

INSTITUTO INTERAMERICANO DE COOPERACION PARA LA AGRICULTURA -IICA

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FSR in LAC: Past Experience and Challenges for the Future¹

EDGARDO R. MOSCARDI²

I INTRODUCTION

This paper intends to bring to the surface the main questions around FSR problems and opportunities in LAC, given the dynamic of the economic development and the past and future role of agriculture and agricultural research in the region.

First part of the paper develops briefly the LAC agricultural development in perspective, pointing out the new role for agriculture as an engine for economic growth, and the importance of technological progress as a source to increase productivity.

Second part, deals with the role of FSR under past and new circumstances, involving the private sector, donor agencies, international centers, and the new demands for agricultural research and extension.

Third and final part, presents the challenges for the future healthy survival of FSR in LAC. Training is emphasized as a strategical consideration requiring a more formal and systematic approach in support to FSR.

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II LAC AGRICULTURAL DEVELOPMENT IN PERSPECTIVE

Abrupt changes have been observed in the LAC region since the 50's in terms of growth, urbanization and modernization, along with a marked trend to diminish the reliance of economic activity of the primary sector spurred by important developments in industry and services. The strategy of import substitution and cheap food policies of the 60's, supplemented by export promotion in the 70's were based on a model of industrialization largely at the expense of the agricultural sector.

Agriculture went from contributing 21% to GNP and 54% to employment in the 50's, to the current levels of 10% and 25% respectively in rough numbers.

The failure of the import substitution and self-sufficiency model became evident in the 80's, to the point that the decade has been labeled the "lost decade" Lost, due to structural problems related to the high debt situation - LAC has been the region hardest hit by the international debt crisis -, permanent fiscal deficits, hyperinflation, unemployment, and the outburst of parallel and informal economies, that finally led to decapitalization and recession of the region. By 1989, per capite income was 12% lower than in 1980, and investment decreased in the same period from 24% to 16% of the GNP. Besides, together with this loss in acquisitive power, there was a worsening of the terms of trade. The value of agricultural production grew at an annual rate of 2% for the period 1979-86, at the time that imports decreased at an annual - 5.3% for the same period. The LAC region has been at net food importer for the last 15 years, and a loss in nutrient intake was registered, as compared with the previous decades.

But the 1980-90 decade has not been lost in terms of lessons for agriculture. In spite of the model of the 70's based on discrimination, in almost every country this sector outperformed the rest of the economy. Besides, agriculture expanded its

linkages with other sectors and services, and agroindustry has been the main component of the observed growth in manufactures. Taken as a whole, the agricultural complex has been, not only efficient, but also the most dynamic of the economies in LAC. The development of those backward and forward linkages, along with the efficiency and dynamism of this complex, make it a unique one for the reactivation of the economic engine, and constitute the basis for pointing at agriculture as the most plausible source of economic development for the coming years in the LAC region (Piñeiro, 1989).

The beginning of the decade of the 90's has seen many countries in LAC seriously engaged in reforming inefficient policies of the past. Progress has been made in "getting prices right", in liberalization policies shaping more open economies, and in trade integration with the emergence of several new mega-markets, e.g. the Free Trade Agreement (FTA) involving Mexico, USA and Canada, the MERCOSUR involving countries of the southern cone, among others.

Under these new set of policies, the issue of competitiveness for agriculture has come into the arena. The role of technological progress has been emphasized as an engine of overall economic growth, and as the one fairly reliable key to underpinning the future productivity gains that will be needed on the supply side of the world food equation (Petit and Anderson, 1991). Within this context for technological progress new opportunities for FSR are at hand, in particular for the LAC region, since now with the face out of subsidy and discrimination policies and more open economies in the region, agriculture will have to rely on technology almost as a unique source to improve its competitiveness. Having said this, a word about the relation between agricultural technology and rural poverty is appropriate. Even for LAC, despite of high urbanization rates, poverty tends to be more serious in rural areas, and it has increased quite dramatically in the last ten years. Under these circumstances, it has been common to think in technology as a tool to shift the distribution of income in favor of the rural poor, but technology is only one of three factors that determines

incomes, the other two being resources under control and price received for the outputs (Schuch, 1988). Technical change in food grains has been an important instrument for alleviating poverty in many countries, particularly in Asia. For the case of the LAC region, with increasing incomes and more open economies, it is likely to occur a weakening of the link between augments in food grain productivity and reduction in poverty through lower prices for food staples. This is because in an open economy increases in agricultural productivity are less likely to be translated into lower prices for consumers (Byerlee, 1991). These are facts within market open economies that FSR will need to internalize in order to remain as a relevant enterprise.

