

Strengthening Agricultural Extension through Krishi Vigyan Kendras

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Introduction

Agricultural extension in India is largely deployed by government, implemented mainly through government institutions and to some extent through non-government agencies. Krishi Vigyan Kendras (KVK) or Farm Science Centres as institutes of inducing behavioural change, are being managed by both government and non-government organisations. Literally, Krishi Vigyan Kendras have to serve as repository of scientific knowledge that is useful to the entire district, which is its jurisdiction. In India, agricultural extension and extension education are interchangeably used with the same connotation as used in American tradition, meaning "Extending Information" as a means of educating people to solve their problems. As a result, agricultural extension in India was more of "Informative Extension" than "Emancipatory Extension" which was more common among socialist and Christian

traditions. One can find several ideas on what is agricultural extension. It is a process to assist farm families to make decisions through which they reach their goals as good as possible.

This implies that there are two different aspects in this process

1. Adult education: the extension agents try to increase the competence of farm families in decision-making.
2. Communication: the extension organisation provides the farm family with information they need for making sound decisions.

Crucial is that farmers are free to follow the advice of their extension agents. Therefore an extension organisation can only bring about changes in the behaviour of farm families whom it tries to help them to reach their own goals better. Thus, it attempts to induce voluntary behavioural change rather than imposed changes. Voluntary behavioural change that is in the interest of the society is more useful even if it is not in the interest of individual farm families. This is essential in the changing environmental situation as a result of intensive agriculture.

Changing needs of farmers for support from agricultural extension

As a result of rapidly changing agricultural scenario at the advent of WTO, farmers have to make different decisions than in the past. They now have to face decisions on

1. Which technology to use?
2. How to manage this technology? Experience shows that the success of a technology on farms depends to a large extent on its management.
3. How to use his capital, land, labour in the most profitable way? The methodology taught in farm

management courses to make these decisions becomes more and more important for financial success of a farmer.

4. How and when to change his farming system?
5. Whether or not to take a full time or part time job outside agriculture for himself or his children? This decision is of great importance for the welfare of the farm families. Everywhere with increasing incomes, the proportion of the labour force working in agriculture decreases. Also, in India not all farm families will be able to make a decent living only from agriculture.
6. For which products is there a good demand in the market? With the rapidly changing markets, farm income depends a lot on the choice the farmer makes on which products to grow and whether he produces the quality the market requires.
7. How to increase the share he gets from what the consumer pays for his products? How and when to buy inputs and sell products? Can it help to start a co-operative?
8. How to make decisions collectively on resource use and in farmers' associations? It is doubtful whether Indian agriculture can develop successfully unless farmers strengthen their associations.
9. How to find and use the most relevant and reliable knowledge and information, which the farmer needs for making decisions? Farmers, who do not receive and use new knowledge rapidly, will have difficulties to compete with other farmers inside and outside India. But they have first to check whether the information they receive is reliable and relevant for their situation.
10. How to get credit and production inputs on time, place and at suitable rate to derive support and profits by the farmers?

It may be wise for the managers of extension organisations to decide that they will not try to help farmers with all the decisions they have to make, but to concentrate on few decisions, which the staff of the organisation is really competent. The multi-disciplinary organisation like KVK should try to make their staff competent enough to support farmers on decisions considered as important by the farmers of the district.

Changing scenario of Indian agriculture vis-a-vis rural life

Agricultural development results in an increase in the production per unit of land, labour, capital and/or other resources through adoption of more productive technologies, better management of these technologies, and combining the resources in an optimal way. Changing farming system and the changed environment of the farms, e.g. improved supply of inputs and credit, better marketing and processing of products, and better infrastructural facilities like irrigation and transportation, contribute to increased rate of agricultural growth (Van den Ban, 2000). At present, the rate of agricultural growth in India is less than 3%. But it has to grow to over 4% to accomplish a GDP growth of over 7% to double the per capita income by 2010, the target and ambition of the Government of India. The share of agriculture in national income has come down drastically from 55% in 1950-51 to 25% in 1999-2000, but the same is not seen in the share of agriculture in employment, which remains around two-third. This speaks of the magnitude of rural poverty and the underemployment in agriculture (Anonymous, 2001).

