

# DIFFUSION AND ACCEPTANCE OF FARM TECHNOLOGY: A NEW APPROACH

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**W**e live in a fast changing world which is characterised by rapid changes in human society and great demands for strenuous and considerable efforts on the part of all those working in agricultural areas, in order to adapt successfully to the new facts that day-to-day are shaped. The main goal for farm operators is rationally to be successful. Farmers especially, are forced to respond to changing conditions by trying to adapt themselves to agricultural modernization in producing good yield and high quality crops.

Among the views related to agricultural modernization the approach of integration of agricultural technology is placed.

Yet, technological changes do not occur in vacuum. Neither do they act independently on the other factors in the production process nor they are relieved from impacts on the environment where the farmer lives and works. They exert influences on local communities, on farmers' values and beliefs and on economical and ecological conditions in rural areas. Even more, technology is not simply adopted but it is influenced by a mix of elements and relationships in the rural society.

Farmers are seen as «users» rather than as active problem solvers, in their own right. Emphasis is given to flow of knowledge and information instead of their transformation and incorporation into the whole system. It is always assumed the integrity of technology as an unchangeable product, while the evidence shows that technology is usually adapted and transformed as it moves through the system or diffuses among the farmers.

Farmer's success is usually measured by his efficiency (by doing things correctly), regardless whether the manner is effective to him or not. Yet, success is not always secured unless the information needed is able to answer the following questions:

— how is the situation where farmers run their farms?

— what are the problems that farmers are faced with and what are the causes of their

## Abstract

Farmers try to respond to the increasing demands for high quality of products by adapting technological changes on their farms. Innovations have impacts not only on the agricultural production but also on the relationships within the agricultural sector. Farmers must have a capability which adapt themselves to changes in production techniques as well as to the ideas and issues which determine the new demands needs and claims.

The classic theory of diffusion is based on the process of automatic diffusion of innovations into a social system, where it is supposed that conditions are favourable for all farmers. Yet, changes do not happen in vacuum. They come up against the claims and rules of society, and the technology is usually adopted by the farmers who have relatively comparative advantages over others. Nevertheless, technology is usually imposed by the State pursuing to fulfil longrun national goals, beyond the individual farming conditions.

To what extent the economic, social and cultural traits are being taken into consideration? To what extent socioeconomic consequences for technology transfer are anticipated? How much are the negative effects on ecological environment taken into consideration? The inability to answer these questions imposes the need for a new approach; knowledge transformation and utilization strategies are recommended rather than simplifying the transfer of technology into the agricultural system.

## Résumé

*Les agriculteurs essayent de répondre aux exigences croissantes pour les produits de haut qualité en adoptant les changements technologiques à leurs exploitations agricoles. Les innovations n'influencent pas seulement la production agricole mais aussi l'ensemble des relations qui existent dans la société rurale. Les agriculteurs doivent avoir la capacité de s'adapter aux changements des méthodes et des techniques de la production ainsi que aux principes qui déterminent les nouvelles besoins et prétentions.*

*La théorie classique de la diffusion est basée sur le processus de la diffusion automatique des innovations dans un système social, dans lequel on suppose que les conditions sont favorables pour l'ensemble des agriculteurs. Cependant, les changements se heurtent aux valeurs et aux règles de la société, et la technologie ne s'adopte que par les agriculteurs qui ont des avantages comparatives par rapport aux autres. Très souvent la technologie s'impose par l'Etat qui tend à réaliser des buts nationaux à long terme, au delà des poursuites individuelles des agriculteurs.*

*Les conditions économiques, sociales et culturelles qui existent dans les régions sont-elles prises en considération? Les conséquences socio-économiques du transfert sont-elles prévues? Les conséquences négatives sur l'environnement écologique sont-elles prises en compte? L'impuissance de répondre à ces questions impose la nécessité d'une nouvelle approche: la transformation de la connaissance et l'utilisation des stratégies sont recommandées plutôt que le transfert simple de la technologie dans un système agricole donné.*

occurrence?

— may unpleasant incidents and events emerge in the future?

— what should be done in order to encounter successfully the problems and to satisfy farmers' demands? The utilization of technology claims strategies able to secure a proper environment for a balanced agricultural development. These strategies have to do with agents' continuous actions and energies, in a sound operationally socioeconomical system where the pressing questions of the farmers will be answered promptly.

## Diffusion and acceptance of technology so far

Extension has been the main agency aiming at providing agricultural information to

rural people and helping them make rational use of the existing agricultural technology, in order to improve farm production and farm income.

Public Extension Service operates locally within the frames and restrictions of the state policy in trying to achieve national goals fixed by the government. These goals are very often alien to local conditions and farmers' problems needed immediate solutions.

The structural and organizational problems of the Extension Services, the bureaucratic mechanisms in their performances, the problem in handing over responsibilities, the ill-functioning processes in relation to incentives, to administrative and managerial staff deficiencies, and the lack of co-ordination among information and development services, make it difficult for the extension agents to be able to come up to con-

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temporary demands and farmers' needs. The most significant problem may be the shortcoming in adapting the agents' action strategies to contemporary structural agricultural conditions.