Along with policy reforms, there are two other strategic considerations to assure the key roles for agriculture in development, they are: institutional building or enhancement, and the management of natural resources. LAC has been quite rich in developing national as well as regional institutions serving the agricultural sector (Moscardi, 1992). However, looking at the quality of governance of some of those institutions gives one no great cause for comfort (Petit and Anderson, 1991). Ruttan has recently emphasized the importance of developing "incentive compatible institutions", between the private and social objectives, pointing out that in absence of such institutions, more efficient than the actual ones, the transaction costs implicit in the ad-hoc approaches will be probably quite high (Ruttan, 1991). The third area of concern is natural resource management. More open economies and trade integration along with that new role for agriculture as an engine for economic growth, will lead to a greater specialization and higher intensification in the agricultural production process for the LAC region. Consequently there will be an additional and dangerous pressure over the natural resource base. Agricultural research in general and FSR in particular, have been often in the past too dominated by short-sighted methods. Technical progress can be an important element in sustaining the resource base, both directly through development of "environmental-friendly" technologies, and indirectly through reducing the pressure to move to more marginal lands (Byerlee, 1991).

III ROLE OF FSR: PAST AND PRESENT CIRCUMSTANCES

To analyze the FSR movement from a historical perspective seems to be the logic frame for an interpretation of its impact and future role in agricultural research for the LAC region. Certainly, the underlying circumstances and problems motivating the beginning of FSR, almost twenty years ago, were quite different to those developing countries are facing now and particularly the LAC region.

Basic concern in the late sixties was that few farmers in developing countries were following the recommendations of researchers and extension workers. Based on a series of CIMMYT sponsored country studies examining factors influencing the adoption of new maize and wheat technologies (essentially improved varieties and higher rates of fertilizer), it was concluded that:

The most persuasive explanation of why some farmers do not adopt new varieties and fertilizers while others do, is that the expected increase in yield for some farmers is small or nil, while for others it is significant, due to differences (sometimes subtle) in soils, climate, water availability or other biological factors (Perrin and Winkelmann, 1976).

Those studies and other developed for different crops and regions, gave support to the idea that recommended technologies were often not appropriate for representative farmers. This, in turn implied that more attention be given to the research systems which develop technologies (Winkelmann and Moscardi, 1979). One basic lesson from these studies was clear for FSR practitioners: "income and risk were prominent farmer concerns, and these variables strongly influenced by the natural and socioeconomic conditions of particular farming systems were farmers made choices about alternative technologies".

At the bottom of this discussion there is a difference in perspective as a natural consequence of scientific specialization. Farmers perceive the value of economic information including that pertaining to new superior crop varieties and associated inputs more readily than crop scientists perceive the value of economic information relevant to their own work (Schultz, 1980). Perspectives and methods developed by FSR, have contributed to agricultural research by conveying economic and other information and analysis to those crop and other scientists engaged in forging improved technologies. Regardless changes in the perceived problems and circumstances that certainly have taken place in the last two decades, the task of conveying relevant on-farm information to agricultural scientists is seen as a permanent and fundamental activity for FSR.

The beginning of FSR was inevitably stained by the schultzian "poor - but - efficient hypothesis" - Hence, most increases in productivity had to come about through introduction of new high pay-off inputs into traditional agricultural systems, leaving little room to improve economic efficiency in farmers' resource use. Speeding up the adoption of Green Revolution type of technologies, was by those days one basic concern for a many FSR practioners. As a consequence, emphasis was on research problems requiring results intended for near o intermediate term application, e.g. varieties, fertilizers and pest control technologies.

Another important observation for developing countries is that during the sixties and the seventies, few entities - agri-business complex, NGOs, farmer's organizations - were engaged in any on-farm work, sort of mediating between an agricultural research highly concentrated on problems emphasized by professional disciplines, and the reality of representative farmers (Winkelmann and Moscardi, 1979).

At least for LAC, perceived problems and circumstances related to agricultural research and extension have changed significantly in the last twenty years. Firstly,

many low and middle income countries have experienced an important transformation of their agricultural sector through technical change. In these countries, the required technological progress for the future, at least for grains, is likely to be that of the post-green revolution type, much more knowledge and skill intensive than in the past. Moreover, in those countries, incomes have now reached a level when food grains will tend to decline both, as a share of farmer' income and as a share of consumers' expenditures. Consequently, a natural process of diversification has started with consumers demanding higher value food products such as fruits and vegetables, and meat and milk (Byerlee, 1991).

