Changes in Society Require Changes in Agricultural Extension: Some Observations

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Our society is changing rapidly, especially in many Asian countries with fast growth in productivity. This is partly caused by changes in agriculture, but changes in society are also a reason why agriculture is changing. These changes make it necessary to change agricultural extension. This article discusses these processes of change. It is based on observing agricultural development during the past 60 years in the Netherlands, since 1966 in India and more recently in many other countries. Quite valuable for me was the opportunity the South Korean Rural Development Administration offered me recently to see the very rapid changes in their country. The objective of this article is to help the readers to think in a systematic way about the changes which are desirable in agricultural extension in their country.

Increase in income

In several Asian countries, income per capita increases more rapidly than it has ever done in Europe. This has important consequences for the development of agriculture. Incomes can increase because of increase in labour productivity, also in agriculture, but the demand for agricultural products will increase less than the demand for electronic products or tourism. Hence, the employment in agriculture decreases (Clark, 1957). For young and well educated people, working in agriculture, it is easier to find employment elsewhere than for older people. Therefore, the age distribution among farmers changes. In South Korea, a country with a rapid economic growth during the last 40 years, in 2000, 51% of the farm operators were over 60 years and only 6% less than 40 years (Lee and Lim, 2004). It means that in the next 10 years, about half of the farmers will stop farming and very few of them have a successor, who will take over the farm. Not many of the farmers between 50 and 60 years will be interested to buy or rent their farm, because they will also stop farming soon and receive an old age pension when they become 65. A lot of land and market share becomes available for those farmers under 40 years, who can raise the capital and are willing to take the risk to make the investment needed to expand their farm. We can expect a large increase in farm size, but fields with a size and shape, that are difficult to mechanise may

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no longer be used for agricultural production. In this situation, management decisions are crucial for the success in farming.

In countries which started later than South Korea with a rapid economic growth as China, India and Vietnam, we may expect a similar development in the years to come. With the one child policy even less youngsters may enter agriculture in China than in Korea.

Another consequence of the increase in income is a growth in the demand for high value agricultural products as vegetables, flowers and animal products. This can be domestically, as well as, in foreign countries. Competing for these products requires a high level competence of the producers. This is a reason for farmers to become more specialised. They can not be more competent than their competitors in all branches of agriculture.

It is well known that computers decrease rapidly in price, because now more knowledge is used for their production and programming than 10 years ago. Also, in agriculture, product prices decrease, because production efficiency increases as farmers now use more knowledge than they did in the past. The World Bank estimates that between 1980 and 2000, the prices of agricultural products decreased with about 50% (FAO, 2002:12). Therefore, farmers could only maintain their level of income, if their productivity increased. It is not known what will happen with these prices in the coming years. At the one hand, one can expect that productivity in agriculture will continue to increase, because here also more knowledge from research and experience becomes available and farmers get more access to farm machinery, new varieties and chemicals. At the other hand, in some countries with the migration out of agriculture, the production may increase less than the demand which grows as a result of population growth and increased prosperity. We can be rather sure that only those farmers who increase their productivity more than their competitors inside and outside their country, will be able to maintain their income, but also among them many will not be able to increase their income as rapidly as the urban population in their country. Their income aspirations will increase when they see other people increase in income and level of living. I am convinced that some good entrepreneurs will be able to earn a good income from farming. A few years ago, I visited a medium sized farmer in the mountains in the North of India. This farmer was growing good quality kiwi and other fruits and was very well able to market these products. The Director of Extension of the nearby horticultural university, who brought me there, estimated, that this farmer earned 15 times as much as an assistant professor in his University. However, the market does not allow many farmers to earn such an income.
Globalisation and farmers' organisations

Through globalisation, farmers have to compete increasingly with farmers all over the world. In many countries, government protected their farmers by restricting imports from other countries, but the WTO treaty makes it necessary to change these policies. Also, the decrease in costs of transport and Information and Communication Technology makes it easier for a trader to get information where good quality products are available for a low price.