Until now, change agents' strategies have been directing to technical assistance, on the assumption that all conditions are favoured to all farmers who have to do nothing except taking advantage of messages («have a good message for those it is to be disseminated to and be sure that they will make efficient use of it», has been the slogan dominating in extension). In other words, it has been considered that farmers on the whole have the capability of access to production resources, to inputs, to markets, to credit and to sources of agricultural information. The notion which is usually supported is «have technology, look for users» rather than «have users, look for technologies from which they can benefit» (I.C.R.E., 1985). Extension often emphasizes efficiency which does not ensure effectiveness. It keeps on facing farmers as users or clients, by playing a special emphasis to the application of innovation technologies. Even more, technology development has been left exclusively to research institutions which work on their own principles, methods and perceptions, without taking into consideration local farming systems and farmers' productive goals. The striking slogan has been «hurry to catch the train of technology»; It is quite indifferent who is going «to catch it up». No matter what incentives and goals are set, the relationship between the transmitter and the receiver of information, though it operates in a two-way process, is actually one-sided with the receiver always being at a disadvantage and with a great dependence on the source of information. Thus, the farmer ends up being a pathetic user of technology since he misses out the necessary knowledge not only for the utilization of technology but for its consequences to his own farm, and to other farms and/or to surrounding ecological environment.

Technical information is usually diffused within a system while farmers are free to get it and adopt or reject the recommended advice. Agricultural information agents usually draw a special concern to so-called progressive farmers. Hence, it is reasonable that these farmers are in position to take advantage of technology by widening the socioeconomic gap among farmers. Finally, in our effort to narrow the knowledge gap not only do we enlarge it but worse, we enlarge the resources gap.

These consequences are not unrelated to those of economic and structural nature. The inequalities between rich and poor will gradually lead to the point where a shrink-

age in number of unprivileged farmers will occur. The reduction of those employed in farm business is likely to be welcome to Greece's agriculture. Nevertheless, the problem is not dealt with successfully, since the development of technology is not usually in balance with the high rates of absorption in work force of small farmers into other sectors of economy.

In addition, the continuation of crisis in agricultural economy, the problem of over production and the surpluses in agricultural products as well as the waste of production potentialities and resources are some examples of technology utilization consequences.

Finally, the disturbance of ecological balance as shown by the soil deterioration (due to the use of fertilisers and the insecticides, and the specialization on one or on a few crops and not maintaining soil structure), by the pollution of surface and underground water, by the poisoning of wildlife with insecticides, by the depletion of flora with herbicides, by the destruction of biotopes, by the contribution to acid rain through the production of ammonia, etc., is a result of the way on how the diffusion and application of technology is nowadays perceived.

The undesirable changes occurred to the whole mix of relationships in rural areas in no way may be avoided, except they may be restricted through a new approach by reconsidering the role and tasks of information agents and readjusting action strategies.

## A new approach

Action strategies for diffusion and acceptance of changes must be focused on a farmer who lives and works in a particular environment with specific values and perceptions that form his life attitudes. Hence, change agents have to stress emphasis not only to the way farm technology is transferred and how changes are recommended but to the transformation of knowledge and information as such.

It is necessary to pay special attention on how the needs of most farmers and groups of rural population are met, at a grass-root level and always in relation to persons' expectations as individuals, as well as members of a social system.

People's objectives tend to have a direct relationship to the physical, mental, economic and social efforts they are capable of or want to make so as to be successful. In pursuing goals, behaviour standards are determined to a great extent by what farmers consider right and useful for themselves. So, changes in behaviour standards is func-

tioned by: a) persons self-knowledge about their potentialities and constraints in their own conditions, b) their capabilities (physical and mental), c) their attitudes and values, d) their abilities in assessing alternatives and e) their lifestyles general behaviour.

Endeavours for technological changes must cope with conventional value systems and farmers' beliefs. Values and beliefs have been singled out as important elements in the change process. Values have been defined as conceptions of the desirable, as standards of evaluation, as guides for decision-making behaviour, or simply as expressions of preference (Kahl, 1968). Likewise, beliefs on what is wrong or right, what is important or not, indispensable or not, are viewed as important elements in influencing farmers' goals and behaviours. As Galjart (1971) points out, three elements determine farmers goals and behaviours: a. willingness for change, b. knowledge how to achieve change and c. capability to accomplish change.

No matter how values and beliefs are handled change agents have to recognize that there are hierarchies of values not all equally resistant to change or charged with the same emotional commitment (Sofranko, 1984:61). Moreover, identification and assessment of consequences in socioecological environment as well as the timely and accurate information of farmers are essential.

The substance in changing the way of action for technology improvements in agriculture from the notion «have technology, look for user» to «have users, look for technologies from which they will benefit» presupposes active farmers participation both in needs assessment and in the process of planning and implementation of programmes.