In the past, a good deal of the growth in agricultural production was achieved by bringing more land under irrigation. This road can no longer

be followed because not enough water is available. Therefore, now yields both in irrigated and rainfed areas have to increase more rapidly than in the past, mainly through increasing the competence of farmers to use the available resources most effectively. The quality of human resources available in India varies from world-class computer engineers to complete illiterates. More fall in the second category. This is where Krishi Vigyan Kendra find potential role to play in shaping farmers to become capable, decisive, proactive and self-motivated.

In large areas, the present farm practices are not sustainable. In irrigated areas, ground water is falling and there are problems with salinity. In many rainfed areas, there are serious problems with soil erosion. Nearly, 57% of the 329 m.ha. cultivated land is degraded due to wind and water erosion, salinity, desertification etc. (Shankar *et.al.* 2001). To move towards more sustainable type of agriculture, location specific technologies are required. This requires,

- (a) extension agents to not only learn from researchers but also from successful farmers, and
- (b) collective decision making on natural resource management.

Then, extension agents have to adopt different extension methods than were used in the past to support individual decision-making.

Indian agriculture is changing rapidly from subsistence agriculture to commercial agriculture. There is growing demand for horticultural and animal products. In the present agricultural knowledge information system (AKIS), Indian farmers do not only get information from government departments, but increasingly from commercial companies, successful farmers, mass media, non-government organisations and private consultants.

There is also a tendency to privatize government services and activities. India has emerged as the Information Technology (IT) capital of the world. It has given many new opportunities for farmers and extension agents to access information from all over the world. This is likely to change the role of extension agents drastically. Supplying new information becomes less important than helping farmers to find the most relevant information themselves and to use it for making decisions. The knowledge economy is all about creative thinking and risk taking. Krishi Vigyan Kendras are capable of promoting knowledge economy by encouraging farmers to take moderate risks, to think creatively and practice innovative ideas that fetch employment and income at village level.

Changing role of extension and extension education

It is implied that agricultural extension in the coming days should be quite different from what it was a few years ago. More importantly, these changes have increased the demand for more competent farmers. Together with vocational agricultural education (kind of education offered by KVKs), extension has a major role to play in developing this competence. The World Bank now realizes that knowledge is more important as a resource for development than capital (World Bank, 1999). In the literature on development, much attention is given to the optimal use of capital and so far only little to the optimal management of knowledge. The role of an extension organisation is to produce and distribute knowledge. To be able to play their role most successfully it would be important if extension organisations can get a better insight in questions as

1. How can it get access to the most relevant information generated outside the organisation?
2. How can it generate which part of the knowledge it needs itself and stimulate its staff to become more creative?
3. How can it integrate knowledge from different sources?
4. How can it store and retrieve knowledge?
5. How can it give each staff members of the organisation access to the knowledge he/she needs to improve his work?
6. How to translate knowledge into action?
7. How can it communicate most effectively with, not to, farmers?

Extension scientists who help to discover answer to these kind of questions, will be of great use to extension organisation and to farmers. For many of the agricultural problems, no extension agent can tell farmers what is the best solution, but he can only help farmers to decide this for themselves. Nobody can be certain how markets will develop and only the farmer can decide whether a change, which will probably result in a higher income, but also in more risk, is desirable.

Roles of KVKs in Agricultural Knowledge Information Systems (AKIS)

In the past, farmers got help from extension only with a part of the decisions on which technology to use in the crops/enterprises being practiced by them. However, many farmers need also help with the other decisions they have to make. With the staff and resources available, clearly no KVK can perform all the roles well. A clear choice has to be made on what roles are important and can be performed by each KVK, which are and have to be different from different KVKs.

A KVK managed by a university or an ICAR institute could act as the eyes and ears of the university or institute by learning about the situation and the problems of farmers and their experiences with new technologies and farming systems. This information could be used to make research and teaching programmes more relevant to contribute to solving major problems of farmers.

