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EXPERIENCES ON AGRICULTURAL RESEARCH, LINKAGES

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The article focuses on the linkages between research and extension and how these linkages can be enhanced. based on a study by the World bank in seven countries Indonesia. Japan. Republic of Korea (South Korea). Mexico. Nigeria. Tanzania and Thailand where five forms of research extension linkage were observed. It also discusses the institutional arrangements governing agricultural research extension linkages. the procedures through which farmers' problems are identified and research themes are identified and the administrative levels at which linkages operate. The procedures for linking research systems and extension services management systems are discussed and the key weaknesses of each linkage type. highlighted.

Policy changes. institutional reorganisation. and the strengthening of institutions are required to enhance agricultural research extension linkages in developing countries. Also concerned with alternative means of financing agricultural extension and the ways in which different financial mechanisms may influence the type of extension support offered to farmers. The motives of different organisations for investing in agricultural extension and analyses the implications of alternative funding mechanisms are also examined.

It offers some hypotheses regarding alternative funding mechanisms in relation to the flow of knowledge to. in and from extension organisations: the management of these knowledge flows: the goals of the extension organisation: the choice of extension messages: extension methods and approaches: the target groups: and the management of the extension organisation.

In many countries a pluriform extension system is developing in which different organisations are financed in different ways. Whether or not the privatisation of extension is desirable depends on factors such as labour productivity. the extent to which there are surpluses or shortages in the production of food. and the impact of extension on consumer food prices.

Concepts

The concept of linkage implies the communication and working relationship established between two or more organisations pursuing commonly shared objectives in order to have regular contact and improved productivity.

Havelock (1986) contends that linkage is a term used to indicate that two systems are connected by messages so as to form a greater system. He argues that if the barriers between two systems are permeable enough for messages and responses to flow out of each to the other. then a link has been created between the two. From this viewpoint, agricultural research and extension services are two systems which are linked by information flow and feedback.

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For agrotechnologies to be relevant to local needs, researchers, extension workers and growers must play important roles in identifying research problems, adapting the recommendations to local conditions and providing feedback to researchers about the innovations that have been developed. Effective communication links between researchers and extensionists are vital in the modification of technological recommendations and in initiating further research; such links enable new technologies and management practices to be suited to local ecological conditions. The participation of extension workers in adaptive research trials allows them to become familiar with the technologies they are expected to promote and also helps to ensure that the sociological dimensions of farming are not neglected.

The relationship between key participants in the research- extension linkage system needs to be strengthened. A conceptual schema for the functioning of the linkages, can be conceived as having relational parts which have been grouped into: (a) the formal agricultural knowledge system embracing researchers, extensionists, subject-matter specialists, linkage activities and methods; (b) the client system, i.e. growers (the end users of technologies); and (c) problems affecting the linkage activities.

Depending on the country, linkage activities are usually managed at varying administrative levels national, regional, state and local levels. The agricultural research and extension system identifies farm families as their target and the hub around which researchers and extensionists focus their actions. The constraints which hinder research -extension linkage potentially affect the agricultural output of growers, whereas effective links will allow farmers to enhance their output through the availability of farming innovations.

It is normally assumed that agricultural research and extension organisations are established as instruments for promoting agricultural development, and that effective linkages between these organisations help them to achieve their goal. Since the methods of forging links between research and extension organisations differ from one situation to another and from country to country, this article discusses the five types of agricultural research extension linkages, as found in seven countries: Indonesia, Japan, Republic of Korea, Mexico, Nigeria, Tanzania, and Thailand.
This discussion seeks to answer the following questions: What form of research extension linkage exists in each of the seven countries? How are the procedures for linking research stations with extension centres managed in each country? What are the key weaknesses in the research extension linkage in a given country? How can weak links be strengthened to improve agricultural communication between research and extension organisations in the countries under study?

Diversity

Evidence from seven countries indicates a diversity of agricultural research extension linkage systems prevalent around the world. This diversity is the result of contrasting socio-cultural situations and the different development models adopted by different countries.
The specific formal linkage mechanisms in the various countries studied include:

1. apex management with research, extension and training in the same institution;
2. matrix management i.e. research and extension as *Perspectives on agricultural extension* semi-autonomous bodies under the same ministry; 3. coordinating committees/meetings; 4. communication units or liaison departments; 5. use of a task force; 6. staff exchanges; 7. cooperation between universities' research programmes and extension organisations.

In addition, informal linkage mechanisms based on friendship and mutual interest include the promotion of joint social activities and the use of existing personal ties. Japan's research–extension linkage system offers a range of opportunities for farmers' participation in joint decision-making on research themes at the prefecture level. The strong research–extension linkage in Japan can partly be attributed to the exchange of staff between agricultural research and extension organisations, enabling personnel to work for a specified time in each
other's establishment.

In Indonesia, Nigeria and Korea the research– extension system is such that decision-making power is concentrated at the top, in the hands of national research officers. In order to strengthen the Indonesian linkage system, each province should have its own experiment station; researchers and extension personnel should meet more often; and the AECs should be more actively involved in identifying farmers' problems. It has been recommended that Nigeria should change its agricultural research policy to allow state governments to control agricultural research stations and conduct research appropriate to the distinctive characteristics of each state.

In the Republic of Korea, the placement of research and extension in one institution is commendable but greater devolution of power to PRDA would be desirable. In Tanzania and Thailand, bold institutional reforms will be required to improve the linkages between agricultural research and extension. In Mexico, the gap in status between extension and research needs to be narrowed for greater linkage between the two systems.

