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Markets and Modernisation: New Directions for Latin American Peasant Agriculture

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Introduction

Latin American agriculture is facing fundamentally new economic, cultural, political and social conditions, with implications for agricultural development. This paper examines these changes and discusses the vulnerability of the conventional approach to agricultural development within this new context. It looks at successful recent ventures in a number of different countries, and draws lessons from these about what is needed for Latin American peasant agriculture to adapt to these changing circumstances.

Changing Circumstances in Latin American Agriculture

Until recently, the main objective of Latin American agriculture was to provide basic food staples at a low cost to sustain the growth of the urban-industrial sector, considered the main engine of our economies. The economic issues of the 1980s and the pressure caused by the size of the external debt of some Latin American countries marked the collapse of the prevalent import substitution model. All the major countries and many of the smaller ones implemented structural adjustment programmes to deal with the external debt issue and, immediately after that, to reorient the economy under a fundamentally new paradigm.

The major characteristics of the new economic model include the following:

- Free market rules and conditions prevail.
- The axis of economic development has shifted from the industrialization and import-substitution policy that had been in effect for several decades, to an export-oriented strategy.
- Most agricultural compensation and regulation instruments have been removed or downsized so that market forces can take over.

- Regional and international trade agreements and economic integration mechanisms were adopted by most countries in the region, to increase their market size and in response to the economic blocks created by Europe, the Asian Pacific region and North America.

These changing circumstances mean that the viability of Latin America's agricultural sector rests on its ability to compete with price and quality standards set by the international markets. This is obviously and immediately true in the export sector, but it will become an increasingly valid condition for that fraction of agriculture which is oriented towards the internal markets and that is being forced to turn out products at a similar cost and with comparable quality than those which could be bought in the open international market.

Peasant farms, linked as they usually are to the traditional agricultural subsectors, have faced a deterioration of their production structure and of their capacity to compete in a relatively free market economy. This is aggravated by the reduction of government expenditure on physical and production infrastructure in areas of small-scale producers and by reducing investment in rural development programmes.

The new economic climate has also aggravated the bimodal characteristic of the agrarian structures of most Latin American countries, in which there is a segment of commercial agricultural firms, more or less modernised alongside peasant production-consumption units.

New Opportunities For Agricultural Development

Although this new scenario creates important and difficult challenges for Latin America's agricultural sector, it has also opened new opportunities.

Peasant agriculture continues to be a major economic reality in Latin America. In the 1980s, it controlled over 33% of the arable land and over 40% of the harvested area (Kay, 1994). Peasant farms employed two thirds of the labour force, and supplied 40% of the internal market products and 33% of the export goods (Kay, 1994).

Several new phenomena may facilitate the task of achieving more equitable growth in the Latin American rural areas (de Janvry, 1994):

- Democracy has returned to almost all countries in the region;
- NGOs and Grass Roots Organisations (GROs) have proliferated in direct relation to the downsizing of the public apparatus;
- Real exchange rate depreciation and trade liberalisation not only reduce the bias against agriculture in general, but also tend to favour small-scale farms which are more intensive in the use of non-tradable inputs ie., those that are not traded in the international markets, such as family labour;
- Public expenditure in agriculture increased slightly at the end of the last decade, as compared with a strong decline in the previous period;
- Improved technologies are being developed for peasant farming systems and new partnerships are being developed between government agencies and non-governmental organisations (Bebbington et al., 1993);
- There are rising concerns for environmental protection.

Agricultural research and development in Latin America must make fundamental adjustments to stay in tune with this new scenario and make the most of these new opportunities, or else it will become irrelevant. To start with, agricultural researchers such as ourselves need to be able to evaluate our achievements and, above all, our shortcomings.

What's Wrong With The Past Approach to Agricultural Development?

Since the early 1970s, a number of major systems-oriented agricultural projects, involving tens of millions of dollars, have been implemented in the region. Since many small-scale, resource-poor farmers had not benefitted from the Green Revolution, the projects aimed to adapt and disseminate appropriate technologies that could be adopted by these peasant farmers (Byrnes, 1993; Escobar and Berdegué, 1990). The systems approach consisted conventionally of five stages: (1) characterisation or diagnosis; (2) design; (3) on-farm research; (4) validation and (5) dissemination.