There is a major change in the trade in agricultural products. In the past, many farmers sold their products directly to consumers or to small traders, who sold it to consumers in nearby towns. Now, they often sell to multi-national companies as Cargill and to supermarket chains. These supermarkets like to advertise nationally which products they offer for sale at which price. They need therefore large quantities of products of a standardised quality. Often they decide which variety the farmer should grow, which cultivation practices he should follow and which quantity he can sell at which time. It is easier for large farmers than for small farmers to meet these conditions, but local traders or farmers groups can also sell the quality and quantity of products the supermarket needs. This can be done through contract farming, but it is no exception that the conditions in the contract are more profitable for the trading company than for small farmers. What farmers' organizations can do to prevent this is well discussed by Stessens and Gouet (2004). It is important that agricultural extension officers understand how the market structure changes. A team of researchers from different countries are studying these changes at this moment. Their findings are available on the website www.regoverningsmarkets.org.

Often large trading companies have their own agricultural research and extension staff. As a result, the field worker of e.g. a canning factory may know better how to produce the kind of pineapples for which there is a good demand in the (export) market than the government village extension agent, who has to give advice on the production of a large number of different crops (Swanson, 2004). The commercial company may also be able to provide information on the differences in the quality preferred in different markets.

This process of globalisation causes threats and opportunities for farmers. Threats, because local consumers of their products may switch to imported products, if these are cheaper or of better quality. Opportunities, because it may enable farmers to produce for export markets. It is my impression that more farmers are worried about these threats than happy with these new opportunities, whereas a good entrepreneur would ensure that he develops the ability to compete with foreign
farmers and develops channels through which he can reach markets in an efficient way. In the Netherlands, less farmers left agriculture than in many other industrial countries, because of the ability of farmers and their organisations to compete with farmers from many other countries. In this way, this small country became one of the largest exporters of agricultural products in the world, but at the same time, a large importer of cereals and other bulk products in which the Dutch farmers can not compete well. Now in the Netherlands only, 8% of the value of agricultural production comes from crops and 40% from horticulture, mainly flowers and vegetables. Vocational agricultural schools, farmers’ cooperatives and other farmers’ organisations played an important role in developing the ability of Dutch farmers to compete in the world market.

With the increasing power of multinational companies in the markets, it becomes more important that farmers do not deal with them as individuals, but through their own organisations (Koopmans, 2004). This can help them to earn a fair share of the price consumers pay for their product. Crucial for the success of these organisations is that they are managed by farmers and not by government officers, and that the leaders among the farmers are well educated and motivated to work in the common interests of all members and not in their private interest.

Through these organisations, farmers can also influence government policies. In many developing countries, urban people have more political power than rural people, because they are better educated and organised.

Farmers’ organizations can also play a useful role by increasing the competence of their members through education and exchange of experiences. This can be education about production technologies, farm management and marketing. These organisations may run agricultural schools, where youngsters are prepared to become competent farmers and offer courses which support lifelong learning. These schools and courses do not only teach production technologies, but increasingly also entrepreneurship (Lans et al., 2004). In a changing society, farmers can only continue to make a living from farming, if they adjust their farming system in time at new developments in the markets. Lans et al. show that farmers do not only learn to become better entrepreneurs by participating in formal training courses. Informal learning is also quite important. That means, learning from observations of the changes in farming systems of successful entrepreneurs and discussing with them why they made these changes and whether or not this had the expected consequences. In India, there is now fortunately a lot of attention to developing entrepreneurship in farm families. The
5,00,000 women Self Help Groups, which were established in the last 10 years time, offer them an opportunity to exchange experiences about how to become better entrepreneurs (Samanta, 2005).

In order to be able to compete, farmers should not only be well informed about findings of agricultural research, which are relevant for their situation, but they should also learn from practical experience. In this regard, study clubs can play a useful role. These are clubs of 10 to 20 farmers, who visit each other’s farm regularly, observe how crops and animals are growing, discuss which practices the farmer has used and learn from their observations which practices are successful. Often, the village extension agent participates in these discussions, because this is also for him/her a way to learn from farmer’s experience and he can reach in this way more farmers than through individual farm visits (Oerlemans et al., 1997). In Asia, this kind of training is widely used in the Farmer Field Schools for Integrated Pest Management (van de Fliert et al., 2002, van den Berg, 2004). Initially, farmers learned in these schools about pest management, but many groups experienced that it is useful to learn also about other cultivation practices.

