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Successful Agricultural Extension Agencies Are Learning Organizations

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Introduction

The theses discussed in this chapter are:

1. Agricultural extension agencies have to change rapidly in the next decades because their environment is changing.

2. This change cannot be realised unless these agencies become learning organizations.

3. It is a major task of extension managers to guide and facilitate the process of change towards a learning organization.

To support these theses it is necessary to discuss:

1. How the environment of agricultural extension agencies is changing:

- change in agriculture,
- change in educational level of farmers and extension agents,
- change in input supply and marketing,
- change in the Agricultural Knowledge and Information System,
- privatization of extension organizations.

2. How the role of agricultural extension agencies in the process of agricultural development is changing as a result of these changes in their environment.

3. How becoming a learning organization can help an extension agency to change.

4. How extension agencies can become learning organizations.

Clearly the processes of change are different in different parts of the world. In a country where 75% of the labour force works in agriculture with little economic growth, these processes are very different from a country where one can produce enough food with 3% of the labour force in agriculture or a country with growth in gross domestic product of over 8% a year. I will focus on the situation in South and East Asia where probably most of the readers of this book live. But changes there are influenced by changes elsewhere in the world and it is desirable to profit from experiences elsewhere.

In the theory of management regularly new theories are developed. Not seldom the person who develops such a new theory exaggerates the value of his theory. He may even believe that his theory will solve all problems which other theories could not solve satisfactorily. Recently considerable interest has been developed in the view that an organization should be a learning organization. I am convinced that in this way an extension agency will be better able to adjust to its rapidly changing environment. But that also many of the older theories are still valuable to increase the effectiveness of extension agencies. However, in a short chapter it is not possible to discuss all these theories satisfactorily. That is the reason to concentrate on the importance of becoming a learning organization.

Nobody can predict how extension agencies will change in the next decades. My thesis is that changes are necessary, because the environment is changing rapidly. I do not hope that the reader will accept all my ideas about the direction of change in extension agencies and their environment. But the reading of this chapter will help him to think about which changes are likely and which are desirable in the area where he works. If he comes to different conclusions than this chapter, my goal has been realized. However, it is to me very unlikely that somebody can come to the conclusion that not much change in their extension agency is needed except an increase in the efficiency of performing its present tasks.

The Changing Environment of Agricultural Extension Agencies

Change in Agriculture

Thirty years ago many people were afraid that millions would die from hunger, because we would not be able to produce enough

food for a rapidly growing population. This did not happen mainly as a result of the successful green revolution. However, at present the danger of serious food shortages in the near future returns (Tribe, 1994, IFPRI, 1995).

In many Asian countries the demand for food increases not only because the population is growing, but mainly because as people become more prosperous, they like to eat more animal products, vegetables and fruits. At the same time the increase in yields per ha is slowing down, because

1. the potential increase as a result of green revolution technologies has been realised to a large extent,

2. environmental problems such as soil erosion, pollution and salination cause a decrease in yields; many of the present farming systems are not sustainable, and

3. investments in agricultural research and extension have decreased.

Also a large proportion of the increase in food production in recent decades was possible because more land was brought in cultivation or under irrigation. The possibilities to continue with these two processes are very limited.

With the introduction of the green revolution blanket recommendations to all farmers often worked well. The wheat varieties developed in Mexico made many Indian and Pakistani farmers happy, because they got a large increase in yield. Present day problems require often much more location-specific solutions. This is quite clear with Integrated Pest Management, where most of the pesticides are replaced by an understanding of insect ecology and knowledge of the prevalence of different kinds of insects in each field. It is also true for irrigation management and fertilizer application, which require that the right kind and quantity of fertilizers and the right amount of water is applied at the right time according to the needs of the field and the crop. The diversity and complexity of farming problems are increasing. Solving these problems not only require new production technologies, but the optimal management of these technologies is at least as important. But so far this management did not get enough attention from research and extension.

There are two other aspects of agricultural development, which are often even more important for solving farmer's problems than a change in production technology.

Firstly, a change in farming system to utilise the new opportunities in the markets as a result of increased prosperity of the consumers and increased international trade (van den Ban and Bauwens, 1988). Recently I was told in the Philippines that a farmer can earn from one hectare of lansons, a fruit, as much as from 40 ha of irrigated rice. To choose the kind of crops and/or animals which give highest income is often the most effective way to increase farm income. This does not mean that production technology is no longer important, because with market liberalization a farmer can only make a profit when he produces in a more efficient way than most of his competitors.

An extension agent may be able to tell a farmer what is the best production technology, but he cannot tell them what is the best farming system. One reason is that this depends on the interests the farmer has in different crops and animals. Only a farmer who likes dairy cows will be able to make a profit from these cows. Another reason is that it depends on the changes in the prices of different products over a longer period. No extension agent can predict these changes; this is the farmer's risk. He can only help the farmer to think in a systematic way about which changes in demand, supply and government policies are likely and about his ability to take a risk.

Secondly, increasingly solving many farmers' problems is no longer possible through individual decision making, but only through collective decision making. This gives farmers' organizations an important role in soil erosion control, irrigation management, input and credit supply, product processing and marketing, organizing educational facilities and influencing government policies. In industrialised countries these organizations play a major role in agricultural development, but in many developing countries they are weak and they often organized by government officers or other outsiders for the farmers instead of by farmers themselves (Daouda and Pesche, 1995).