There is no doubt that this approach had important positive impacts in Latin America. It made an important contribution to redefining agricultural research and extension in the region and in opening new opportunities for small-scale farmers to be integrated into these activities. However, with some exceptions, many of these projects did not achieve their objectives (Berdegué, 1993; Byrnes, 1990, 1993; Hibon, 1993). There are several reasons for this. We will emphasise four of the more fundamental issues here:

- Focus on increasing supply and missing the importance of off-farm factors. A large number of conventional projects were designed solely to increase the output of the farm system through disseminating appropriate technologies. It was often forgotten that farmers' decisions are greatly influenced by such off-farm factors as regional and seasonal opportunities for off-farm employment, availability of transportation, possibility to trade goods with farmers from the same or other villages, non-agricultural income, and many other variables related to different markets for goods and services (Berdegué et al., 1990; Espinosa et al., 1990; Martínez et al., 1990; Miranda, 1990). Instead, the off-farm environment was perceived basically as a source of problems, a source of constraints, and rarely as a source of opportunities.
- Narrowing the operational field to the farm. Many of the conventional research and development projects forgot that practising agriculture means more than growing crops or raising cattle. Even when projects are successful in adapting new appropriate technologies and in stimulating their adoption, many technical and institutional obstacles usually still remain to be solved before the increased output can get to the consumers at the appropriate time, with the required quality and at a competitive price.
- Overlooking the role of farmers' organisations. It was rarely understood that together with achieving a specific technological or production objective, mechanisms are needed to strengthen the permanent capacities of local communities to innovate, administer and disseminate the innovation. Successful technical change in small-scale agriculture is always a collective enterprise, involving local communities and microregions rather than isolated, individual farms. To a large extent this explains why the positive results of

many projects dissipated after the external sources of funding and technical support were terminated.

- The inability to build strategic partnerships. Many of the limitations of these projects can be traced to the fact that most were implemented by a single institution or by one or two institutions with an analogous mandate (eg., an international and a national agricultural research agency). However, enhancing the farmer's ability to compete in national and international markets requires strategic partnerships between complementary organisations, with farmers' organisations always at the centre.

New or emerging societal concerns, such as sustainability, also added complexity to this picture, for in general they meant the obligation to incorporate and act upon new dimensions, such as time and cultural variables, that were at the root of the new issues. It is not surprising that many projects reacted with a combination of generic conceptual acceptance of the new questions and effective incompetence to deal with them in practical terms (Box 1).

Box 1. Sustainability: An added complication

In Latin America we are still far from having designed efficient and practical ways to operationalize the concept of sustainability or even to agree upon basic indicators to deal with it (Harrington et al., 1994). The sustainability issue implies the operationalisation of the time variable at least over one generation, and this is an impossible task when the analytical and operational horizon of the conventional systems-oriented projects usually do not extend beyond three to six years. Incorporating the dimension of sustainability also means that projects need to be able to deal with trade-offs in farmers' objectives. There are trade-offs over time (eg., short term versus long term family income), over space (eg., upstream versus downstream benefits of a watershed management project), and across objectives at any one time and space (eg., reducing soil erosion and family income in the short run through less intensive crop rotations). By over-concentrating on the farm as the reference system, by defining expected products in terms of technology adoption, and by reducing the importance of 'macro' and sectorial variables, the conventional formulation of the systems approach places additional conceptual and operational constraints on the integration of sustainability.

In summary then, this reductionist approach meant that the farm was isolated from its environments in general and from the markets in particular. Addressing this issue must now become the conceptual and methodological priority given the current dynamic conditions, changing objectives and new concerns.

A Way Forward for Small-scale Agriculture in Latin America

A new generation of initiatives in Latin America is addressing many of the shortcomings described above. The examples in boxes below are only a small sample of these. Analysing these approaches highlights six common characteristics. Each has attempted to:

1. search aggressively for new sources of competitiveness;
2. integrate dynamic and often contradictory attributes and objectives of development (such as sustainability, and social equity), resisting the temptation to move them out of the picture because of their inherent complexity;
3. think and operate in terms of broad systems such as agroindustrial chains and regions;
4. build strategic alliances and partnerships;
5. foster functional and efficient farmers' organisations and other such permanent capacities of local communities; and
6. focus on the quality of processes and not only on products.

These characteristics are discussed briefly below, illustrated by examples from the region.