In many countries, farmers associations and cooperatives play a major role in the development of agriculture. In many parts of India, these organisations are still weak. KVKs can play a role in teaching farmers to establish and manage these organisations.

In the emerging scenario of globalization, and liberalization of markets, there is an urgent need to develop entrepreneurship among farmers. This could be done by a KVK. It requires staff members, who have an entrepreneurial spirit themselves.

It is no exception that farmers do not adopt technologies recommended by extension, because they realise that these are not the technologies which help them best to realise their goals in their situation. This is one reason why there is now a lot of interest in Participatory Technology Development (PTD) in which farmers and researchers cooperate to develop technologies, which are adopted at the needs of the local situation. This kind of technology development could be done in cooperation with KVK.

KVKs could support other agricultural development agencies in the district through training and consultancy in areas where the KVK has more technical competence than these agencies. It seems that some NGOs could become more effective by acquiring more technical competence in agriculture.

It is not necessary and probably even not desirable that all KVKs perform the same roles. There

are differences between districts in their major problems in agricultural development. These are quite different in a remote district with a large tribal population and a district near to a major city with a rapid rate of commercialization of agriculture. Also the capabilities and the interest of the staff of different KVKs can be quite different partly because they are managed by different organisations (see case 1). So, both the needs for support to agricultural development and the capabilities of the KVK staff to provide this support will vary between districts.

Case study 1 : KVK, Awagarh, Etah, Uttar Pradesh

The KVK, is managed by RBS College in Agra and has a large, well trained and experienced staff. More than half of the 12 scientists have a Ph.D and the others a M.Sc., eight of them work already more than 10 years in this KVK. Main activity of this KVK is giving training courses to rural people and extension functionaries. In 1998, 118 farmers and 114 farmwomen attended a course on agricultural production or home science at this KVK, mostly courses of 2 to 3 days. Motivational training was given to 124 members of farmers clubs. Another 337 farmers were trained on managing soil salinity problems, mainly in cooperation with a soil improvement project. Also, 74 farmers, 19 farm youths, and 87 extension functionaries were trained in soil science related courses like soil reclamation and management, soil testing and use of fertilizers.

In addition, the KVK organised 9 field days, the staff made 206 visits to villages (an average of 17 per scientist per year) and 428 farmers came up with questions to the KVK.

Together with the RBS College, the KVK organised a two-day Kisan Mela in which 1000 farmers participated. The KVK staff were also involved in several other extension activities organised by others in the district. A quarterly magazine, 8 folders and 10 circular letters were published and 14 radio talks were given. Front Line Demonstrations were

conducted on crops, goats and de-worming of buffalo calves. It is possible that there are more informal contacts between KVK scientists and farmers than are reported in the annual progress report of the KVK.

It is clear that this KVK can provide only a small proportion of the extension support farmers in this district need to increase their productivity enough to be able to compete in the market. The achievements report of this KVK gives data on the cultivated area and on the livestock population in this district, but not on the number of farm families, whereas it is the role of a KVK not to change farming, but to change people, who change farming or to change people who influence the way of thinking of farmers. An average Indian district has 2 lakh of farm families, probably in this district this number is a bit higher. The figures given above show that only a very small proportion of them could be reached directly by the KVK staff. For instance, an average farmer who has followed a three-day course, has to wait for 300 years until he can go to the next course. More farmers will have been reached indirectly, because if a farmer adopts a successful innovation e.g. cultivating a new crop, many more will follow. An illustration of this point is that the achievement report tells proudly that 9 youth found self-employment through one of the KVK courses of whom 3 earned more than Rs.1500 a month. Clearly many more youth in this district have found employment without the help of the KVK.

How to increase the impact of this KVK

1. Staff of the KVK is convinced that they are more competent than the much larger staff of the government development departments working in this district. Probably they are right but how to multiply the impact of the KVK staff on more farm families in this district. To some extent, this could be done by working through opinion leaders. It is also done in cooperation with the soil improvement project, whose staff also follow-up what farmers have learned in the KVK course. There is less

cooperation with other government departments. A reason is that the staff of the agricultural department in U.P. seems to be mainly involved in the distribution of subsidies through all kinds of projects and schemes. If this is the case, this is a serious weakness in the AKIS in this state. Knowledge is crucial in this era of rapid change to enable farmers to compete in the market (World Bank, 1999).