Our conclusion is that competent farmers are a major condition for successful agricultural development. They should be able to

make decisions themselves on the choice and the management of production technologies, the choice of their farming system and the way they cooperate with their colleagues in collective decision making and for influencing the environment in which they make a living.

Educational Level

Forty years ago when extension was introduced in several countries, one could only find Village Extension Agents (VEA) with a low level of education, perhaps primary school and a course on agriculture of several months. They had to be given clear instructions what to do otherwise they might make mistakes. At present, however, in several countries a B.Sc. degree is a condition to get an appointment as a VEA. These VEAs have more years of education than most VEAs in the Netherlands had a generation ago. These Dutch VEAs had considerable influence on changes on production techniques and farming systems, because of the confidence farmers had in them. With their present level of education many Asian VEAs should be quite capable to make location-specific decisions on how they can best support agricultural development.

Also the level of education of farmers has increased a lot. Forty years ago most Asian farmers were illiterate, but in countries like the Philippines and Thailand one can now find in many villages farm women with high school education. This makes it much easier for them than for their parents to find relevant information for decisions on their farm themselves. Also they are better able to play a leadership role in farmers' organizations. This is not yet true in countries with a low rate of adult literacy as in Bangladesh, Pakistan and India.

Through this development farmers became less in need of extension recommendations. Instead they are in need of a discussion partner with whom they can discuss the consequences of different ways to develop their farm. With their present educational level it is possible to train the VEAs to perform this role properly, although outside NGOs this is seldom done.

Input Supply and Marketing

With the change from subsistence farming to commercial agriculture the support of the farmers by companies and coope-

ratives for supply of inputs and marketing of products is now of great importance. Thoday I visited a farmers' cooperative in the Netherlands which sells an average member about $200, 000 a year in feeds, fertilisers, agro-chemicals and other inputs and which employs one extension agent per 35 members in a region where nearly all the farm work is done by members of the farm family. This level of support has not yet been reached in Asia, but there is a clear movement in this direction. There is a large number of traders who could and often do give advice on the use of their products.

The Changing Agricultural Knowledge and Information System

This development of agribusiness firms is only one of the reasons that the Agricultural Knowledge and Information System (AKIS) is changing (See Röling, 1994, van den Ban, 1993). The time that agricultural research and extension are the monopoly of government agencies is over in many countries. Agribusiness firms develop new products, plant varieties, agro-chemicals, feeds, etc., which only give good results if the farmer uses them properly. A farmer who uses these products wrongly, will often blame the product and not himself for the poor results. Hence, teaching farmers how to use these products will often have favourable effects on the market share of the company. Some companies go even further and help their customers to increase their competence as farm managers. These companies realize that competent farmers are often able to enlarge their enterprise and it is not likely that they have to leave farming, because they cannot make a living. Also banks realize increasingly that by combining farm credit with management advice, their borrowers will be better able to repay their loan in time and less likely to default. Commercial firms are for the farmers; also their major source of information on prices and changes in consumer demand, but in deciding which information they offer the interest of the company usually carries more weight than the interests of their customers.

Farmers are a very important source of information. Many farmers experiment with new technologies and make in this way valuable contributions to the development of location-specific knowledge. They play the major role in the development of new farming systems. It is very difficult to test a new farming system on an experiment station. It is quite important for a farmer to be correctly informed about the trustworthiness of different business

partners. Usually the most valuable information on this topic is with his colleagues.

A country where farmers are willing to share this knowledge with their relatives, friends and neighbours has an important advantage in the competition over countries where one is not willing to do so.

Information from farmers is not only important for decision making by other farmers, but also for decisions on extension and research programmes and government policies.

Information on government policies with regard to prices, land use, the environment, etc., becomes more and more important for decision making by farmers.

Traditionally, agricultural research is considered to be the most important source of information for extension agents in developing countries. This is contrary to the situation in industrial countries, where many extension agents have always been convinced that they could learn more form the best farmers in their area than from researchers. Also here, however, research is an important source of information. If farmers in developing countries do not adopt the new technologies developed by researchers one was in the past convinced that this was caused by their lack of education and/or the traditional way of thinking farmers. In recent decades one discovered that this is often not the reason, but that this is caused by weaknesses in the way the research is done. These weaknesses include that researchers often

- have not given enough attention to the situation of the farmers, for instance to the fact that most of them are resource poor,
- have not given enough attention to the goals of the farmers, for instances by giving recommendations which would increase yields, but decrease farm income, and
- studied a problem often only from the point of view from their own discipline without taking an integral view of the farm as a whole as farmers do. As a result they many not realize that their recommendation requires so much labour in a busy period that following it for the crop they study would decrease the yield of other crops, because the farmer would not have the time to take care of these crops properly.

This is changing now through more interdisciplinary research and a better communication from farmers and extension agents to researchers. Farming Systems Research, Rapid and Partcipatory Rural Appraisal and similar methods contribute to this change (See Chambers and Guijt, 1995, Singh and Schiere, 1995). There is, however, much variation in the extent to which this reorientation in research strategy has already been realized.

In many countries also the role NGOs and farmers' associations play in agricultural extension is increasing rather rapidly. After an initial enthusiasm for working through NGOs one is now realizing that there is a large variation among the NGOs and not all of them use their resources in a way which makes an optimal contribution to rural development. Othen they have a staff which is really motivated to help poor people. Their structure is usually much less bureaucratic than in government agencies, which makes it possible to use a participatory approach taking into account the needs of the local situation. In some NGOs local people have considerable influence on decision making. Others are managed by a staff with an entrepreneurial spirit, who are dissatisfied with their work in a government agency, because bureaucracy and politics made it difficult to work effectively and becasue their salaries were low. Therefore they established an NGO and got support from foreign donors. They lost much of their job security by leaving the government, but could work more effectively and earn more. Not seldom a condition for foreign support is that they help rural women to improve their situation. Other NGOs get financial support from private business houses.