Identifying Market Opportunities And Achieving Competitiveness

Even where transitional periods have been established to allow the more disadvantaged sectors of the rural economy to adjust (eg., 15 years for some basic staples in Mexico under the new Free Trade Agreement with the US and Canada), it is a hard fact that under the new rules of the game, small-scale farmers will eventually need to compete under more or less the same rules that apply to all producers.

The new generation projects have been able to construct a clear and precise idea of the market demands that they are trying to fulfill (Box 2).

Box 2. Natural Foods of Irupana, Bolivia

Natural Foods of Irupana was formed in 1987 by a group of professionals linked to NGOs, who were interested in experimenting with a new type of microenterprise capable of working according to market rules (Hurtado, 1994).

Initially, the firm tried to compete in the regular coffee market, but found that "...this was the first lesson: Microenterprises cannot and should not compete in the mass products market, on the contrary, they must take advantage of the quality of their labor to make high quality products, with greater added value and higher price. Paradoxically, our market is in the rich social classes..." (Hurtado, 1994). Following this rule, Irupana started making sugar-free toasted coffee, introducing after that new types of natural foods, produced from over 25 kinds of agricultural products bought from small-scale farmers.

For example, Irupana buys coffee from peasant farmers with a scheme that is different from that used by the traditional intermediaries in that it pays a quality bonus of up to 15% and provides technical assistance. Irupana now has a network of peasant suppliers who process their coffee with special attention to quality.

The new approaches must incorporate top-quality market studies to define in precise

terms the products and varieties demanded by buyers and needs in terms of quality, packaging, presentation, labelling, volume, and opportunity.

Integrating The Goals Of Competitiveness, Sustainability And Social Equity

Many agricultural research and rural development projects have become trapped in a false dispute between the search for economic, environmental or social objectives (competitiveness, sustainability and social equity, respectively). New generation approaches are showing in a practical manner that these three objectives in effect reinforce each other and are mutually necessary for the sustainability of each of them in the long run.

The Economic Commission for Latin America (CEPAL, 1990) has indicated that long term competitiveness can only be achieved if the increasing participation in the markets is achieved simultaneously with an improvement in the levels of well-being of the population. In other words, in the long-run economic competitiveness cannot be based on such factors as low wages or declining investment on educational, housing, or health systems. This is so because, increasingly, economic development is based on such factors as information-intensive production processes, permanent technological innovation and high savings rates to finance investment, which are not compatible with an impoverished and marginalised population. "The dividing line between the successful and unsuccessful experiences of international insertion, apparently is linked with the efficient use of resources at a given time and with the capacity to undertake activities which require a growing intellectual added value." (CEPAL, 1990).

Moreover, it is increasingly improbable that competitiveness can be achieved and maintained if it is based on production systems that are not environmentally sustainable. Partly this is because 'environmental quality' is being appreciated by consumers as a desired attribute of agricultural products; the debate in Brazil about sugarcane production, or the worldwide concern about livestock systems in deforested tropical rainforests, or the standards set by the European Union for the packaging materials used by Chilean fruit exporters, are examples of this factor.

Secondly, competitiveness and sustainability are increasingly interlinked attributes because inter-sectorial environmental conflicts are being recognised as important sources of inefficiency. An example is the conflict in the coastal region of Ecuador between banana growers and shrimp producers over the use of pesticides that apparently affect the environment in which shrimp larvae develop. Thirdly, numerous cases show that environmental degradation has become the main cause of decreasing productivity and/or increasing production costs (de Camino and Muller, 1993).

However, it is easier to recognize conceptually the positive and mutually reinforcing linkage between competitiveness, sustainability and social equity, than to implement it. Several institutions are developing projects at the scale of micro-regions to attempt to bridge this gap, because it is at this level that it is possible to operate simultaneously on variables that have an influence on all three objectives (INDAP, 1994; Namdar-Irani and Quezada, 1994).

Developing Broad Systemic Competitiveness

Most of the new generation approaches cover all the relevant links in the chain that is required to produce the product and take it to the intended buyer at the appropriate time, in the required volumes, with the demanded quality specifications, and at a competitive price.

Thus, for example, Chile's PROCAMPO S.A. is implementing programmes to provide its small-scale vegetable suppliers with a range of different top-quality technologies, from seedlings to transplanters, to portable drip irrigation systems, to new packaging materials, to low-cost cold storage. The issue at hand, according to the General Manager of this peasant-owned firm (P. Rioseco, pers comm), is that no single variable can be left out if their products are to maintain the quality that allows them to hold a privileged position in a demanding and sophisticated market.

