcome with knowledge generation with the help of seasonal workshops and tight supervision of extension agents. It would also improve accountability within the service. Difficulty in attributing impact in initial stages can be overcome by strict and predetermined schedule of village visits. There will not be any public duties other than knowledge and information transfers due to their fixed schedule of training and field visits.

Single commodity focus

With single commodity focus, we can overcome several generic challenges: scale and complexities challenge by a narrow focus on a selected commodity which simplifies extension task. Through vertical integration of complementary services we can overcome dependence on wider policies and difficulty in attributing the impact of extension system**.** We can improve accountability by involving private (agro industry like sugar, tobacco) and social sector (farmer organizations). The small-and-focused approach is relatively cost-effective, and can be fiscally self sustainable by generating revenue through levies on the particular product sales.

Public – Private model

Public and private partnership models are very popular in various sectors of economy in most of the developing countries, but extension services are still a public sector activity. Here, private sector has the incentive to provide private and public good information to farmers and members of private associations for whom extension service delivery is profitable (Feder, Willett, and Zijp, 1999) [3]. Fully privatized extension is not economically viable in developing countries with huge numbers of small and marginal farmers. In such a case, public sector finance remains essential, mixed with various cost-recoveries, co-financing, and other transitional institutional arrangements.

Input suppliers have strong incentives to provide advice on better techniques like precision farming in the cultivation of crops which will improve their sales in the long run. The research and development wing of Jain irrigation system helped farmers of Jalgaon district (of Maharashtra state, India) in implementing precision farming in their region and the results of this effort are outstanding.

By including the private sector in the extension will help in overcoming the problem of weak accountability and they can be fiscally self sustainable in the long run by practicing various cost recovery methods and fee for service models. Privatization may lead to conflict of interests among the interest groups. In that case, by public regulation and monitoring backed by public information can be implemented for checking on the quality of the information provided by private firms (Rivera and Zijp 2002) [6].

Fee for service provision

Fee for service is an approach adopted by some public extension services primarily as a cost-recovery strategy but it has other benefits: extension services will become more

accountable to the clients i.e. farmers and the problem of free riders can be avoided by implementing this provision in extension system.

Fiscal unsustainability is a major constraint in extension system; inadequate public funding to operate extension services is a common phenomenon in World Bank-assisted Training and visit extension projects, with 76 percent of projects having an uncertain or unlikely sustainability rating (Purcell and Anderson, 1997) and most of the project are stopped after World Bank stopped funding. Hence, for fiscal sustainability, the extension system should go for fee for service.

In developing countries, most of the farmers are small and marginal farmers and their cultivation is more for their subsistence than commercial purposes. In this case, these farmers can be given coupons for extension services for government or extension fee can be remitted back into their bank accounts etc. Fee for service provision will bring a more professional, client-oriented relationship between extension agent and farmer, thus improving both accountability and efficiency.

Information and communications technology (ICT)

Information and communications technology is a comparatively new concept in the field of agricultural extension. But ICT has been given a high priority, particularly as a tool for improving the quality, to accelerate the transfer and exchange of information to farmers and to broaden the marketing aspects of farm enterprises (Glendenning, Babu, and Okyere, 2010) [4].

Mobile phones are widely used in rural areas with subscriber base of 300.63 million users in May 2010 in India [9]. Extension system can use this huge base to send SMS alerts or voice messages in vernacular languages regarding weather, input prices, fertilizer quantity per acre, output prices etc. Help lines can be a suitable method for clearing doubt for the farmers, in these help lines, calls can be directed to the specialized cells on single crop like paddy, cotton, sugarcane, pulses, etc for more accurate information. Extension agents can reduce the dependence on multiple agencies by using different softwares, where one will get weather reports, details of input supplies, market prices in nearby market yards by using Kiosk at village level.

3. Framework

`What is the best framework for extension services?

The framework for extension system should change from "Best or Ideal practice" model to "Best fit or suitable" model without operational gaps and leakages. While framing conditions for extension, we need to analysis the operational areas, which includes policy environment and agricultural development strategy of government, departmental capacity in implementation, departmental structure, knowledge limitations of agents, fiscal limitation from departmental side and size of the fields, farmer's education level, technology adoption limitations, economic conditions, and market access to farmers from farmers side.