In many NGOs most staff members are social scientists often from an urban background, who lack technical competence needed to develop agriculture. Some NGOs are able to give considerable financial support to their beneficiaries from the support they receive from foreign donors. Usually they work in a small area and it would never be able to give this support nation wide. Sometimes many NGOs work in the same area, where they compete with each other and with government agencies for beneficiaries. Most rural people are very happy to get financial support, even if in the long run they would profit much more from education to increase their competence. This can make it difficult for government agencies, which cannot give this financial support, to compete with these NGOs.

The way information from these and other sources becomes available to farmers changes because of changes in:

- the technology of and electronic and mass communication,
- the availability of different communication media to farmers,
- their willingness to pay for information,
- the cooperation and competition between different actors in the AKIS,
- the ability of farmers to influence these processes through their organizations,
- the eagerness among farmers to search for information which helps them to make better decisions,
- etc.

Privatization

In many countries there is strong tendency towards the privatization of government agencies, because many governments got serious debt problems by spending more money than they receive from their taxpayers. Therefore they are not able to continue to pay for all these agencies. The experience is also that many government agencies do not perform their task in an efficient way. One expects that these agencies would be forced to become more efficient if they are paid by the people who use their services. Foreign donors, especially the World Bank and the IMF, have put strong pressure on governments to balance their budget through privatization (e.g., Umali and Schwartz, 1994). Agricultural extension agencies are one of the agencies which should be privatized in their opinion.

Also in some developing countries, e.g., India, governments channel increasingly a part of their development budget through NGOs rather than through their own agencies. They expect that these NGOs will achieve more results than the rather inefficient government agencies.

Role of Extension Agencies in Agricultural Development

Towards a More Participatory and Educational Approach

Partly as a result of the success of the green revolution technologies, the task of the agricultural extension service in developing countries was often to promote Transfer of Modern

(= research based) Technologies. Farmers were expected to be obedient and to follow the recommendations of their extension agents. The previous discussion shows that in the present era there is more a need for an educational approach to increase the competence of the farm families to make their own decisions. Not all farmers will make the same decision, but their decision will depend on their agro-ecological and socio-economic situation and on their goals and values. Farmers differ e.g., in the availability of land, labour and capital and in their willingness to take a risk. In calculating the profitability of an investment it makes a lot of difference whether the farmer can use the money from his savings account, which gives 5% interest a year or he has to borrow from a moneylender at a rate of 5% a month. In a valuable report John, et.al. (1993) analyse how the present need for location and situation specific recommendations instead of the blanket recommendations from the past make it necessary to change towards a more participatory approach in extension.

In fact they confirm the ideas which Hayward (1989) developed on the basis of his experience with World Bank extension programmes mainly in rainfed areas. He analysed in which situations an authoritarian, bureaucratic approach to extension is desirable and in which situations a participatory approach is required. His conclusion is that the first approach can work well if one knows with a high degree of certainty which technologies will help farmers to reach their goals better and knows their socio-economic characteristics quite well. The less this is the case, the more participatory the approach to extension should be. Often a consultative approach is necessary, where extension agents and farmers test together through which changes in farming methods and systems desirable results can be achieved. Farmers should also have considerable influence on the kind of support the extension agency provides them. It should be mainly the farmers and not the extension staff who decide which changes in farming are desirable. Recent changes in the environment in which extension organizations operate, require also a change towards a more participatory approach to extension.

In the past Training & Visit Extension has usually been conducted in an authoritarian way, although in theory this system

has a strong field and farmer orientation (Benor and Baxter, 1984: 10). In reality in most countries it is much more a top-down system. Unless this can be changed towards a more participatory approach, T and V may no longer be the best extension system for the next decades. Many Asian countries have already abolished this system.

So far agricultural extension has been much more successful in areas which are well irrigated than in rainfed areas. The agro-ecological situation is much more uniform in the irrigated areas which makes it better possible there to make standard recommendations. In the diverse, complex and risk-prone farming systems of rainfed areas the optimal farming methods are much more location-specific. This makes it much more difficult to do agronomic research in these areas. Often it is necessary to discover in cooperation with the farmers' location-specific solutions for their problems. In recent years the interest of extension agencies in helping rainfed farmers to solve their problems has increased. Without this help many of them might be forced to migrate to the cities and increase the social problems there which are caused by lack of employment and poverty. This is another reason why the interest in participatory approaches in extension has grown rapidly (Chambers, 1993, Ch.5).