Contract agriculture, linking small-scale farmers with specific agroindustries, creates a promising channel for accessing international markets which are highly competitive and demanding in product specification and quality (de Janvry, 1994) (Box 3). Agroindustry presents three characteristics which make it particularly valuable for the purpose of strengthening small-scale, family-based agriculture (Schejtman, 1994):

- (a) Greater flexibility than other industries in the scales or magnitudes of the required fixed-capital investments, which allows for a greater range of options of size adjustments to fit with the size and resources of the local units with which it must become integrated;
- (b) It allows for the integration of capital-intensive and labour-intensive processes, especially in the agricultural activities that supply the raw materials or primary inputs for the agroindustry;
- (c) Agroindustries impose production calendars, volumes of production and quality specifications, and, through them, they can play an integrative and organising role of those units which are its direct or indirect suppliers.

Production systems which integrate agroindustries with small-scale agriculture are more competitive when the primary processes are very labour intensive per unit of land, and where mechanization is not an efficient option (Schejtman, 1994). This is because the opportunity cost of the small farmer tends to be lower than that of the capitalist sector. There is also a greater competitive advantage when the agricultural product is highly perishable so that it cannot be easily obtained in the open market; and when the raw input has a high cost per unit of volume so that transaction and transportation costs are of less relative importance (Schejtman, 1994). Thus the modern agroexport agroindustries (eg., vegetable and fruit products, flowers), followed by the modern agroindustries of basic agricultural products (eg., milk products, sugar from sugarbeets, animal feed), show the greater advantage from the point of view of their potential to generate technical progress in small-scale, family-based agriculture (see Box 3).

Box 3. Asparagus Production By Small-Scale Farmers In Peru

In terms of value, asparagus in 1990 was Peru's most important vegetable crop and, by far, the most important non-traditional agricultural export (CEPAL, 1993).

In one of the most dynamic asparagus regions, Piura, 47% of the crop acreage is under the control of small-scale farmers, with less than 3 ha each. The majority of the minifundista peasants used to plant between 0.5 and 3 ha of basic crops, such as cotton, rice, corn and grain legumes, facing severe problems of shortage of irrigation, obsolete technology and lack of access to technical assistance and credit. For these farmers, the new crop meant new development alternatives which substituted or complemented their traditional crops. Despite the fact that asparagus is a foreign crop in their farm systems, it represents a safer market and more stable income. Also, asparagus production implies access to financing, training and technical assistance.

In 1986, a group of businessmen linked to the mining industry, decided to explore new investment options in the agroindustrial sector in Piura. Two corporations were formed to set up the project, which started with an adaptive experimentation project on 2 ha., with the cooperation of CIPA, an agency of the Peruvian Ministry of Agriculture. A scheme was set up in which the Agrarian Bank of Peru (BAP) would make long term loans to start new asparagus plantations to all those persons that had previously signed production contracts with the new agroindustry. Given the social orientation of BAP, it promoted the new crop mainly among land-poor farmers. Technical assistance was obtained from an important Dutch firm. Soon, two other agroindustries started operations in Piura to buy asparagus from local small-scale producers.

However, it is important to underline that the search for export-oriented and agroindustrial opportunities for small-scale farmers does not preclude the competitive production of staple foods for the regional and national markets as a convenient platform for effective development (de Janvry, 1994). As a matter of fact, this may be the best option to open access to economically feasible alternatives to peasant communities that lack the natural, capital and infrastructure resources required to produce for the international markets or the agroindustries (Box 4).

Box 4 Marketing Field Beans in Chile

Several regional organisations of small-scale farmers, together with a private trading firm and with the technical and financial support of the Agricultural Development Institute (INDAP), have implemented an innovative marketing system to improve the competitiveness of peasant farmers in the national and international markets.

markets (Tello and González, 1993; Tello and Rojas, 1994). This mechanism has operated in two consecutive seasons (1992-93 and 1993-94) and has been approved for a third one (1994-95).