Discussion groups can also play an important role in farm management extension (Faure and Kleene, 2004). After the group received the basic accounts of one member, they discuss how he/she can increase his/her income or reduce risk, e.g. by changing the cropping pattern. They learn how to make better decisions by analysing a situation similar to their own, calculating the consequences of alternatives and listening to the ideas of their colleagues and the extension agent about these changes.

There are large differences between countries in the opportunities farm families have to send their children to a vocational agricultural school. In India, a small proportion of these youngsters can get a course of one week of a Farm Science Center (KVK) (van den Ban et al., 2002). When walking through farmers’ fields in the Philippines, I am not astonished to meet a young farm lady who after four years high school has visited a two years vocational agricultural school. Insufficient vocational agricultural education makes it difficult for Indian farmers to compete in the world market with farmers from other countries. For a trader in agro-chemicals, it easier to cheat Indian farmers than Filipino farmers. In Indian Agricultural Universities, a large number of students obtain a Bachelors Degree in order to prepare them for a government job, but only for a small proportion of them, such a job is available. I am convinced that if some of the budget which is now used to finance agricultural universities, would be used for vocational agricultural education, Indian farmers would be better off. The quality of education determines the ability of farmers in different countries to compete in the market.
The availability of entrepreneurs in a country is related to the educational system. Education can aim at learning students:

- which solutions for problems are available,
- which methodologies can help to develop new solutions, and
- how to develop new methodologies and motivate students to participate in lifelong learning.

On some agricultural schools, and even universities in Asia, the emphasis is on memorising good solutions for present problems. In our era of rapid change, this is of limited value, because the nature of the problems is changing and many new solutions become available. As a student, I did not learn how to use a computer, but now an extension scientist cannot work effectively without this ability. The rapid change in farming systems and markets makes it also for farmers necessary to continue to learn. They have to become entrepreneurs. Fortunately, the interest is increasing in learning how to think in order to develop new solutions and new research methodologies.

**Changes in agricultural extension in India**

When I first came to India in 1966, the production of High Yielding Varieties of wheat and rice just started. With these varieties, the right use of fertilisers, irrigation and other cultivation practices, a large increase in yield could be realised. Farmers in the irrigated areas were happy, because they realised a large increase in income. The extension agents provided clear recommendations how to grow these new varieties successfully. Also policy makers were happy, as they had been afraid that of the 500 million Indians, soon many millions would die from hunger. Now, there are over a billion Indians and the country produces surpluses of cereals. Some people died from hunger, but not because no food was available, but because they did not have the money to buy enough food. Hunger became a money problem instead of a supply problem (Swanson, 2004). Farmers in the rainfed areas were less happy, because the prices of the grains decreased and they were not in the position to grow the High Yielding Varieties.

In 2004, I was shown a very different successful extension programme in a rainfed area in Karnataka in India. Farmers there used to grow mainly millets and sorghum, but with the decreased cereal prices and increased income aspirations, that did no longer provide them with sufficient income. Therefore, during the dry season, they went to the city to look for unskilled, low-paid jobs. Extension agents from a NGO, BAIF, and the Indian Grassland and Fodder Research Institute offered them another option to increase their income: to collect rain water in pits in their fields, use this for growing fodder crops and different kinds of trees (fruits, fodder, firewood, etc.). For fruits and milk produced in this way, the...
demand was growing in a nearby city, but this required a well organised marketing system. Extension did not give recommendations to farmers what to grow, but discussed with them which consequences they could expect from the different options. Each farmer selected the option which suited his family best, e.g. one farmer was proud that he had well producing dairy cows, whereas his neighbour bought cheap cows, which were in a poor condition, fed them well and sold them at a much higher price. Farmers were quite happy with this extension programme, because it enabled them to earn on their own farm more than they could earn in the city. They preferred this way of life. I consider this as a good example of how one can integrate the knowledge from researchers and extension agents, e.g. on fodder crops which the farmers did not know, with the knowledge of these farmers about their local situation and their goals. Also for the development of a successful marketing system, the knowledge from outsiders and insiders had to be combined.