Agricultural extension often provides farmers with knowledge on the consequences they can expect from different behavioural alternatives, e.g., from growing a crop with and without fertilizers. Research on change in attitudes and behaviour shows, however, that behaviour is not only influenced by knowledge, but also by the expectation regarding this behaviour from the social environment of the farm family and by its "self-efficacy", the perception the farmer has on his ability to perform a taks well (Ajzen, 1988, van den Ban and Hawkins, 1996). Hence, extension should also try to influence these expectations and this self-efficacy. An interesting way to do this are the farmer field schools, which are used on a large scale in Indonesia for training in Integrated Pest Mangement (Van de Fliert, 1993, Dilts and Hate, 1996). In these schools one considers a rice field as a book, which provides a lot of information on the ecology of rice pests and diseases. The task of the school is to teach the farmer how to read this book, not to tell him what is written in the book. The role of the trainer is to facilitate farmers to make the

right kind of observations in his rice field and to interpret these observations. Groups of farmers go once a week in the rice field to observe how the crop grows, how this growth is influenced by the prevalence of pest and diseases and how these pest and diseases are influenced by ecological factors such as the prevalence of predators of the pests. As far as possible the trainees do not learn from listening to their trainer, but from their own observations and their discussions about the correct way to interpret these observations. Many of the successful trainers are not extension agents, but farmers themselves who are trained to become a facilitator in these schools.

There are two reasons to use this approach. Firstly, the book tells a different story about each rice field. That makes it necessary to train the farmer to make his own decisions on the management of his rice field. It is quite impossible for the extension agent to make the observations needed to make this decision for each field. In the school farmers discuss the decision with their colleagues, who will support them in their decision to decrease the use of pesticides drastically. Secondly, this increases also the self-efficacy of the farmers. They discover that they have gained the capability to make their own management decisions and do not have to follow the recommendations of their extension agents obediently.

These farmer field schools are a part of a large movement towards Participatory Technology Development. Farmer-led Approaches to Extension and the integration of indigenous and scientific knowledge (Scoones and Thompson, 1994, Scarborough, 1996 and Warren, Slikkerveer and Brokensha, 1995). This is movement to enhance agricultural development by making full use of the experience, knowledge and intelligence of farmers. These are important resources for development which often have been neglected in the past.

A conclusion of this discussion is that it is now much less than in the past the task of the extension agency to transfer new technologies. Instead a much more educational approach is necessary, which increases the competence of farmers to make their own decisions and to learn from their experiments and from those of their colleagues. It is important to realize that in education it is not important that a teacher teaches, but only that a student or farmer learns. Teaching may be the most effective way to help a

student to learn, but facilitating his own learning processes and his own discoveries can be more effective.

Leadership Style

A more participatory approach to extension requires not only a change in the relationship between extension agents and farmers, but also a change in the leadership style and the culture of the whole extension agency. A participatory approach cannot be realized if the managers order their field staff what they should do. It requires support to the efforts of the field staff to find together with their farmers the best solution for the problems this group faces (Pretty, a.o. 1995). It is my experience in the Netherlands as well as in developing countries that it is more difficult to change the behaviour of village extension agents (VEAs) than of farmers and even more difficult to change the behaviour of extension managers than of their VEAs. One reason is that farmers are often rewarded when they change their behaviour, because this results in an increase in their income. A change towards a more participatory approach in extension often results in more work and more risks for the managers, but the rewards are much less clear for them.

A special case are the countries were the top managerial positions in the extension agencies are not fulfilled by agriculturists, but by members of the administrative service, who have experience in managing quite different organizations. If they are well trained in management they know that the optimal leadership style depends on the extent to which knowledge and beliefs about cause/effects are complete and the standards for desirability are crystallized (Thompson, 1967). In an agricultural extension agency this is much less the case than in many other government agencies. However, quite a number of these administrators are inclined to apply the leadership style which worked well in other government agencies in which they have experience also in an extension agency. An extension agency requires a more participatory style of leadership than e.g., the revenue service. Revenue officers have to follow the rules and regulations strictly otherwise, there is a real danger of corruption. As we discussed in Section on 'Towards a more participatory and educational approach', at present a much more participatory approach to extension is needed than at the time of the first introduction of the high yielding varieties.

Agricultural Knowledge and Information Systems

The changes in the AKIS require also changes in the role extension agencies play in agricultural development.

In the past extension was based on the assumption that farmers need new information. Modern information technology gives some of them easy access to a wide range of information from all over the world. Now the problem becomes more:

1. How to find the most relevant information?
2. How to evaluate whether the information provided is reliable or not?
3. How to integrate information from different sources and how to use it for decision making?

This implies a change in the role of the extension agent from making recommendations to his farmers to facilitating their decision making and information processing. One way to do this is to stimulate that farmers learn from each other e.g., by organising study groups in which they try to discover together what is the best way to grow a crop.

As the AKIS is changing rapidly, it is not likely that the public extension agency can continue to play the same role it has played in the past. Instead extension management should analyse what are the strengths and weaknesses of its agency compared to other actors in this system. This makes it possible to decide what will be the most useful role this agency can play in the future and what changes in the agency are needed to be able to play this role quite well. A good example of such an analysis is given by Chowdhury and Gilbert (1996). Commercial companies and cooperatives may be better able than the public extension agency to provide large commercial farmers with the information they need on production technologies, if there is no conflict of interest between the firm and the farmer.

In some situations it may be necessary to admit that farmers have more confidence that the staff of NGOs tries to help them to reach their goals than that public extension agents try to do so. However, the knowledge of agricultural production technologies of the NGO staff members is often limited. In such a situation one can consider whether the public agricultural extension agency should work with the farmers directly or it should try to increase the competence of

NGO staff members, who work with farmers. With the limited resources available for agricultural extension, it is not in the interest of the farmers if different agencies compete with each other. It is better for the farmers if they cooperate with each other, recognizing each others' strength and weaknesses.

