

## **ROLE OF AGRICULTURAL EXTENSION IN ALLEVIATION OF RURAL POVERTY**

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### **Introduction**

An important policy goal of many governments is to contribute to the realization of the Millennium Development Goals, especially Goal 1: Eradicate extreme poverty and hunger; Halve between 1990 and 2015 the proportion of people whose income is less than one dollar a day (Sachs, 2005). The experience so far does not make it likely that we will realize this goal. Three out of four of these poor people in developing countries live in rural areas. Most depend on agriculture for their livelihood. In China the number of rural poor people is decreasing rapidly, but this not yet the case in South Asia (World Bank, 2007: 3, 26).. Therefore agricultural development and agricultural extension have an important role to play in the realization of this goal.

One reason that many of these people are poor is that the Index of world market prices for agricultural commodities decreased between 1960 and 2000 with about 60% (FAO 2002:12). At the same time with the rapid economic growth in most developing countries many urban people could increase their income and rural people no longer accept that they have to live in poverty. The governments of China, India and several other countries realize that the growing gap in income between the rural poor and the urban rich is a serious threat for the social stability and civil order of their country. A growing number of publications discuss how the poverty among rural people can be decreased: World Development Report 2008, IFAD 2001, Christoplos and Farrington, 2005, Sanchez and Swaminathan, 2005. This paper gives a brief overview of these ideas.

Anderson (2007) has given a good overview of the experiences in different developing countries with changing the organization of the financing and delivering agricultural extension. Since 2005 there has been a major change in the development of the prices of agricultural products. Between April 2007 and 22-04-2008 the Economist food price index increased with 69%, whereas this price index for industrials increased with only 1.6%. This causes serious problems in the low income food importing countries, but it may also be a reason to make more investments in agricultural growth. During the seminar a serious discussion is needed on the impact of the rapid change in the world market prices of agricultural commodities on the farm gate prices in India and on the decisions farmers and agri-business firms in this country make.

During the past 60 years I have seen in the Netherlands a rapid growth in the value of agricultural production together with a large decrease in the number of people working in agriculture. I will give a brief description of this change in order to make it possible to discuss what India can learn from this experience. It will not be possible to copy this experience in India, because there is a large difference in the situation.

## **Rural Poverty**

The IFAD (2001 : 16) estimates that 75 per cent of the people who survive on less than one dollar a day live in rural areas. One reason that they are poor is that the supply of agricultural products increased more than demand, e.g. in the green revolution and as a consequence the prices decreased. As a result many local governments and many donors have decreased their investments in agricultural research and extension and for irrigation, rural roads and the infrastructure needed for agricultural development. E.g. in 1980 of the annual World Bank lending 30% went for agricultural projects, but in 2007 this had decreased to 12%. Many policy makers now start to realize that this was a wrong decision (World Bank, 2008). However, it may take time until increased budgets for agricultural development result in increased food production. E.g. a larger budget for agricultural research may make it possible to develop valuable improved production technologies, but it will take time until these are adopted by many farmers. In China and India the spending on agricultural research and development increased threefold between 1981 and 2000 (Pardey et al., 2007:47). This is partly because with economic growth also the salaries of researchers increased.

According the World Development Report 2008, the percentage of the population living on less than one dollar a day during 2002 was 34 per cent in India, 7 Per cent in China, 41 per cent in Bangladesh, 7 per cent in Indonesia and 6 per cent in Sri Lanka.

In Vietnam this percentage decreased between 1990 and 2004 from 52 to 9%. This makes it likely that a further decrease can also be realized in India.

The rural poor do not get their income only from agriculture but also some 30% from non-farm sources. Increasing the income from these sources is often easier than from agricultural production.

### **Possibilities to increase the income of poor farmers include:**

1. Increasing the production per ha of land and per animal by using improved technologies. The cereal yield was 2417 kgs / ha in India, 5095 kgs / ha in China, 3535 kgs / ha in Bangladesh, 2456 kgs / ha in Pakistan, and 4278 kgs / ha in Indonesia and 4641 kgs / ha in Vietnam (World Bank, 2007). It indicates that there is a possibility for a further increase in yield through improved technologies and more effective use of irrigation water in India.

Increasing this yield does not only requires improvements in the production technology, but also in the input supply and marketing system (Swanson, 2006, Hall et al., 2004).