In the first season, four organisations representing 1 880 small-scale farmers, in three of Chile's 13 regions, signed an agreement with a private trading firm and INDAP, to improve the marketing of field beans and garbanzo beans. The agreement included guidelines for the following processes:

- Preparation of storage facilities and personnel, indicating the minimum facilities that each organisation had to have in place to participate;
- Common quality and sanitary standards, and product specifications and a common sack and logo;
- Buying criteria and procedures: the trading firm faxed daily national and international price reports to each organisation and each of them calculated the daily buying price by subtracting their costs and operational margins. In this way, the price that farmers received was finely tuned to the market tendencies;
- Selling criteria and procedures; each day each organisation informed the trading firm about the volume of beans in storage. Since the quality was homogeneous across regions and organisations, the trader could add all the individual volumes into a larger package. After that, the trader would contact the main six or seven bean exporters and have them bid for the product in storage; the offers could vary significantly among exporters, as also could the form of payment and transportation conditions. The trader would choose the best offer and fax the information to the organisations, each of which would ship their lot to the agreed port and prepare a separate invoice to obtain their payment directly.

The export firms found the system very convenient since it guaranteed that the quality and volumes ordered would be exactly those received, something not always possible when they dealt with the traditional or informal-market intermediaries.

During the second season (1993-94) the system was extended, with 12 290 farmers now represented. With an extensive network of 34 local organisations, the system affected national prices by introducing competition and minimum prices in almost all the major bean producing regions.

In the first season, the prices that farmers received were 18% and 40% higher than those paid by the traditional intermediaries for field beans and garbanzo, respectively. In the second year, the differentials were smaller since most intermediaries were forced to match the minimum price offered by the organisations, but there was a 23% jump in field bean prices in the week that the programme started operating during the second season. In addition to the price differentials obtained by farmers, the organisations made a total net profit of US\$ 79 979 in the second season. Finally, INDAP negotiated two new decrees with the Internal Revenue Service which meant that traditional intermediaries could not avoid paying their taxes and adding the 18% legal value to the payments they made to the farmers. In short, in this system all players won, with the exception of the traditional intermediaries.

It is also important to note that Thrupp (1995) and other authors have studied some of the negative side effects of development strategies based on non-traditional agricultural exports (NTAEs). Some of these problems are:

- *The use of very high levels of pesticides in most of these NTAEs, coupled with relaxed, non-existent or non-enforced safety regulations, has led to increased health and environmental impacts of agriculture.* While this is undoubtedly true, it is important to notice the growing importance of organic or low input non-traditional exports; this is a tendency that should increase as consumers in Europe and North America demand safer products. Also, the urgent issue of adequately regulating the use of pesticides and other dangerous agricultural inputs must be addressed as an objective in itself, and not linked to a specific subsector. Many of the most important cases of misuse of these products leading to serious health and environmental damages have taken place in traditional agricultural and livestock sectors. Finally, it is important to mention that the total amount of pesticides applied in countries where NTAEs are important, such as Guatemala, is negligible when compared to the usage in the USA, even on a per hectare basis. However, it is necessary to stress that the growth of NTAEs requires a comparable investment in developing safer production and post-harvest technologies and efficient regulatory systems to monitor the use of inputs such as pesticides.
- *The opportunities to become involved in NTAEs, and the profits of such participation, are largely concentrated in the hands of large national and foreign agribusinesses, leaving out poor farmers.* Of course this is true, but it is a characteristic of almost any major and dynamic sector of the economy in Latin America (and perhaps also in Europe and the USA?). Because of the huge investments and know-how required to compete in these non-traditional markets, contract agriculture is a reasonable and viable option for small scale farmers to become involved in these profitable enterprises. To disregard this option would restrict these farmers to crops and activities whose profitability is decreasing (eg, small grains). It is important to point out that NTAEs have had a huge impact in opening very large labour markets for rural women, and that in the long run this will have a very positive social and political effect in many Latin American countries. Most significantly (as many of the examples in the Boxes show), small farmers in many cases are participating in these new markets in a highly organised fashion and not as isolated individuals; the hundreds of hectares of non-traditional crops being grown and marketed by the 1600 members of the Cooperativa Cuatro Pinos (Box 5), or the 4000 metric tons (4.3% of the national total) of dry beans marketed in 1995 by a consortium of 34 small farmers' organisations in Chile (Box 4), cannot be dismissed in the marketplace. The issue of the organisation of small farmers is discussed in more detail later in this paper.
- *NTAEs destined for rich foreigners displace crops which are important to achieve national food security.* There is no strong or conclusive evidence supporting this claim. Chile, for example, managed to increase vastly its non-traditional exports and at the same time become almost completely self-sufficient in the major crops and animal products produced in that country. The Guatemalan small farmers growing 70 000 ha of small crops have essentially maintained their maize and beans while growing an average of 0.5 ha of non-traditional crops (see Box 5). In addition, it can be argued that the

income received from that half hectare can pay for technologies that will reduce risk and improve yields in the traditional maize/beans fields, and also that it may reduce the pressure to grow these crops on fragile slopes, thus contributing to reduced erosion and deforestation.