Next day, I had a discussion with the very capable regional supervisor of this NGO and I said: “I was happy to see the successful extension programme you are conducting in 10 villages. Suppose that you would extend this programme to all 10 000 villages for which your NGO has a responsibility, could it also be successful?” He was convinced that this would result in a major drop in the product prices and the new farming system would no longer be profitable for most farmers. A next point of discussion was that many farmers in this area migrate to cities or educate their children to look for an urban job. These decisions are very important for the welfare of the farm family, much more than decisions on production technologies, e.g. the choice of the best plant variety. So, I asked the NGO supervisor from whom farmers get help in decisions concerning migration. It worried me that he did not know anybody who advises farmers on this topic of decisions, because I agree with Hoffmann and Thomas (2003) that an extension organisation should concentrate its limited resources on supporting those decisions, which are most important for the welfare of the farm family.

Alleviating poverty among farm families

The World Bank (2000/2001) estimates that 1.2 billion persons have to survive of less than one dollar a day and 900 million of them live in families of small farmers and farm labourers. A major goal of rural development policies of most governments and donors is to decrease poverty among these families. This goal can be realised through:

1. Helping these families to increase the yield of their crops per ha and the yields per animal. Often, this will also result in a decrease in the cost of production per unit of product. This is a major goal of many agricultural research and extension organisations. This works well if yields increase in one village,
but if many farmers increase their yields the price of the farm products may decrease. Candler and Kumar (1998) report e.g. that between 1975 and 1993, the volume of milk production in India increased with about 150%, but the real milk price for the producer decreased with 32%. Increasing yields helps to reduce poverty, only if poor farmers increase their yields more than rich farmers. In India, milk yields have increased by crossbreeding the local low producing cows with breeds with a higher production potential. Realising this potential requires good management, e.g. better nutrition. On small farms, this management is usually the responsibility of the farmer’s wife, on large farms of labourers. Farmer’s wives feel more responsible for good management of their cows than labourers. Therefore, poor farmers are often more successful in increasing yields through crossbreeding than rich farmers. It is important to study with which new technologies and farming systems, small farmers can be successful.

2. Changing the farming system by switching from cereals and other bulk products to horticultural or animal products with a higher value. This is possible, if the demand for high value products increases as a result of economic growth in the country or in export markets. It is not unusual that small farmers make better use of these opportunities than large farmers (van den Ban and Bauwens, 1988). The production of these high value products often requires more labour than the production of bulk products and many small farmers have a surplus of labour. It can also be related to social status of different farming systems; initially these labour intensive products often give a low social status. For the production of bulk products, the farmers’ role may be to supervise the labourers, who do the work. The production of these high value products can only be successful if there is a well organised marketing system (Swanson, 2004).

Table 1. Agriculture value added per worker in 1999-2001 and change in this value between 1979-82 and 1999-2001

<table>
<thead>
<tr>
<th>Country</th>
<th>Value</th>
<th>Change</th>
</tr>
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<tbody>
<tr>
<td>Bangladesh</td>
<td>311 $</td>
<td>43 %</td>
</tr>
<tr>
<td>China</td>
<td>334 $</td>
<td>107 %</td>
</tr>
<tr>
<td>India</td>
<td>402 $</td>
<td>49 %</td>
</tr>
<tr>
<td>Indonesia</td>
<td>744 $</td>
<td>23 %</td>
</tr>
<tr>
<td>South Korea</td>
<td>13782 $</td>
<td>266 %</td>
</tr>
<tr>
<td>Pakistan</td>
<td>712 $</td>
<td>71 %</td>
</tr>
<tr>
<td>Philippines</td>
<td>1482 $</td>
<td>3 %</td>
</tr>
<tr>
<td>Thailand</td>
<td>904 $</td>
<td>44 %</td>
</tr>
<tr>
<td>Kenya</td>
<td>216 $</td>
<td>-18 %</td>
</tr>
<tr>
<td>Germany</td>
<td>32814 $</td>
<td>262 %</td>
</tr>
<tr>
<td>France</td>
<td>58177 $</td>
<td>201 %</td>
</tr>
<tr>
<td>Netherlands</td>
<td>58280 $</td>
<td>139 %</td>
</tr>
<tr>
<td>Japan</td>
<td>30828 $</td>
<td>77 %</td>
</tr>
<tr>
<td>USA</td>
<td>50777 $</td>
<td>146 %</td>
</tr>
</tbody>
</table>

Source: World Development Indicators 2003, Table 3.3, World Bank.