2. For the alleviation of rural poverty increasing the added value per worker in agriculture is more important than increasing the yields per ha. There is a very large potential to increase this value in India. The World Bank (2007) estimates that this value is in Malaysia 12 times higher than in India and in some industrial countries even over 100 times higher. There are two ways to increase this value per worker. One is switching to the production of high value products for which the demand with the economic growth in India and in many other countries. E.g. the consumption of milk per capita increased in India between 1977 and 1999 with some 80% (World Bank, 2005: 25). This implies that extension services should not only advice farmers on production technologies, but also on market developments. This is only possible if they get information on the expected developments in the markets from agricultural research or from commercial companies.

The other way is to find non-farm employment for many people who are now working in agriculture. Many farmers realize that it can be an effective way to increase their family income if either they themselves or their children find a non-farm job. For many Indian farmers a major goal in their life is to enable their children to find a job outside agriculture in the hope that they will earn there enough to support their parents and other relatives who continue to life on a farm. They need information on what kind of education and skills are needed to be able to compete successfully in this labour market, on developments in this market, on the way to combine farm and non-farm sources of income and on the implications for the welfare of their family if some or all members find a job outside their village. The older people expected that their children would take care for them at their old age, but can this be realized if some of them migrate to a city? If I see the rate of urban development in e.g. Hyderabad, I am convinced that there are good employment opportunities for a well trained mason, electrician or other worker in the building industry. Where is this kind of training available? Also tourism offers employment opportunities in rural areas. For farmers as well as for the society as a whole it is more important that extension helps farmers with decisions regarding non-farm sources of income than with decisions on the optimal amount fertilizers for a cereal crop, but unfortunately there are few extension organizations which help their farmers with the first kind of decisions. To be able to give this help extension agents need a different kind of training and a different kind of support from research than they get at this moment.

3. At this moment usually only a small proportion of the money consumers pay for farm products reaches the farmers. This is partly because farmers have less power in the markets than traders or other actors. But it can also be because the value chain from the producers to the consumers is not organized in an efficient way. The interest in these value chains is increasing in the marketing literature, but not many extension agents are well enough informed about this development to be able to help their farmers to organize these value chain in a more efficient way. e. g. with the help of their farmers' organizations. In agricultural universities extension agents should not only be trained in production technologies, but also in marketing. Some commercial companies help to fill this gap, e.g. by teaching some people in Indian villages how they can decide what is the right moment to sell their soybeans by checking on the Internet what are the future prices for these

### *Lead Papers*

beans on the market in Chicago (Prahalad (2005: Ch. 6). In this era a successful farmer is an agricultural entrepreneur who is not only trained in production technologies, but also in marketing.

One role of a successful entrepreneur is to discover new opportunities in the market earlier than his competitors. Which extension agents are able to train farmers to perform this role successfully?

4. Increasing the power of farmers is not only important in the markets, but also elsewhere in the society. Through their organizations they can also increase their influence on government policies, in water users' organizations and all kind of other organizations. Therefore some extension agents should be able to help farmers to build successful organizations and develop other kinds of social capital (Dasgupta and Serageldin, 2000).

5. Increasingly environmental problems and climate change endanger agricultural development in India and not seldom poor farmers are most in danger, e.g. because they have less access to irrigation water than powerful farmers. In the past extension services helped farmers to make their individual decisions, but these environmental problems require collective decision making. This is an example of a point stressed by Rasheed Sulaiman at the Centre for Research of Innovation and Science Policy (CRISP) who claims that in the present era extension officers need competencies in a wider range of social sciences than are usual taught at agricultural universities. (Sulaiman and Hall, 2002). A wide range of topics to which agricultural extension should given attention in the present era are discussed in "The synthesis report of the international assessment of Agricultural Knowledge, Science and Technology for development" (IAASTD, 2008). Unfortunately this report gives little attention to the possibilities and the need to increase labour productivity in agriculture.

Some Indians, who migrated to the USA and reached there a top level position in the social sciences, are in my opinion a valuable source of the information which now needed by Indian extension officers. A good example is the communication scientist Arvind Singhal, who wrote with Everett Rogers the book *Combating AIDS; Communication Strategies in Action*. Sage, New Delhi, 2006. It shows how communication research can help to design effective communication strategies. His methodology can not only be used in the health field, but also in agricultural extension. An other example is the work of the famous Professor of Corporate Strategy and International Business at the University of Michigan, C.K. Prahalad, (2005). One of his points is that there are more poor than rich people and that it therefore can be profitable for a company to market products which meet the needs of these poor people. E.g. some multinational companies sold in rich countries washing powder for use in washing machines and than marketed the same product in India. An Indian competitor realized that most families in his country do not have a washing machine, but wash their clothes in a stream or a well. Therefore he designed a washing powder which works well in this situation and sold it in the small quantities poor people can afford to buy. In this way they got a much larger share of the market than the multinational companies. This same principle may also be applicable for extension on biotechnology. There is the possibility to use these methods for developing

valuable bio-technologies on condition that one realizes that Indian farmers need different kind of technologies than US farmers.