- *The markets of NTAEs are highly unstable.* It is difficult to generalize; for example, the market size and price fluctuations of macadamia nuts are not the same as those of table grapes or cauliflowers. Even if the argument was true across the board, and since the markets for the traditional Latin American exports have also been very volatile in the past, agricultural diversification would seem to be an intelligent strategy, both at the national level and at the level of the Guatemalan peasant family whose income today does not depend exclusively on the price of beans or maize. Global trade liberalization and the elimination of the huge subsidies to agriculture in Europe, the USA and Asia, are the long term solutions to international market distortions that are being promoted by Latin American countries.

Box 5. Non Traditional Export Crops in Guatemala's Highlands

The Guatemalan highlands were traditionally dominated by small and medium size crop and beans farms, oriented towards the internal market (CEPAL, 1994). However, between 1979 and 1993, non-traditional export crops grew 90.9% (an annual average of 6.5%, more than double the rate for the agricultural sector as a whole), to reach a total area of almost 70 000 ha. Macadamia nuts, mango, okra, broccoli, minivegetables, and strawberries are among the crops which are planted by approximately 140 000 small-scale farmers in average plots of only 0.5 ha. Yields have consistently improved in the last 14 years, with increases that usually range between 80% and 112%. A recent study concludes that "Even though this new generation of farmers have maintained their minifundista production system, their capacity to innovate made them modernize their production marketing processes... the small and medium size of the production units was no impediment to their rapidly achieving high levels of competitiveness in the international markets. Their ability consisted in specializing in a given crop to obtain high productivity and quality levels..." (CEPAL, 1994).

The case of the Cooperativa Cuatro Pinos in the state of Sacatepéquez (altitude 2000 m) is considered a paradigmatic example of how small-scale farmers can achieve high levels of international competitiveness. The Cooperative was formed in 1979 by 1600 indian minifundistas to help in the reconstruction of their village after a major earthquake. In 1981, with support from Swiss agencies and from the Guatemalan government, they started a small dehydrating plant to improve the marketing of their traditional summer vegetables. By 1983, they were exporting fresh vegetables, having built extensive cold storage facilities. The Cooperative today runs complementary operations, including their own research, technical assistance, credit and rural infrastructure programmes.

Projects need to be designed to accommodate different and changing types of demands, due to the heterogeneity of peasant households and their income

strategies (de Janvry, 1994). In particular, it is important that the new generation projects avoid narrowly defining their area of interest to the issue of agricultural development, neglecting the potentials offered by the development of linkages with industries and services, including microenterprises.

Learning To Build Strategic Alliances With New Partners

It is not conceivable that a single agricultural research or rural development organisation can develop the required expertise to understand and act effectively in all the areas described above. Moreover, the diminished ability of the public sector to act as direct provider of such services as credit or marketing infrastructure, implies that increasingly the private sector will need to be involved in farming systems research and development projects.

The consequence is that agricultural research and rural development organisations must learn to build inter-institutional strategic partnerships.

In Mexico there is a vast experience in the development of this kind of partnership. The Mexican Ministry of Agriculture and Hydraulic Resources (Suárez, undated) has registered 142 associations in participation. These have helped to start joint ventures between farmers and different types of businesses in agriculture, livestock, horticulture and forestry, involving about 15 000 farmers and 40 000 to 50 000 hectares (Box 6).

Box 6. The Vaquerias Contract of Association in Participation, Mexico

One of the best known Mexican Asociaciones en Participación involves 400 farmers and the large agroindustrial complex GAMESA (Suárez, undated). GAMESA contributed US \$6 million to finance large investments in irrigation works, machinery and technology. The Mexican government, through a debt swap scheme, placed another US \$6 million to finance the farmers' capital contribution to this contract. A specific corporation, DICAMEX, was formed to manage the project.