2. Another possibility to increase the impact of KVKs is to use a farmer led extension system. Farmers, who have increased their income as a result of their cooperation with the KVK, will show this to other farmers in their village and talk with them about their experiences, but they will have limited impact on farmers elsewhere in the district. Often farmers would be more willing to learn from one of their colleagues than from a government officer, who does not depend for his income on farming successfully. In this KVK this method is not used, because one feels that farmers are not well enough educated to be able to act as a successful teacher. But, some farmers are quite intelligent and are able to play this role well based on their experience, even if their school education is limited. Staff of this KVK have not tried to develop technology with farmers in a systematic way.
3. Increasing the capabilities of the KVK staff is very important to increase their output. The Modgal report (1996:13) stated "The KVK teachers also require subject matter training at least once in a year in SAUs, specialized ICAR institutes or any other centre identified by ICAR". In this KVK, this happened about once every three years, but the staff feel that they get enough training. It is doubtful whether they realise how rapidly Indian agriculture is

changing and hence how rapidly they have to change to be able to provide leadership in this process of change. If farmers elsewhere increase their productivity more than farmers in this district, farmers here will have difficulties to compete.

4. A serious bottleneck for the agricultural development of this area is the weak marketing system. KVK staff, preferably an economist, need to help farmers to improve their marketing to ensure that the profits made in this system do not go mainly to the traders, but also to the farmers. The RBS College, which manages the KVK has a large project to calculate the production cost for various products, but the results of this project are not used for farm management advice.
5. It is evident that this KVK staff provide only support on decisions on the adoption of technologies. Some staff of the KVK say that the KVK should provide support for all the decisions farmers have to make. Others say that the KVK staff is only capable to give advice on the adoption of innovations and hence should restrict itself to these decisions. Clearly, if KVK decides to support farmers with more decisions, retraining of the staff is necessary. A clear decision on the range of support to farmers the KVK will provide should be taken. Criteria for this decision should probably be:
 - which kind of support is more important for the welfare of the farm families?
 - which kind of support is most important to stimulate farmers to produce the products the market needs?
 - which kind of support can the KVK provide better and/or cheaper than other actors in the AKIS?

6. Location of the KVK can have a lot of impact on its success. This KVK is located in a rather remote area where the supply of water and electricity is not assured and where is a rather high rate of criminality like theft and burglary. This makes it not attractive for the KVK staff to live on the campus. Lack of education, health and other facilities in the area also add to the problem. Remote location results that most farmers in the district have to make a special trip to visit the KVK and cannot combine it with a trip for shopping or other business in the district capital.

KVK—As a potential employment generator

It was shown a long time ago that with increasing average income, the proportion of the labour force which can find employment in agriculture decreases (Clark, 1957). If people who are forced to leave agriculture, can find employment in more productive jobs outside agriculture, the national income will increase as a result of this transfer of employment. However, at present in India, the only alternative for many is to join the unemployed in the cities. These problems can also be caused by depopulation of areas, which have unfavorable conditions for agricultural production.

One solution is income diversity (Ellis, 1999). There is no reason why a farm family should only earn income from farm and not from other possible enterprises like tourism, local crafts and trade. An advantage is that it decreases the depopulation of rural areas (see case 2).

Case study 2: Helping the national cause by being self employed—Case of a farmer entrepreneur

Green revolution in India had both positive and negative effects on the overall farming and on

individual farms. Irrigated areas suffered from alkalinity and salinity. One such farm belonged to Shri. Gopalakrishna of Panikampatti village, of Karur district of Tamilnadu state. Soil in his farm became alkaline and pH was ranging from 9.2 to 9.5. Sugarcane productivity was reduced from 50 tons/acre to around 40 tons/acre in spite of applying more quantity of fertilizer. In 1997-98, his expenditure on fertilizer was Rs. 1.5 lakh for his 12 hectare farm. Farming became economically unsustainable. That was the point when he approached KVK Tiruchirapli, located about 20 kms from his farm, for advice. Farmer was advised to increase organic component in the nutrition package to different crops, and the best is vermicompost. He was offered a course in vermicomposting at the KVK.