6. It is well known that farmers get most of the information they need to make for decision making from other farmers (Van den Ban and Hawkins, 1998), but rich farmers may have access to information from other people than poor farmers. Rich Punjabi farmers may get a good deal of this information from friends and relatives in Western countries, e.g. information they need to predict with developments they can expect in the markets. Poor farmers in a remote village used to have mainly access to information from people of their own caste in their own village. However this is changing as a result of developments in information technologies, which makes it now possible to receive this information not only through face to face communication, but also through the Internet and mobile telephones. I would like to see more research on how extension organizations can increase their effectiveness by making use of these developments in communication technologies.

7. There are large differences in income among farmers depending mainly on their ability to compete with other farmers in their own country and elsewhere in the world. This ability depends mainly on their competence as an agricultural entrepreneur. In many countries this competence is taught in vocational agricultural schools to youngsters, who like to become a farmer. In India many students visit agricultural universities and in some of these universities they get a good education, but this education is preparing them more for work in government agencies than for becoming a farmer themselves. This makes it difficult for Indian farmers to compete with farmers in other countries who trained at a vocational agricultural school to become a successful entrepreneur. That requires at the one hand skills to grow a good crop and on the other hand the ability to profit from the opportunities in the market. With the present high rate of economic growth these opportunities are changing rapidly.

In India the KVKs are expected to provide farmers with the competencies they need to be able to compete with farmers in other Asian countries, but I doubt whether they are really able to do this in the present institutional structure. I was asked to analyze the performance of the KVK in Agra district. If we assume that all farm families in this district should have one member who has followed a course of one week at this KVK in order to obtain the necessary competencies, that the number of farm families would not change nor the number of participants in KVK courses than it would take some 300 years until this goal has been reached. In many other Asian countries one is not satisfied with a course of one week, but thinks that a course of at least one year is desirable (van den Ban, Samanta, Chandre Gowda (2002).

8. With the large differences in income among farmers it is quite important that extension agents learn from successful farmers how they were able to earn a good income on their farm. That information may be at least as valuable for their farmers as the information researchers can provide about their research findings. Probably information on how some poor farmers could increase their income, is most important. A well designed system to collect and spread information on these experiences, can play a very important role in poverty alleviation among farmers.

## Lead Papers

9. For successful agricultural innovation it is not only necessary to develop and transfer new production technologies. Often also changes are needed in the systems of seed multiplication, input supply, post-harvest technology, marketing, human resource development and perhaps in the legal rules. How to integrate these changes in the whole innovation system is a challenge (Hall, 2004).

10. The Indian society is changing very rapidly. Therefore also extension services should change in order to remain relevant in a different environment. Sulaiman and Hall (2004) have presented in my opinion very valuable idea on which changes are needed. They propose changes as:

<i>from</i>	<i>to</i>
technology dissemination	supporting rural livelihoods
improving farm productivity	improving farm and non-farm income
forming farmers groups	building independent farmer operated organizations
providing services	enabling farmers to access services from other agencies
centrally generated innovations	innovations evolved form local experimentation

In short they see a need to develop innovation systems in which partnerships are developed between different actors to learn from their own and each others experience.

### **Changing food prices**

Prices of agricultural products are now raising rapidly in many countries (The Economist 17-5-2008: 109). Reasons are an increased demand for these products as a result of:

(i) Increased prosperity mainly in Asian countries, which many families use for eating nice foods such as animal products, fruits and vegetables,

(ii) More cereals are needed to produce these animals products,

(iii) Cereals are used for the production of biofuels, not seldom with government subsidies. I doubt whether biofuels are a solution for our future energy problems.

(iv) Green revolution technologies made it possible to increase yields, but in recent years these yields have not grown much further; partly because of lack of water.

Also as a result of environmental problems the production of many agricultural products has decreased, e.g. droughts in Australia have decreased the cereal production a lot. In several countries the government subsidies for agricultural products have decreased.