3. Increasing labour productivity. Table 1 shows that there are very large differences between countries in added value per
worker in agriculture, as well as, in the rate of change in this value. It means that there is a large potential to increase labour productivity. The World Bank estimates that nearly half of the world population lives in countries where the added value per worker in agriculture is less than 1% of what it is in the countries with the highest labour productivity. A higher added value per worker can be realised by increasing the value of agricultural production, and also by decreasing the number of workers. The demand for food and other agricultural products limits the possibility to increase the value of agricultural production. Much of the increase in labour productivity will therefore, have to be realised by decreasing the number of people working in agriculture. This can be realised, if farm families combine agricultural and non-agricultural sources of income (Ellis, 2000) or if some members of these families find a non-agricultural job. This is relatively easy in a country as South Korea with a high rate of growth in industries and in all kinds of services, but this is not the case in all other Asian countries or it may only be possible in some parts of these countries. A conclusion of an ODI study on the role of extension in reducing rural poverty is: "It is important to look beyond agricultural extension to a more inclusive livelihoods extension" (Farrington et al., 2002, see also Ellis, 2000).

4. Increasing the price of agricultural products by improved marketing or by a change in price policies. A change in price policies requires an increase in the political power of farmers and a decrease in the power of urban consumers.

Most agricultural extension services concentrate on transfer of technologies which can increase yields, but pay little attention the options 2 and 3, whereas these options have more potential for poverty alleviation. One reason is that the agricultural extension staff is well trained in the technologies which are needed to realise option one, but do not have the knowledge of markets and marketing which is crucial for option 2, nor of employment opportunities outside agriculture and of the social consequences of migration to the cities which are important for option 3. A few years ago, I visited e.g. a NGO South of Chennai (=Madras) in India, an area with a rapid growth of industries. Many small farmers worked in the factories and left their wife and children behind in the village to take care of their small farm. Through their wages, those workers earned more cash than they ever got in the village from selling a part of their products. They felt lonely in the city, but when the wages were paid, some women were available to help them to overcome this loneliness at a party. As a result, they could sent very little money back to their family. The NGO helped them to find ways to overcome these social problems. I got the impression that the NGO staff did much more useful
work for the welfare of these poor families than agricultural extension agents, who saw it as their main task to transfer modern production technologies.

One often thinks that capital investments are needed to alleviate poverty. Wolfensohn, the President of the World Bank, does not quite agree with this point of view. He said: "We used to think of capital as the scarce factor in production and of transfer of capital as the key instrument of growth. Knowledge is now as, if not more, important a factor in development, and this trend is to intensify. In the next century, knowledge accumulation and application will drive development processes and will create unprecedented opportunities for growth and poverty reduction. But there are significant risks of increasing inequality between and within nations". (FAO/World Bank, 2000). We are shifting from an industrial to a knowledge-based society, in agriculture also.

Support for decision making that farmers need

It is indeed important that farmers are well informed about new production technologies, which may be profitable in their situation. These technologies are not only developed in government research institution, but increasingly also in commercial companies selling inputs to farmers or marketing their products and by innovative farmers. Extension services should use all available information sources about new technologies (Sulaiman and Hall, 2004). The development of useful new production technologies requires partnerships between research institutes, companies selling inputs or marketing products and farmers (Hall, et al. 2004, Leeuwis with van den Ban, 2004). Unfortunately, in many developing countries these partnerships do not exist or are weak. In a few Indian districts, these partnerships are promoted in a World Bank project on the Agricultural Technology Management Agency. This Agency brings, in its Board, representatives together of the different actors involved in the agricultural development of the district (MANAGE, 1999). In some districts, this works well.