Soon after, he went to Annamalai University and procured 25 worms and started his venture on vermicomposting. In about 4 years, the farmer has invested nearly one lakh rupees and is producing 50 tons of vermicompost annually. During 2000, he sold 15 tons of the compost at Rs. 5000/- per ton and applied 30 to 40 tons to his 4 ha land where sugarcane yields are now scaled to its peak (52 tons/acre) without applying chemical fertilizers. He is breeding good quality earthworms and selling them. He has developed expertise in identifying pure breeds of worms and successfully multiplying worms belonging to three species to sell them to potential vermicompost producers.

He is experimenting on producing vermiwash, nothing but the collection of water passed through worms collected in a tank specially designed by him, which can be sprayed to supplement with the nutrients and to see whether it can protect his crops from pest and diseases. The farmer is trying several ideas to produce compost in thatched sheds to improve the economics of compost production and to produce more, which are the two major limitations of compost production in cement tanks. He is aware that this can be done only in winter and non-rainy months. The farmer is regularly being invited to KVK as a resource person to share his experiences in the training programmes. His dream is to make his 12 ha farm totally organic and to become a consultant

on earthworm multiplication, vermicompost production and its application.

Labour productivity in agriculture is related to the ability of farmers to compete in the market. The World Bank estimates that the range in average added value per worker in agriculture per year is from \$69 in the Kyrgyz Republic to over \$41000 in the Netherlands (World Bank, 1998). In India this value was \$ 404. There is tremendous potential to increase labour productivity in Indian agriculture. However, realising this potential will require a decrease in the proportion of the labour force working in agriculture. In many countries, over 60% of the labour force works in agriculture. As long as this proportion does not decrease drastically, the majority of the farm families will remain poor whatever the extension service does to increase productivity in agriculture. In many parts it are mainly the males who find a full-time or part-time job outside agriculture. Their wives and perhaps their daughters remain in the village to manage the farm. This results in a process of feminization of agriculture. Vast majority of the village extension agents being males, reaching women farmers to spread the technologies or to train them on the skills required to adopt such technologies would be time consuming and often half-hearted. Understanding the problems of the women on the farmers would be very difficult for the male agents (Maarse, *et al.* 1998). Depopulation of rural areas also leads to social problems. Hence migration from rural areas are to be arrested as well as they have to be encouraged to take up employment in rural based enterprises which are mainly led by women and their associations.

KVKs can play vital role in organising women into SHGs and facilitate them to function unitedly to achieve what best they can do.

Conclusion

While drawing conclusions from the various issues, views and facts discussed above with a pointed focus of strengthening agricultural extension through Krishi Vigyan Kendras in the Indian context, it may be said that as the agricultural extension is the most guiding and determinant factor of stimulating agricultural development, the KVK, is the most vibrant, efficient and apt component of agricultural extension instrument.

Hence, it is to be stressed that KVK must play the roles as follows for accelerating agricultural productivity and production by using scientific, eco-friendly affordable technology and empowering farmers to take decisions in their scheme of things.

- i. Help farmers in adoption of more productive technologies – seeds, fertilizers, agro-chemicals, mechanization and of their management.
- ii. Support farmers in combining available resources in an optimal way.
- iii. Convince farmers to change in their farming system
 - Switching to the production of crops with a higher value
 - Switching from crop production to animal production
 - Specialization in crop cultivation.
- iv. Help farmers change their farm environments
 - improvements in the supply of inputs and credits
 - better marketing and processing of products
 - increasing the proportion the farmers get from what the consumers pay for agricultural products
 - improvements in transportation, drainage and irrigation

- change in agricultural policies of the government.

To be able to perform these roles properly in many KVKs a major retraining programme of their staff would be necessary.

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