Privatization

Many public extension agencies have been privatized recently because farmers force this agency to become more cost conscious and to provide information for which farmers feel a need (Umali and Schwartz, 1994). Otherwise farmers will not pay for this information. A farmer does not have to use the public extension agency, but he can ask for help from the source of information which he considers most competent, who provides his information in a way which makes it easiest to use in his decision making process and/or who provides this information for the lowest price. Privatization is a way to force the extension agency to change from an organization which is driven by the supply of research findings to an organization which driven by the demand of the farmers for information. With regard to this price of this information, the farmer may not realize how much he has to pay if the cost of advice is included in the price of agro-chemicals, feeds or other inputs.

Another advantage of privatization can be that the farmer is more inclined to use the information for which he had to pay than information he got free of charge.

Unfortunately one often forgets that this privatization has also disadvantages which have to be balanced against the advantages. We see as major disadvantages:

1. It inhibits the free flow of information. Extension agents have to recover the costs of providing information. Hence they will not stimulate that mass media make this information available to everybody free of charge or that farmers pass it on to their colleagues.

2. Extension agents will choose target groups which are able and willing to pay for information and use extension methods which make it possible to collect payment from farmers. They may not use e.g., a result demonstration, not because this is not an effective extension method, but because it is not possible to let

farmers pay for seeing this demonstration. They will also choose large commercial farmers as their target group and not resource poor farmers who may not be able to pay for their information.

A public extension agency may needed next to the privatized agency in order to be able to support the poor farmers. For a privatized extension agency it will also be difficult to stimulate farmers to follow environmental laws and regulations. Many farmers are not willing to pay for this activity as they consider that these laws and regulations are against their (short term) interests.

Proponents of privatization usually assume that it is farmers who profit from extension and therefore it is fair that they pay for this service. In reality the consumers often profit more than the farmers. Good extension work increases productivity in agriculture. Through competition this will decrease food prices.

A privatized extension agency needs staff members who are commercially oriented. In order to survive the staff members should develop information products and services, which they can sell at a profit. This can e.g., be an advice based on soil tests to use fertilizers in an optimal way. To change towards such a commercial role is often difficult. After privatization of the public extension agency in the Netherlands half of the extension agents had to be asked to find an other job, because they were not able to make enough profit for their agency.

Extension Agencies as Learning Organizations

Generating and Communicating Information

In many extension agencies there are rules how each of the staff members should contribute to the realization of the goals of the agency. Let us hope that these rules are developed in such way that they were the best possible rules at the moment and they were introduced and are not too much influenced by internal and external politics. Even then it is highly unlikely that the rules help the agency over a longer period to function as good as possible. Its environment changing and as a result the way each staff member works should change. The agency will have to learn continuously how it can adjust to the needs of the changing environment. An interesting analysis of this learning process is given by Sprenger a.o. (1995). The organization should:

1. absorb new information developed outside the organization,
2. generate new ideas inside the organization,
3. diffuse this information and these ideas to the relevant staff members,
4. exploit this information and these ideas to develop new products and procedures to work more effectively.

It is a major management task to organize this learning process in order to enable the extension agency to contribute as much as possible to agricultural development and to support the decision making of the farmers as good as possible in a changing environment (See Pretty a.o.,1995). In Sections on 'The Changing Environment of Agricultural Extension Agencies' and' Role of Extension Agencies in Agricultural Development' we discussed many changes in this environment which make it necessary that extension agencies perform different roles than in the past, perform these roles in different ways and change their organization and leadership style to be able to do this effectively. In this process unlearning old ways is often more difficult than learning to perform in new ways.

Information which has to be absorbed from outside the extension agency includes information:

1. from research and from markets about new opportunities for agricultural development,
2. from farmers about their constraints in realising these opportunities and about their experiences in developing new opportunities themselves,
3. about changes in government policies,
4. about new strategies and methods to communicate effectively with farmers,
5. from farmers about their reactions to present extension programmes and methods,
6. which can help to increase the effectiveness of human resource development and the motivation of the staff members to realize the goals of the extension agency.

It should be clear who in the extension agency is responsible for *collecting* each kind of *information* in time. This does not mean that

if another staff member finds useful information he should not pass it on. Often one notices too late that a new kind of information becomes important for the extension agency. In the Netherlands e.g., we noticed too late that computers became a useful tool for extension, because nobody was responsible for this task.

To generate extension messages information should be integrated from research in different disciplines, from markets, government policies and from experiences of farmers. This information will enter the extension agency through different staff members. Only if they have easy access to outside information sources, e.g., through publications or personal interaction with relevant outsiders, such as researchers, they can be expected to perform their task well. These staff members should be rewarded if they contribute to change in the extension agency through introducing relevant new information. Several ISNAR publications analyse how an effective linkage between research and extension can be organised, e.g., Merrill-Sands and Kaimowitz.

Also their cooperation with researchers and with farmers in developing extension messages should be well organized. One of the weaknesses of the T and V system is often that one gives the farmers the same recommendations they have heared already for years. There is not enough generation of new knowledge or this knowledge does not reach the VEAs. Often the extension agency also fails to analyse why farmers have not yet followed these recommendations. Usually they have good reasons to do so.

For decisions on extension strategies and methods, information can come from research in the social sciences, from experiences of other units in this extension agency and of other change agencies and commercial firms and an evaluation of present strategies and methods. The development of Farming Systems Research and of Rapid and Participatory Rural Appraisal has increased our ability to get a good understanding of the opportunities and constraints farmers face. Much of this information is also known to good VEAs but unfortunately this information is not always used in planning and implementing extension programmes. It is also necessary to be well informed about the way the agricultural knowledge and information system is changing.