This transformation in the economies of the countries, along with the development of a more commercial agriculture, domestic as well as export oriented, is likely to bring important changes at the farming system level with less products, and perhaps more monoculture, on the one side and more intensification on the other. Needless to say how all this will affect the sustainability of agricultural production. These are again some of the consequences of the model for economic development being implemented in LAC, with deep implications for agricultural research in general and FSR in particular.

Secondly and closely related with the first are the problems associated with environment and natural resources degradation, plus those derived from the need of equity in terms of social groups, gender, farm size and generations, posing a great challenge for the development of "environmental - gender - etc - friendly" technologies. A certain degree of complexity and the need for a longer term research will be unavoidably to develop that type of technologies.

Thirdly, it has been noticeable the participation of the private sector in experimentation and adaptive research, fulfilling some times the role of integrating entities and contributing to make research systems more effective in forging improved new technologies. Some of the traditional INIAS (Semi-autonomous national

agricultural research institutes), the main institutional innovation of the sixties in LAC, are becoming nearly private entities, e.g. the INIA of Uruguay. Several agricultural research foundations have been created and operate under the guidance of directing boards with participation of farmers and other social actors; a number of joint ventures to generate and transfer agricultural technologies have been developed between the traditional INIAS and the private sector, utilizing appropriate incentives to encourage researchers of those public institutions to play an integrative role; farmer's organizations have developed their own schemes for agricultural experimentation and applied research. Finally, the agri-business complex has expanded encouraged by intellectual property rights laws for agriculture operating now in several countries of the region. Despite all these, private sector efforts still remain small in comparison to their potential contribution.

Last twenty years have seen the LAC region building up a research system which is mature enough both, to develop closer partnership with the international center of the Consultative Group for International Agricultural Research (CGIAR) and other research institutions in developed countries, and to establish networks for cooperative research and information sharing among different countries. There are four actors in this system that have had good interactions in the different regions of LAC, they are: the INIAS of the countries and their partner institutions, a set of regional programs and networks for reciprocal cooperation in the exchange of experience and joint research, two regional research and education Centers, the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) and the Caribbean Agricultural Research and Development Institute (CARDI), and the three CGIAR international centers located in LAC (CIMMYT, CIAT and CIP). The idea is that a system like this can effect a better division of labor in agricultural research, introducing a more efficient utilization of resources and comparative advantages of each institutional actor (IICA, 1991).

This system has provided excellent grounds for a proliferation of on-farm and FSR methodologies in the region. The CGIAR centers located in LAC pursued a range of FSR approaches that produced a rich variety of research methods and results but also contributed to growing uncertainty regarding the place of FSR within the INIAS (Tripp, 1991). The Farming System Support Project at the University of Florida, sponsored by the United States Agency for International Development (USAID), was another source of FSR methods and training that had influence in Central America and CATIE. Several attempts have been made for institutionalization of FSR in INIAS of the region, noticeable in Guatemala, Panama and Ecuador (Merrill- Sands, et al, 1989).

It could be said without any doubt, that so far most agricultural research institutes in LAC have developed some form of on-farm or FSR capabilities or program. Most interesting, some former trainees of OFR/FSR courses and seminars are by now exercising responsibilities as research managers in research programs and experimental stations.

Following the idea that the contributions of FSR can be classified as perspectives and methods, are the former perhaps where an impact can be seen judging from the fact that agricultural research priorities are now less planned from the top down, while more effort is being made to understand local farming conditions and problems as a base for planning research (Tripp, 1991). Regarding methods, procedures for the various stages of FSR have been adopted in bits and pieces by several research programs in LAC. It is probably the stage of diagnosis, with the several methods developed for gathering information and interviewing farmers, the one with the largest number of followers. Assessment, in particular through the application of partial budgets for economic analysis of trials data, has gained too a number of adept. Planning and experimentation are the stages where either, methods were developed later or face the inertia of that experimental tradition of having nice trials, with little farmers participation. These two stages are precisely the ones to be revised in light of the implications, for agricultural research and FSR, of the model for

economic development being implemented in LAC.

In brief, despite the fact that FSR could have been poorly implemented in many regions and projects in LAC, both in terms of incomplete application of the FSR stages and relative failure in meeting high research standards, there are still many examples of high quality work that have resulted in delivering "really improved" technologies to farmers.

Question now is how to keep the effort going on and adapt FSR to contribute to the new challenges for agricultural research and extension.