The prices of many agricultural products differ a lot between countries and they have become very volatile; it is very difficult for a farmer to predict what the prices of different products will be at harvest time. Also for me now I am writing this paper in May 2008, it is difficult to predict what the prices will be next September and how changes in prices will influence the decisions farmers and commercial companies make.

These changes in food prices have implications for poverty. Consumers who buy some of their food, have to spend more money on food which they usually can not pay from increased wages. This is also true for some farm families. Several governments get worried about the consequences of these changes in their own country and in other countries. The Secretary-General of the United Nations is worried that many people in poor countries will not be able to get enough food. This endangers the social stability in the world. The World Bank (2008) tries to help governments of developing countries to choose the right policy options to increase food supply.

Other farm families have been able to increase their income by selling their products for a higher price than last year. Sometimes also the costs of production have increased, e.g. as a result of higher prices for their inputs, perhaps as a result of higher oil prices.

For farmers it may become profitable to use more inputs than they used in the past, because that can result in higher yields of their products, but not if the profit goes to traders rather than to farmers. If many farmers use more inputs and as a result food production increases, prices may decrease again, but researchers expect that food prices will continue to increase for quite some time (Rosengrant et al., 2007). The consequences of the rapid change in food prices should be an important point of discussion during the seminar.

For farmers it has become more important to take the right management decisions, e.g. decisions which products to produce and when and where to sell these products. For extension organizations it has become more difficult to provide their farmers with the advice they need for their management decisions. Which role should the extension organization play in reducing environmental problems, such as global warming?

In this uncertain situation the management of an extension organization becomes more difficult. What kinds of help will farmers need a few years from now? How can one select and train staff members who are able to provide this help? With which actors in the Agricultural Knowledge and Information System should the extension organization develop a partnership?

## **Changes in agricultural development in the Netherlands**

In 1947 19% of the Dutch labour force worked in agriculture. This has decreased to less than 3% in 2008. This was combined with increase in the value of agricultural production of which a large part is exported. Therefore the proportion of the labour force working in agricultural is higher in the Netherlands than in many other industrial countries. The basic structure of Dutch agriculture is importing cheap products as cereals and animal feeds and exporting expensive products as horticultural and animal products. In this way this country, which has about the same size as Haryana, became one of the three largest exporters of agricultural products in the world. Fifty years ago about 10% of the value of Dutch agricultural production was produced in horticulture, but this has now increased to about 40%. This was possible as a result of the globalisation of the trade in agricultural products, partly as a result of the development of the European Union and the increased demand for high value products as a result of increased prosperity. Another reason was that the efficiency of Dutch agricultural production and of the organization of agricultural trade made it possible to compete with farmers in other countries (Douw and Post, 2000). This ability to compete was based on:

- (i) a high level of education of the farmers. Some 80% of them have visited a vocational agricultural school,
- (ii) the support they got from agricultural extension and research,
- (iii) the social capital they built in their farmers' organizations and cooperatives,
- (iv) the support they got from a well organized input supply and marketing system.

Farming requires a high level of investment. In the Netherlands these investments are higher than in many other countries, because with our high density of population the land prices are quite high. 30000 \$ per ha is no exception. A farmer with a high level of competence will be able to increase the value of his farms, but the experience is that it is also possible to loose a lot of money if one is not a successful entrepreneur. The farmer will try to hand over the farm to those children who he expects that will become a successful entrepreneur. Therefore many of these children are now trained at a 4 year vocational agricultural school and will continue to follow courses on new developments in agriculture after they have finished this school.

Let me give an example. The average Dutch dairy cow gives nearly 8000 kgs of milk a year, but she is only willing to do this if she gets the right kind and quantity of feed. Therefore in agricultural schools students are taught what is the feed cows with different production levels need and how the farmer can program his computer in such a way that each cow gets not less and not more than what she needs. It is also important that the farmer uses the right kind of semen to get cows with a high level of production. With the rapid development of knowledge about DNA the knowledge which kind of semen this is has developed in recent years. So the farmer may follow a course on this issue to keep up-to-date with these changes.