As our discussion shows, farmers do not only make decisions on production technologies, but also on major changes in their farming system, because:

- many farmers will stop farming as they retire or die without having a successor. This makes it possible to enlarge other farms,
- the demand for high value agricultural products increases,
- through the process of globalisation, there are more opportunities for farmers to produce for export markets, but they face also more competition from farmers in other countries,
- the increasing wage level makes it necessary to increase labour productivity on the farm through mechanisation and specialisation
• often farm and non-farm sources of income have to be combined to be able to earn an income, comparable to what people outside agriculture earn. Through increased contacts with the world outside the farm, the income aspirations of farm families are heightened,

• in many farm families some or all members have to decide whether or not they will leave agriculture for a non-farm job.

This implies that farmers do not only need support from extension for decisions on production technologies, but also on these management decisions. Some extension officers told me that they can not give this kind of advice, because they do not know how prices will develop and what the goals of the farm family are, e.g. what is for them the relative importance of a high average income or a low level of risk. They see it as their role to give technical recommendations and not to enhance their ability to make their own management decisions. This was also a problem in the Netherlands when farm management decisions became more important for farmers, because wages were raising. Extension agents were trained in farm management, but not in extension methods. Therefore, they continued to give recommendations as they did in the past when they advised farmers in use of fertilisers, pest control, etc. Many Dutch farmers did not believe that they would reach their goals better by following these recommendations.

In this situation, it would have been better to increase the capability of farmers to make management decisions through counselling and group discussion methods. Extension specialists and social psychologists started to teach extension agents these methods (van den Ban and Hawkins, 1996) using studies as Lewin (1953), Rogers (1962) and Batten (1967).

In the past, a major management task for farmers was how to sell what he had produced, but in the present era it is more important to learn how to produce the kind and quality of products for which there is a demand in the market (Swanson, 2004). This implies that farmers now need support from different information sources than those which were most important in the past.

The rapid development of information and communication technologies (ICTs) offers new opportunities to provide farmers and extension agents with the information they need to make good decisions. This requires that they can find the relevant information in the overload of information on the Internet, can evaluate which information is reliable and which is not and can integrate information from different sources including their own experience and the experience of other farmers. These ICTs do not replace the extension methods used in the past, but supplement them. Hoffmann and Thomas (2003) have shown clearly that although information can play an important role in
problem solving, more is needed to develop good solutions. One reason is that the situation which causes problems, changes continuously. Finding a solution requires intervening in these processes of change in which many different factors interact. It looks e.g. a rather simple problem to select a new variety with support from a data base with information on yields and prices in the market of different varieties. However, the variety which gave the highest yield last year, may not be very resistant to drought and hence risky. Selecting the best variety requires balancing two goals: high average yield and low risk. A role of extension is to increase this problem solving ability. This can be done in a discussion group, but not only through ICT.

Often, farmers are more in need of market information than in information about production technology. Market information is very important for farmers who specialise in high value products. They have to decide which product to choose, when and where to market it and where to obtain the necessary inputs. A lot of valuable information can be found on the Internet. This can also be used to establish new contacts with buyers and suppliers. However, most farmers do not have access to the Internet, because they do not have a computer and a telephone connection. This problem can be reduced through an Internet booth in their village or a nearby town, where somebody who is specialised in the use of computers and in agriculture helps them to find the information they need. We see this developing in India and China (Meera et al., 2004, Zhong Yongling, 2004). In India, thousands of young agricultural graduates are trained for this job. They can get subsidy from the government for the necessary investments in ICT and make a living from selling information for which farmers feel a need. In China those are often government offices which provide this service, but it can also be done by farmers’ associations or companies selling inputs or marketing products. Although, there is a large potential to increase farm income through these ICT services, there is also a danger that this will increase the gap between the rich and the poor. Many poor farmers are old and lack the education needed to make good use of new information on markets and production technologies.

Agricultural development does not only depend on decisions of individual farmers, but also on collective decisions regarding natural resource management, watershed development, soil erosion control, Integrated Pest Management, input supply and marketing. In collective decision making, farmers’ organisations can play an important role. These organisations can also help to increase the power of farmers in the society, e.g. to ensure that the government takes decisions which are in the interest of most farmers. In several European countries, e.g. Denmark and the Netherlands, these organisations have played in the last 150 years a crucial role in agricultural developments.
(Van den Ban, 1997). Therefore, it is important that farmers learn how to establish successful farmers organisations. NGO staff members are usually more competent to teach this than government officers (Farrington, 1997).