The characteristics of the extension system should be framed emphasising certain conditions like public- private partnership in financing and organisation, levels of decentralisation, motivation and management approach, size of staff and their capacities, participatory methods, technology transfers. Now, Best fit model will come into view by the above analysis.

In the best fit model, three elements are very crucial. They are performance, clients, and impact. *Performance* is quality of extension services provided, for maintaining quality in the services, they should have demand driven content, targets, timelines, feedbacks, relevance, effectiveness and efficiency. *Clients* are farmers, here farmer's capacity should improve, they should adopt the innovations, and changing practices in production, management and so on. *Impact* involves yields, productivity, spread of innovations, distributional effects, empowerment and gender- specific impact (Birner, Davis, and et al. 2006) [2].

Table 1: Three elements of best fit model

Performance	Clients	Impact
•Demand driven content • Targets • Timelines • Feedbacks • Relevance • Effectiveness • Efficiency	•Capacity building •Adoption of innovations •Changes in practices (production, management and so on)	•Yields •Productivity •Spread of innovations • Distributional effects • Empowerment • Gender- specific impact

Conclusion

If agriculture serves as the skeleton of the economy, then agriculture extension system is identified as the backbone which can prove to be an important catalyst in the growth and development of agriculture, if an efficient model is implemented. This paper attempts to move towards development of efficient model of agriculture extension by analysing various in India and they are analysed with the help of the generic challenge indentified from the agriculture extension system of developing world reviewed in literature. To trounce back these generic challenges, solutions like Decentralisation, Improving extension management, Public – Private model, Single commodity focus, Information and communications technology (ICT) are recommended in extension system.

Framework is identified as a key component in designing an extension model due to prevailing operational problems and leakages in the field. It is also important to moving forward from ideal model to best fit model which is efficient in nature. While framing conditions for the best fit model, analysis of various dimensions of agriculture department and farmers were considered. Performance, Clients and

Impact, are observed to be three crucial elements in the best fit model. Accountability, transparency and financial self sustainability (in long run) are identified as key components for the efficient working of the model.

References

1. Anderson JR, Feder G. “Rural extension services”. Policy research working paper 2976, Agriculture and Rural Development Department and Development Research Group, The World Bank, 2003.
2. Birner R, Davis K, et al. From "best practice" to "best fit": A framework for analyzing pluralistic agricultural advisory services worldwide. DSGD Discussion Paper 37. Washington D.C.: International Food Policy Research Institute, 2006.
3. Feder, Willett, Zijp. “Agricultural Extension - Generic Challenges and Some Ingredients for Solutions”, Policy research working papers: May 1999, The World Bank, 1999.
4. Glendenning J Claire, Babu C Suresh, Asenso-Okyere Kwadwo. “Review of aricultural extension services in India, are farmers information needs being met?”. Discussion Paper series, International Food Policy Research Institute, 2010.
5. Chikezie NP, Ajaero JO, Akande SN, Chikaire JU. Displaced farmers perception of resource- use conflicts as an obstacle to household food security and food safety in Abia State, Nigeria. Int. J Agric. Extension Social Dev 2019;2(2):20-23. DOI: 10.33545/26180723.2019.v2.i2a.27
6. Rivera WM, Zijp W. Contracting for agricultural extension: international case studies and emerging practices. Wallingford: CAB International, 2002. http://www.fao.org/nr/ res/ course1/file/mod4/mod4_10.html
7. Schwartz A Lisa. “The role of the private sector in agricultural extension: economic analysis and case studies”, Network paper 48, Department of Agricultural Economics, Cornell University, 1994.
8. Census, 2011
9. According to Cellular Operators' Association of India (COAI) 2014.
10. Hanson J, Just R. "The Potential for Transition to Paid Extension: Some Guiding Economic Principles", American Journal of Agricultural Economics,2001:83(3):777-84.