These findings show that policy changes, institutional reorganisation, and the strengthening of organisations are required to enhance research extension linkages in developing countries. A theoretical framework through which global agricultural research–extension systems can be analysed in order to highlight specific ways in which research–extension linkages can be improved, has been proposed.

Decision making

What kind of grower decision-making is the extension organisation trying to influence? This might include:

- adoption of technologies;
- management of technologies;
- optimal use of resources by growers;
- change in farming systems;
- changes in the supply of inputs/credit and the marketing of products;

- transfer of the farm to the next generation;
- changing from farming to another occupation;
- collective decision-making on resource use and on the way growersers try to influence government policies

In several developing countries, e.g. India, extension mainly places attention on the adoption of innovations, while in many former communist countries most attention is on investment and marketing decisions. Farmers all over the world may need support with the whole range of decisions.

Financing agricultural Extension

In most countries agricultural extension has long been provided by a government service paid for by taxpayers.

More recently a variety of ways to finance extension has emerged mainly as a result of the tendency to privatise government services and the increasing role commercial companies play in agricultural research and extension. This raises the question: What are the implications of the ways in which agricultural extension organisations are financed regarding the service that is provided to growers?

The mechanisms through which an extension organisation is financed can affect the decisions made by the extension organisation relating to: goals; target groups; extension methods used extension messages;internal organisation; and cooperation with other organisations promoting agricultural development.

Decisions that are made regarding these issues carry with them a number of implications for the ways in which extension supports growersers. For example, does one teach growers to use technologies which incorporate information and skills in specific devices and products (planting materials, agrochemicals, machinery, etc.), or the information and skills of management practices?

Economists make a distinction between public and private goods. Everybody can benefit from a public good, i.e. it is not exclusively or excludably available to those who have paid for it. A public good is not subtractable, i.e it is still possible for others to use the good after it has been used by someone – this is usually the case.

Extension organisations can be financed by:

1. a government service paid for by taxpayers;
2. a government service paid for by a levy on certain agricultural products;
3. a commercial company selling inputs to farmers and/or buying their products, which in its relationship with its customers also uses extension;
4. a farmers' association which pays for extension from its membership fees;
5. a farmers' association which is subsidised by the government;
6. a non-governmental organisation (NGO) which is financed by donations from inside or outside the country and/or by commercial companies for public relations purposes;

7. an NGO which is financed by subsidies from or contracts with the government (either the national or a donor government);
8. a consulting firm which charges a fee from the farmers, who are its customers;
9. a publishing firm which sells agricultural journals or other publications to farmers;
10. different combinations of the above.

    For example, it is possible for a government to pay the salaries of extension agents, whilst most of the operational expenses are covered by a farmers' association, or for a commercially-oriented cooperative or input-supply company to send a farm journal to its members/customers.

Perspectives on agricultural extension

Is decision-making within the extension programme centralised or decentralised? To whom are extension agents accountable? These factors are interrelated; for instance information on a decision to adopt a technology is less excludable than information on the transfer of the farm to the next generation.

Agencies who finance an agricultural extension organization do so because they see it as a method to reach their own goals. Since the goals of different agencies in an agricultural knowledge and information system (AKIS) are different, so are their reasons for investing in extension.

CONCLUSIONS

In many countries we see the development of a pluriform extension system in which only a part of the extension service is either provided or funded by the Government. Other organisations such as commercial companies or NGOs may be involved both in providing and funding extension services, and growers themselves may also help to finance these services. The question of how one can promote cooperation and coordination between these various organisations ?. Although it is hard to defend public funding of agricultural extension if the benefit is only for the farmers who use this service, there are many situations where the public at large also profits from the extension services, e.g. by lower prices for their commodity or a reduction in environmental problems brought about by a change in production.

Government-funded extension is likely to focus its activities on public good activities which the market place is unlikely to provide. Such activities include 'broad' rather than 'specific' technology transfer, dissemination of environmental and resource technology, and human resource development. Some additional points can also be made:

- It is important to analyse what effects the financing of extension (and research) will have on the flow and management of information, the choice of extension goals, methods used and the groups targeted.

- In deciding who pays for extension one should take into account the wider benefits brought about by an increase in the efficiency of agricultural production and associated decrease in the cost of the produce.

- In countries with the highest levels of productivity, agricultural labour productivity is over 100 times as high as in the countries with the lowest levels of productivity (World Bank, 1998). Extension in countries with high productivity levels should be financed quite differently from those with low productivity levels.

- In countries where the price policy causes surpluses of agricultural products, one cannot expect that the government will be willing to pay an extension service to increase agricultural production. Growers have to make a range of very different decisions. The optimal way of financing agricultural extension depends on which type of decisions one tries to improve. Advice from a consultant paid by the grower is most desirable for farm-specific investment decisions.

- The way of financing agricultural extension influences to whom the extension agents feel that they are accountable. This affects whether they try to work in the interest of (a certain group of) grewers, government policies, politicians, managers/ shareholders of their organisation or others.

- Extension messages about government policies should be financed in a different way from extension which tries to help growers to increase their productivity and their income.

Privatisation

Decisions on the privatisation of agricultural extension are often based on very limited knowledge about the consequences of such a change. More research in this area is urgently needed. There is more experience of privatisation in industrial countries than in developing countries. Extension administrators in developing countries should make use of this experience in their decisions. But of course, they may also have to consider whether the recommendations of a consultant from an industrial country are really valid in their situation.(Reference; Agricultural Research & Extension Network, paper No. 106)