Three sets of problems are behind a certain loss in institutional strength observed lastly in the FSR movement. Firstly, there are the problems associated with the organization and management of this type of research in national programs and due to this the perception, and consequently the criticism, that FSR instead of improving the efficiency of the research process, has become an end in itself (Tripp, 1991). Secondly, the withdrawal of support from international centers and external donors has created not only uncertainty for future funding of FSR projects, but also a limitation in the opportunities for training in this field. Thirdly, most public agricultural research programs in LAC have expanded very quickly in the past. The number of commodities with some degree of research coverage have increased rapidly, and the research staff grew over time, despite an often high turnover, at faster rates than funding in real terms. As a consequence, average spending per researcher has tended to decline, in particular for operational expenses. In turn, FSR work requiring increased field presence and an assignment of staff to particular farming systems and areas within a country, have suffered more this lack of funding for operational expenses.

IV CHALLENGES FOR THE FUTURE OF FSR IN LAC

In light of those new circumstances facing agricultural research and technology transfer, FSR will have to develop and/or enhance backward and forward type of links. Backward linkages with applied and strategic research, to ensure the incorporation of a longer term vision in FSR. Forward linkages with technology transfer and technical assistance, to bring the perspectives and methods of FSR for the solution of some of the problems associated with the second generation of inputs and management practices of modern agriculture. Links between FSR and other actors in the research process have been traditionally quite weak. The new demands for agricultural research and extension create further needs to develop incentives, institutional as well as pecuniary, to strength such links.

FSR teams have been often dominated by social scientists, under the paradigm that planned agricultural change needed to be organized around a clear understanding of farmer's conditions and priorities. The expansion of the research agenda with the incorporation of new dimensions, such as the one around sustainable agriculture, of particular importance in the LAC region given the new role assigned to the sector, will demand from FSR teams a much more multi and interdisciplinary work than in the past, in order to develop the new methods required to forge "environmental-friendly" technologies.

In many areas of LAC, a new and more complex second generation of inputs and management practices are playing an increasing role in productivity growth. Investments in better information and skills of farmers, to improve economic efficiency in using this wider away of inputs are needed to maintain the momentum in post green revolution agriculture (Byerlee, 1987). It has been argued that in a dynamic agriculture - which is being the case in LAC with the tendency to more open economies and free trade--, farmers are continually in a state of disequilibrium and

that there are high returns to better information and skills to improve farmer's economic efficiency (Schultz, 1975).

A second set of challenging issues confronting FSR, is related with the effective institutional arrangements and the more efficient resource use. Two ISNAR large studies, one dealing with Organization and Management of On-Farm Client-Oriented Research, and the other with Research and Technology Transfer Linkages, have produced many enlightening principles and lessons in these fields but so far at least, we have seen little or no influence of those findings for better organization and management of FSR. It is beyond the scope of this paper to explore the issue further, but the lack of more formal and systematic channels to reach appropriate managers is likely to be behind such a poor influence of such studies.

And this points out the third field of challenge for FSR, as it is training. We refer here to in-service training as well as graduate training. With the withdrawal of support from international centers and external donors, opportunities for training have been reduced. Some alternative approaches have been developed although. Within the policy of "devolution of responsibilities" from CGIAR Centers to national programs, CIMMYT and INTA of Argentina, with financial support from the Interamerican Development Bank (IDB) and the International fund for Agricultural Development (IFAD), have developed and agreement by which INTA has taken primary responsibilities to offer annual six months OFR training courses around wheat production. CIMMYT supports with training materials and expertise for the first two years. Another interesting training initiative is being developed in Colombia, where a private rice producers association (FEDEARROZ) and a regional local University (University of Tolima), have developed a joint program to offer a degree in rice production specialist. CIAT is also collaborating with this program, which has OFR components but is oriented mainly to train technical assistants for rice farming systems in the use of the more complex second generation of inputs. Rice yields in Colombia have declined consistently for the last five years.

Short courses and seminars for FSR are often organized by national programs with the support of networks and regional and international organizations, but they are insufficient and with little or no continuity so as to meet the type of needs for training in this field.

Regarding graduate training, despite those MS programs offering degrees in Farming Systems and Rural Extension in many countries - Mexico, Costa Rica, Brazil and Argentina - including the USA, relative little use is made of the large body of knowledge and experience developed around FSR.

A more systematic approach is needed for both, short term training in the perspectives and methods of FSR, and graduate training where through research a substantial contribution could be made to those FSR practitioners and managers facing the new challenges of agriculture.

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