For successful agricultural development extension has to be combined with other ways to support this development such as an improved supply of inpus and marketing of products (Mosher, 1996, van den Ban and Hawkins, 1996). It is important to try to find the optimal way to combine these different instruments to stimulate agricultural development. This requires that the extension managers learn what are the crucial bottlenecks in this development process. Most of this information will have to come from farmers often through the observations of the village extension agents.

Management of an extension agency requires that the manager has a clear and accurate view of the way the extension agents are performing their task and the difficulties they face in their work. In many extension agencies it is difficult for the managers to obtain this information, because his staff members fear that they will be punished if their boss discovers that they do not work in the way he considers desirable. They are working on a distance from the headquarter and lack of transportation and urgent paperwork makes it often difficult for their boss to go to the field and see and hear from farmers how the extension agents work. Therefore these agents can make it quite difficult for their boss to obtain an accurate view of what is happening. On a staff meeting they will be inclined not tell anything what might result in punishment.

The manager should try to develop an organizational climate where the whole staff feels that they should work as a team to serve the needs of the farmers and help each other to overcome any difficulty they face in doing this well.

For decisions on the organization of the extension service we need information from sociology and psychology of organizations, from experiences of other organizations, especially change agencies, and from evaluation how the extension agency functions at present. We said for instance that in many extension agencies a more participatory style of leadership is desirable. This is a rather vague statement, which does not give clear indications how the manager should behave. It is not possible to give a recipe, which guarantees success when it is followed by the manager. Crucial is that he develops a leadership style which suits his situation, the kind of changes his agency is facing, the expectations and abilities of his stafff, his own personality, etc. What he can do is learn from other organizations, where a more participatory leadership style is

already practised. Government agencies might e.g., learn from NGOs (John et. al., 1993), but they should not try to duplicate their style, because their situation is different. This example can help them to think about which style is possible and desirable in their situation. Next they can practise what seems to be an effective leadership style, but it is necessary to evaluate this experiment to develop a style which is really effective.

Generating the new knowledge which an extension agency needs quite often requires the cooperation between people inside and outside the agency. ISNAR has shown that a cooperation between extension agents and researchers in on-farm trials makes these trials more cost effective and usually results in more valuable results (Merrill-Sands and Kaimowitz). Generating the knowledge which is needed to improve complicated cropping systems such as mixed crops or crops grown on slopes with a large variation in soil conditions requires a cooperation with the local farmers. As we discussed in Section on 'The Changing Agricultural Knowledge and Information System' these farmers also play an important role in developing new farming systems. An interesting analysis of the way an extension agent can learn by supporting the learning processes of his farmers is given in a published Ph. D thesis of an Australian extension agent (Hamilton, 1995). This study is a part of a research programme directed by Röling which tries to help rural people to learn how they can influence their own future (Röling, 1996). This implies a process of experiential learning, that is not learning from the theory presented by the teacher, but from observing and reflecting on concrete experiences, forming abstract concepts and generalizations based on these experiences, experimenting with these concepts and generalizations in a different situation and learning from observing and reflecting on the results of this experiment (e.g., Tennant, 1988). This experiential learning is based on Lewin's idea: If you want to understand something, try to change it.

In the culture of most extension agencies it is easier to *diffuse information* on new policy decisions or research results than information on an important idea which one VEA has learned from a farmer. This information can be very valuable to his colleagues. Unfortunately they are often expected to learn from their superiors and from the SMSs, but not from their colleagues. In many

extension agencies the system of horizontal communication between staff members working on similar problems requires strengthening.

For *exploiting information* often teams of staff members with different kinds of specialisation and working at different levels have to be established. It is more a rule than an exception that it is desirable to include also people from outside the extension agency, e.g., from research institutes in these teams. The previous discussion may give the impression that these teams should be provided with a very large amount of information.

However, one should not aim at a maximum level of information, but at an optimal level. The cost of collecting, generating and processing extra information can be higher than the contribution it will make to improved decision making. This is one of the ideas behind Rapid Rural Appraisal (Chambers, 1993: ch.2). Also each staff member should only receive the information which is relevant for his/her work; otherwise (s) he would be overloaded.

Usually, there will be different staff members of the extension agency who play a major role in absorbing, generating, diffusing and exploiting new information. This is partly because each role requires a somewhat different personality. Absorbing information from research requires a staff member who likes to keep up-to-date with scientific literature, whereas for the diffusion of this information one needs a person who can relate easily with his colleagues in a formal as well as in an informal way.

Some of the knowledge and information is available in handbooks, e.g., on plant diseases. Much of this knowledge and information is, however, only available with the heads of staff members, who might not be well aware of this knowledge themselves. We think e.g., about the way they analyse the problems their farmers face or the method they conduct a group discussion. This makes it difficult to transfer this knowledge and these skills to other staff members of their agency. Helping them to analyse these skills and to understand e.g., why some extension agents are more successful in conducting group discussion can be an important way to learn how the effectiveness of the extension agency can be increased. Taping and analysing these discussions can be one way to do this.

By managing these four processes (absorbing, generating, diff-using and implementing information) properly an extension agency can develop into a learning organization, that it is an organization which facilitates the learning by its staff members in order to be able to change continuously and to adjust itself to the needs of a changing environment. The staff should be encouraged to try new ways to perform their task and rewarded if they discover a more effective way, but not punished if this new way is less successful than the old way. It is not only important for the extension agency to learn how they should change, but also to learn how they should not change.