With the rapid change in the society and agricultural technologies life long learning is necessary for farmers. In the Netherlands this is often done through a study club, especially in horticulture. This is a group of horticulturists with about the same type of farming system, who meet regularly on the holding of one of their members to discuss the way this farm is managed. They compare the way the crop there is growing with the same crop on their own holding and discuss what may be the causes of the differences. Often they invite the local extension officer for this farming system to participate in the discussion. They may also discuss whether collective marketing of their product will be more profitable than selling the crop individually on the auction. This can be profitable because together they can provide the buyer with the product with the specifications, the timing and the quantity he requires. The study club may also cooperate with a researcher for on-farm trials on their farms or ask a researcher to discuss new research findings in their meeting. The Punjab Agricultural University cooperates in a somewhat similar way with groups of larger farmers in their State.

It is well known that as the per capita income of a country increases the proportion of the labour force which can find employment in agriculture decreases (World Bank, 2007). Fifty years ago when their per capita incomes in the Netherlands were growing at a rate of about 4% a year, I was asked by the extension officers of a farmers union to give a lecture for 1000 farmers, farm women and farm youth about the reasons why people working in agriculture earn less than people outside agriculture. They knew that my answer would be: Because there are too many people working in agriculture. This was a message which farmers did not like to hear, but the extension officers were convinced that many of their farmers would come in difficulties, because they did not prepare themselves for the rapid changes in their society, which required looking for non-farm employment for most of their children. These changes would not make it possible for many farmers and for a lot of their children to earn an income of a similar level as people outside agriculture were earning. Therefore they considered it as an important task of extension to help farmers to decide how they can give their children an education which would enable them to find a good job outside agriculture. Also the farmers should decide who would take care for the parents at old age if none of their children would take over the farm. This kind of extension work has been very important for welfare of many Dutch families. I would be happy if you can tell me who helps Indian farm families with similar decisions they have to make in order to adjust themselves to the rapid changes in the Indian society.

In India these changes may be more difficult than they were in the Netherlands, because your rate of economic growth is now much higher than it has ever been in our country. Perhaps you can see your future in South Korea, where the rapid economic growth started earlier. There in 2000 51% of the farm operators were over 60 years old and only 6% were less than 40 years (van den Ban, 2004). Preparing farmers to live in a society which is very different from the society in which they are raised, is a very different task from transferring modern production technologies to them. Are your extension officers prepared for this new task?

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In the Netherlands farmers had to increase the size of their farm in order to maintain it as a viable unit. For instance in the Province of North-Brabant, a province which used to have many poor farmers, the average number of dairy cows per farm increased from 7 in 1960 till 47 in 1985. The necessary investments for this enlargement could only be realized by families who were willing to live in a frugal way. That means that they had to live in a poor way, but their family was rich at the moment they died as also the value of the land per ha increased.

With the increasing prosperity in many European countries and with the globalisation of the markets the opportunities increased to earn money from high value products as flowers, vegetables and pigs. Often small farmers have made better use of these opportunities than the large cereal farmers. One reason was that in the past these cereal farmers had a higher status in the society than producers of vegetables, whereas now a good vegetable farmer can earn more than a cereal farmer on a much smaller farm. These status considerations made it difficult for many farmers to profit from the new market opportunities. Can we expect something similar in India?

### **Concluding remarks**

Agricultural extension plays an important role in the alleviation of rural poverty. Often the rate of return to investments in agricultural research and extension is considerable higher than return to other investments in agricultural development (Anderson, 2007: 22). However, to realize successful rural development it is not only important to develop and transfer improved agricultural production technologies, but also attention should be given to other elements of the innovation system, such as profiting from new opportunities in the markets and partnership between government agencies and private enterprise (World Bank, 2007a). Also not only attention should be given to possibilities to earn a better income from agriculture, but for many rural people there are more opportunities to earn a good income outside agriculture on condition that they acquire the skills which are needed there.

I hope that it will be clear that it should be the farm families and not the extension organizations or other government agencies who should decide what is the best way to reduce their poverty. All solutions involve risks and have important social consequences. Therefore only the families themselves can decide what is the best solution in their situation.

In this paper I did not discuss some important aspects of rural poverty. It is clear that in the Indian situation there is a strong relationship between caste and poverty. I realize that in Indian villages it is often clear difference in the livelihood of poor low caste farmers and of high caste families. However, there will be many participants in this seminar who are more competent than I am to discuss how the social position of different castes and tribes influence the way they can reduce their poverty. Let us use their competence during the discussions in this seminar.

The agricultural price policies of different governments have important implications for the poverty among rural people, but extension agents have limited opportunities to influence these policies and I was asked to talk about the roles of extension organizations.

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