An objective as well as a global awareness and knowledge to farmers will provide them with abilities so that they will be able to give priorities to needs, to develop action plans and make an effective selection and utilization of technology he himself needs. Information that will provide farmer with such capability is connected to understanding of real economic farm situation, to locating and rating the worrying problems, and the alternatives he has at his disposal to overcome problems and meet requirements in a competitive market. Yet, it is necessary that information agents will seriously take into account the dynamic nature of the information needs of farmers, their productive orientation and therefore the degree of their effectiveness, the differentiation in farmers' goals and circumstances, the overlapping of tasks in extension activi-

ties, and the farmers' efficiency (to do the right things) combined with effectiveness (to do things correctly in the right time and in the right place). Special attention must be paid to the advice given which may result in misleading interpretations as it could enhance maximum production (technical optimum) that is not necessarily the best economic alternative. The optimum economic alternative on the other hand, however, may not be financially feasible in all cases. In Extension Service in Greece, which is the main agency responsible for the diffusion of farm technology, structural and institutional changes either at central service or at regional service level, and a decentralization in decision-making matters as well as a participatory programming are needed. It is essential for a redetermination of the role and tasks of the extensionists, focusing on: a) increasing farmers efficiency and effectiveness; b) identifying solutions for every locality, so that farmers be entitled to selecting technology improvement and be in position to control its adaptation at local level; c) enhancing the farmer's efficiency with the aid of study groups and «specialists»; d) training of more «generalists» for the testing of farm models to be technically-biologically acceptable, economically just

and financially feasible; and e) enhancing the capacity of farm families to cope with their environment and respond to new opportunities more productively.

At the same time, vocational agricultural training has a major role to play. It will not be confined to technical matters but it will be opted to provide farmers with all necessary information related to local conditions and to state agricultural policy. Education that helps farmers to identify and solve problems, to gain confidence on their own skills and on government plans and to gain freedom in decision making processes is more effective in the long run than simply using extension as a distributive mechanism for research results. After all, changing technology is not the issue. The real issue is how extension professional will interact with technology. The reproduction of problems is not a matter of the farmer himself, but is due to extensionists' inability to predict and interpret trends, and to develop the proper sociopolitical measures and strategies that could benefit the utilization of science and technology.

Diffusion and adoption of farm technology do not occur independently in an area, but they are related to the whole developmental policy in a specific region of a particular

country. They constitute an element of the national plan for rational exploitation of resources, for setting priorities and specifying goals to be fulfilled.

Technology must not be a reproduction of a foreign technology that is developed beyond farmers' local needs and problems, but it should be combined with the general structural changes in rural society and in the society of the whole country. It is not a panacea which is expected to solve automatically all problems or to abolish inequalities in any form.

Farm technology, land technology in general, is simply an element of development acting jointly with others.

## References

Galjart, B.F. (1971): Agricultural Development and Sociological Concepts: A Critique. *«Rural Sociology»* 36, 31-41.

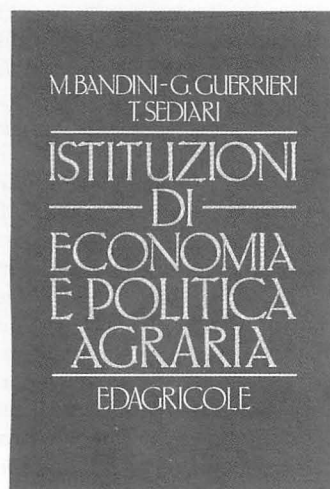
International Course on Rural Extension (I.C.R.E.). (1985): Knowledge Transformation and Utilization. International Agricultural Centre, The Netherlands.

Kahl, J. (1968): *«The Measurement of Modernism»*, Austin, Texas: University of Texas Press.

Sofranko, A.J. (1984): Introducing Technological Change: The Social Setting, 56-76, in B.E. Swanson (ed.) *«Agricultural Extension: A Reference Manual»*, F.A.O., Italy.

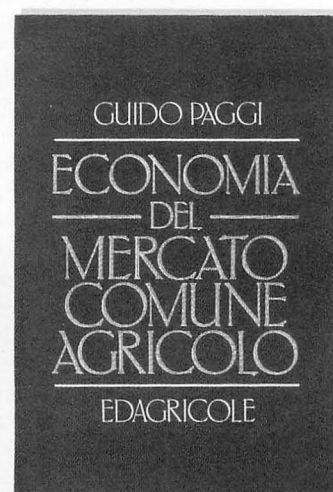
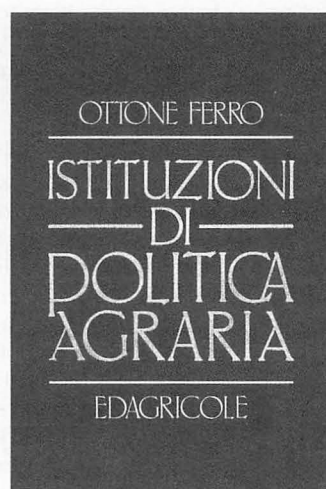
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