Human Resource Development

It is clear that the way agricultural extension agencies can support agricultural devlopment is changing rapidly. This requires major changes in the competence of the extension agents and in the way this agency is managed. Organization theory nowadays recognises that the success of an organization depends to a large extent on its ability to develop among its staff the competences needed for its survival in a competitive and changing world (Pareek and Rao, 1992).

Antholt (1994), who has considerable experience in supporting agricultural development in South Asia, says that in the early 21st century an agricultural extension agency needs a cadre of professionals who:

1. can work under complex and fluid circumstances with little supervision,
2. can diagnose farmers' problems effectively,
3. are able and willing to listen to and learn from farmers,
4. can communicate effectively and work with farmers and groups of farmers,
5. are able to present options, based on principles of science and good agricultural practices, that widen real choices available to farm families.

There is little doubt that few extension agents in developing countries possess these competencies at this moment. Thus we face a major management problem, if we accept Antholt's analysis as correct. What he says is basically in agreement with our Sections

on 'The Changing Environment of Agricultural Extension Agencies' and 'Role of Extension Agencies in Agricultural Development'. The success of an extension agency depends to a large extent on the comptence and the motivation of its staff. A major task of extension management is to develop among its staff the competencies which are required to be able to perform their future tasks well or to replace the present staff by new staff members, who have these competencies.

Often one sees training courses as the solution for this problem, but the experience is that the impact of these courses on the behaviour of the extension agents and their relationship with their farmers is often limited, unless these courses are a part of a more systematic process of change in the extension agency. Firstly, people learn little from a training course if they are not motivated to learn. Hence, the first step should be to create an awareness among the staff members that a change in their behaviour is necessary. This cannot be realised by ordering people to change. It is much more effective to create a situation in which the staff members discover themselves that change is necessary. Often it helps if an outsider, e.g., a consultant analyses together with the staff how their environment is changing, which role their organization can play in this changed environment and what this implies for the task of each staff member. We have to admit, however, that it is much easier to organise such a process of change in a small agency than in a public extension service with over 10,000 staff members. More research is needed on effective ways to change these large organizations.

Secondly, the behaviour of the staff members of extension agencies is not only influenced by the courses they have followed. The expectations of their behaviour from their environment, expecially their superiors, has much more impact. This implies that it has little impact to send individual staff members to a course unless these expectations of their environment change at the same time, especially the expectation of their direct superiors. It should be clear to them which changes the training course tries to introduce, why it tries to do so and what impact this can have on the way different staff members work together as a team in the organization. Hence, the training programme should be a part of an integrated process of organizational change, which includes people working at different levels in the organization. Only in this case one

can expect that the superiors will support that their staff members think about how they can utilise the new ideas they have learned in the training course to improve their work.

Often it will be necessary to change the system of rewards and punishment for the extension staff. For instance in order to develop location-specific solutions for farmers' problems they should analyse together with the farmers what these problems are, what has caused these problems and engage in a collaborative, creative process to develop solutions for these problems. This cannot be realized in a manageent system in which the staff members are rewarded for implementing the orders of their superiors, but creativity should be rewarded. The managers should realize that in testing whether the new ideas learned in the course, one will discover that some of them do not work well. The trainees should not be punished for making this discovery as was done in the past when management was based to a large extent on punishment of staff members who made a mistake rather than on rewarding a staff member who developed a good new idea.

The implementation of the knowledge and skills in a course on developing location-specific solutions for farmers' problems will often require a deconcentration in the power to make decisions. If decisions on extension meassages are made at the national level, it will not be possible for an extension agent to teach his farmers these sloutions. This is only possible if he can make his own decisions on extension messages or if these decisions are made for an area with a more or less uniform socio-economic and agro-ecological situation. This may require a body at block level where extension agents, researchers and preferably also farmers' representatives to make decisions on extension messages (Chowdhury and Gillon, 1996: 26).

In order to increase the competence of the extension staff, one thinks in my experience to often of training courses and not enough of stimulating self-directed learning processes (Martwanna and Chamala, 1991). A good extension agent realizes that he lacks some of the competencies which are needed to help his farmers to grasp the new opportunities which develop through changes in markets and new research findings. He realizes that he is not well able to answer some of the questions farmers ask or may ask,

whereas good answers to these questions would be quite important to help them to develop their farms. This makes him eager to learn these answers. It is an imprtant task of extension managers to support this learning process. This is not only possible by sending these extension agents to a relevant course, but also by providing him with literature on this subject, by giving him the opportunity to discuss his questions with SMSs, researchers or farmers, who have already experience with these changes. These learning processes for which the need originates from the experiences and creativity of the extension agent can have much more impact than the participation in a course to which he was sent by his superior or which he is allowed to attend as a reward for a job well done. With Bennis (1989: 6) I am convinced that "adults learn best when they take charge of their own learning."

An extension manager can help to arouse the need to learn new ideas and new skills among his staff by asking an extension agent during the supervision of his work what would be the best way to solve a problem he is facing. It can also help to discuss in staff meetings realistic cases of new problems extension agents are facing in their work.

We discussed in Section on 'The Changing Environment of Agricultural Extension Agencies' that at present blanket recommendations often have to be replaced by location-specific solutions for farmers' problems. The ability to develop these solutions cannot be developed by sending all extension agents to the same course. They should have the opportunity to develop the knowledge which is needed in the location where they work.