During the first year, the farmers contracted 2 500 ha of beans (first crop season) and 3 500 ha of wheat (second crop season). The contract was signed for 12 years or 24 cropping cycles and at the end of this period the farmers will have an option to buy back the equipment at 25% of their original value. Profits are divided equally and farmers can obtain cash advancements during the season. If no profits are obtained in one season, the farmers are still guaranteed 8% of the gross value of their crop.

The adjustment will be more difficult for agricultural research institutions than for rural development organisations because the former have had a historic difficulty in linking the issue of technological innovation with that of agricultural development. Moreover, there is a strong tendency in many research circles to see this line of thought as an unwanted and harmful intrusion in the essence of scientific undertakings. This will remain a problem unless it is understood that the question is not that of scientists leaving research in order to undertake other tasks for which they are not prepared and trained, but one of orienting research in response to the

demands of clients and of learning to work in close contact with other agencies and organisations that can provide the goods and services that are required for effective technological innovation.

Flexible Projects For Permanent Innovation

Economic, social and technological developments in the new scenario of Latin American agriculture are much more dynamic than in the past. Institutions and projects must be equipped to work in this context of rapid changes.

The new generation of projects tend to be demand-led. Here, innovation processes; mechanisms for rapid adaptation to changing conditions; agile access to services; and strong, effective, functional organisations of producers are as important products of a project as the technological product itself.

To achieve this, an understanding is needed of the relationships between macro and micro variables, and capabilities of farmers' organisations and of research and development institutions must be built to research long term market and technological tendencies, to capture new development opportunities that arise from them and to react to unforeseen circumstances that may affect the results of the project.

Moreover, it is unavoidable that many of the new initiatives will fail to succeed in an environment of increased competition and downsized government intervention. In the USA, for example, only two of each five new small firms manage to implant themselves successfully in the marketplace (V. Budinich, pers.comm.). To deal with this implication of the new socioeconomic scenario, farmers' organisations and research and development institutions will need to develop in ways that we are only starting to foresee.

Developing Permanent Capacities In Local Communities

Successful peasant development initiatives always involve organised groups of farmers, because individual and isolated small-scale farm systems cannot expect to become competitive in the new scenario. Functional farmer organisations are required for peasant producers to achieve economies of scale, to have access to goods and services under adequate conditions, to negotiate with buyers of their products and improve their marketing systems, to implement high quality management services that are indispensable in this age of great competition, and, in the end, to capture a greater share of the benefits of their productive activity.

A new 'organisational technology' must be developed for this purpose. Fortunately, in many countries it is now common to see innovative schemes in which governmental and non-governmental organisations work together in the design and implementation of agricultural research and rural development projects (Bebbington et al., 1993).

For example, NGOs in Chile are contracted by the public extension system to provide this research and rural development service to close to 40% of attended peasant families. In Colombia, joint farming systems research programmes are carried out between NGOs, the national agricultural research institute and an international agricultural research organisation. In Ecuador, NGOs are implementing adaptive

research programs to fill the gap between the research conducted by the public sector institutions in the experiment stations and the small farmers' conditions. In Bolivia, local agricultural experimentation centres were developed by NGOs and later, agreements were established with the governmental research institutions to manage and operate them jointly.

While this tendency for greater public-NGO cooperation is not without problems and limitations, since almost all NGOs work through some form of collaboration with local or regional farmers' organisations, these schemes have in effect brought public agricultural research institutions closer to dealing with organised groups of peasants.

There are specific issues concerning functional farmers' organisations that still need to be better understood and that deserve greater attention. It is a complex transition between more or less informal local groups of farmers and well-structured farmers' organisations capable of operating as efficient providers of goods and services. However, unless we can advance in this direction, small scale farmer development will always be dependent on external funding, management and technical support, and we know well that that is a sure prescription for frequent failures and frustrations.

Conclusions

In summary, there are many lessons to be learnt from the recent innovative and creative responses to the new economic scenario facing Latin American agriculture. Although most of these new initiatives are relatively young, and while many of them will undoubtedly face difficulties and even failure, it cannot be questioned that through these activities some farmers' organisations and some research and development institutions are breaking new ground and learning to work in a difficult new world. In doing so, they are probably helping us avoid the fate of those that insisted on becoming the best, most efficient and most productive makers of steam engines after the invention of the internal combustion process.

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