**Extension on environmental problems and sustainability**

The present farming systems cause serious environmental problems. In India, e.g. so much irrigation water is used that the ground water table is decreasing rapidly in many parts of the country and there are serious problems with soil salinity. In other areas soil mining is a serious problem; crops take there more minerals off the land, than are replenished by fertilisers or in other ways. In many countries, soil erosion and chemical pollution endanger the future of agriculture. Pollution of agricultural products limits the marketability of these products. These problems can only be tackled by collective decision making by farmers and other stakeholders. Most governments develop rules on environmental issues, but it is not always easy to enforce these rules. In short run, these rules may reduce farm income and may not allow farmers to intensify the use of their land. Hence, it is difficult to convince people that these rules are important for the country and in long run also for their family. In recent years, extension scientists have given much attention to the role agricultural extension can and should play in reducing these environmental problems and in solving conflicts of interests regarding land use (e.g. Leeuwis and Pyburn, 2002). That is a reason for me not to discuss this important issue here.

**Realising changes in extension**

In Asia, societal changes require new agricultural extension approaches. Agricultural extension organisations can not make the necessary contributions to agricultural development by only transferring improved technologies from government research institutes to farmers. With regard to production technologies, much attention has to be given to technologies for high value crops and animals. Many farmers are pretty well informed on technologies for the bulk crops, which they have been growing for generations, but less on technologies for these new high value crops or animals. Teaching farmers to grow these crops and animals on specialised farms requires new knowledge for most extension agents, and may require specialisation in a few crops or animals, e.g. in the production of shrimps or of roses. This specialisation can better be realised in companies selling inputs or marketing products than in government extension services.

It is also important that the farmers get support on the management decisions they have to make on:

- investments,
- increasing labour productivity,
- choice of the most profitable farming system.
• marketing, that implies
• producing the kind and quality of products
to which there is a good demand in the
market,
• finding or developing efficient marketing
channels, and
• increasing their power versus (multinational)
commercial companies.

These decisions can be interrelated. To
support their farmers with these management
and marketing decisions, the extension agents
should be well trained in and have access to
up-to-date knowledge on farm management
and marketing. They also need training in
extension methods which help to enhance the
managerial and entrepreneurial abilities, such
as counselling, group discussions, role
playing and management games. This
requires a change in teaching and research
programme at agricultural universities, both
for teaching pre-service and in-service courses.
In some countries university staff members
do not have enough contacts with field reality
to teach these courses well. Therefore a
change in the reward system for university
staff members may be needed. In European
universities nowadays, the amount of money
a staff member earns from research projects,
training courses or consultancies financed by
private enterprise is an important criterion for
promotion. Staff members, who are able to
earn money for their university in this way,
can also teach courses which prepare students
for successful field work.

These changes in extension strategies
require also a change in the management style
in extension organisations (van den Ban and
Hawkins, 1996). Transfer of technology
approaches asked for a top-down style of
leadership, e.g. in the T and V system.
Developing extension strategies which are
adjusted to the needs of a changing society
and enhance the entrepreneurial and
managerial abilities of farmers, require a
participatory style of leadership in the
extension organisation. However, this change
in management style has not yet been realised
everywhere in Asia.

CONCLUSIONS
Agricultural extension has to change
because:

1. There is an increase in the demand for
agricultural products with a high value with
the growing per capita income in many
countries in access to world markets,

2. Knowledge about production technologies
for these products and markets become
increasingly important for farmers to compete.

3. This results in an increased productivity
in agriculture, and in many countries, in
a decrease in the prices of farm products.
Farmers who increase their productivity less
than their competitors, will either decrease
their income or will have to find a non-farm
source of income,
4. Productivity in agriculture does not only depend on the decisions of individual farmers, but also on the support they get of input supply, marketing and credit companies and cooperatives.

5. Farm income does also depend on government policies and hence, on the power of farmers' organizations to influence these policies.

6. The role of agricultural extension is not only to transfer technologies developed at research institutes, but also
   • technologies developed by commercial companies,
   • technologies and farming systems developed through experimentation by farmers,
   • finding non-farm sources of income,
   • increasing the managerial abilities of farmers.

7. Only experience can teach us which extension approach and system will be most successful in a given situation.

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