Bennis (1989: 45/6) makes in interesting distinction between the education of a leader and the training of a manager:

EDUCATION	TRAINING
tentative	firm
dynamic	static
understanding	memorizing
ideas	facts
broad	narrow
deep	surface
experiential learning	rote learning
active	passive

questions	answers
process	content
strategy	tactics
alternatives	goal
exploration	prediction
discovery	dogma
active	reactive
initiative	direction
long-term	short-term
change	stability
content	form
flexible	rigid
risk	rules
synthesis	thesis
open	closed
imagination	common sense
LEADER	MANAGER

In the present rapidly changing Asian societies agricultural extension agencies need not only managers, but in the first place leaders, who can guide these agencies towards a new role for which there is need in the next decade. How does their experience in schools and universities and by working in extension agencies prepare people to become leaders? Is creativity and flexibility rewarded? How can a manager develop himself to become a leader? Does his/her agency encourage to become a leader who guides the agency in new directions?

Processes of Change

The processes of change discussed in this chapter are threatening to many staff members of extension agencies. They are afraid that they might loose their job, their competence is no longer needed and/or the good work they have done is not recognized. Let us take for instance a government extension agent who has done good work to recommend farmers which pesticides they should use to reduce damage from plant diseases. Now he is told that farmers should learn themselves in farmer field schools how they can use IPM to prevent this damage and that farmers can act as trainers in these schools. Can you blame our extension agent if he tries to prevent that this change in policy is realized? What would you do as an

extension agent, if your low salary used to be supplemented by commissions from pesticide dealers for the pesticides sold in your area?

It is not possible to eliminate this resistance to change, but extension managers can reduce it. They can involve their staff in the analysis of the changes in their environment and in discovering new opportunities these changes offer inside or outside the extension agency.

It also makes a difference if the staff members are supported by their organization to prepare them for thier new task. This can be by training them for a different job or by helping them to find a suitable job outside the extension agency. Some countries have the rule that a government officer cannot be dismissed unless he has committed a crime. In European countries we had to make it easier to dismiss government officers, because we are not able to pay the salaries for officers who are no longer needed because the society had changed. In the present dynamic world, a country where the government does not like to change itself in order to serve the changing needs of its people as good as possible, will have difficulties to compete with other countries.

It is clear that the ideas presented above on the way agricultural extension agencies can best support agricultural development deviate considerably from the way most extension agencies operate at this moment. It is completely impossible to realize these ideas overnight. One can only move gradually in this direction, but I am conviced that the country which succeeds in doing so most rapidly will have a distinctive advantage in the increasingly competitive world market. Farmers, who do not receive the kind of support from extension they need, will have difficulties to compete. An important task of extension managers will be to analyse together with its staff, representatives of the farmers and other actors in the AKIS how their environment is changing, how this makes it necessary to change their extension agency and to realize these changes as soon as possible. This may require a delegation of decision making in the extension agency. At this moment many managers are so busy with minor decisions that they have little time to think about these major decisions in a systematic way.

Many extension agencies have a Memorandum of Understanding how they will cooperate with other agencies, e.g., with research institutes or with the district government. Often this strengthens the cooperation with these agencies. But this can also make it more difficult for the extension agency to adjust to the requirements of their changing environment. If the extension agency decides to perform the roles which are likely most needed in their environment in the near future, they may no longer fulfil what they promised to do in the Memorandum of Understanding. Flexibility is needed in these memoranda. The extension agency should discuss with its partners why and how it considers change desirable. Preferably this discussion should be based on a joint analysis of the changing environment.

Conclusion

In the present dynamic time nearly everything is changing rapidly including the process of agricultural development and the role extension agencies can play to support this development. In Asia the demand for agricultural products is raising more rapidly than in recent decades as a result of rising incomes. At the same time it is difficult to maintain the present rate of growth in agricultural production, because many of the present farming systems are not sustainable. It seems that we need much more location-specific solutions for farming problems which have to be developed by farmers, extension agents and researchers working together as a team. This will be most needed in the rainfed areas, where we find also most poverty.

In this situation it becomes less the task of the extension agencies to transfer technologies developed at the research institutes to the farmers. But more to increase their capability to participate in the development of better farming methods, to learn from each other and to help the farmers to make a choice out of the baskets of options available to them. This basket does not only contain more productive and at the same time sustainable technologies, but especially new farming systems which the changing markets made possible. Thiese markets change not only because of increased prosperity of a part of the population, but also because of trade liberalization. This liberalization causes at the same time more competition which allows only the more efficient farmers to continue to make a living from agriculture.

In the past public extension agencies had more or less a monopoly in extension, but at present farmers can also use many other sources of information to obtain the new knowledge they need for their decision making. Not only farmers have to compete for their survival, but also extension agencies. They will only be able to survive if they change themselves. Their changing environment is a threat for these agencies, but offers at the same time, opportunities to perform new roles for which there is a need among the farmers and in the society as a whole or to perform old roles in a new way. To grasp these opportunities requires a dynamic extension agency which learns more rapidly and/or better than its competitors how the environment is changing and what possibilities there are to provide the farmers better with the information they need than in the past. This implies that agricultural extension agencies should become learning organizations, which learn from their experience how they can improve themselves. This requires a major change in the culture of many agricultural extension agencies. For creative people this offers challenging opportunities to make an important contribution to agricultural development by helping these agencies to change. In a time of drastic change, it is the learners who inherit the future. The learned find themselves equipped to live in a world that no loger exists (Hoffer in Bennis, 1989: 189).

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