Area: Latin America
ARI 111/2008 (Translated from Spanish)
Date: 10/11/2008

Argentine Agricultural Scene: Recent Changes, Future Challenges and Latent Conflicts (ARI)

Roberto Bisang [*]

Theme: Thanks to its inherent potential and recent technological and organisational changes, Argentina's farming sector has developed the capacity to generate major revenue from abroad. This forces a re-think of how and why the government intervenes (among other ways, by taxing exports) in the process of appropriating such excess production.

Summary: The Argentine agricultural sector recently changed the way it works, transforming itself into a network of landowners, companies that carry out farm work, providers of inputs and services and even industrial manufacturing, all of them interconnected by a wide range of contracts. On the basis of this system (similar to the one that supports Argentine industry) and facing strong demand (domestic and from abroad), a major technological revolution has occurred (involving the use of transgenic seeds, direct sowing, etc) which has doubled production in just a few years. Through adequate macroeconomic conditions, this triggered a robust flow of revenue and subsequent tensions over who gets what share of it. This process has seen the involvement of not just the State –through taxes on foreign trade – but also the various companies that make up the network (from the farm sector itself, services, industry and technology). Now up for debate on Argentina's social agenda is its model for accumulation of wealth, growth and development for the next few decades.

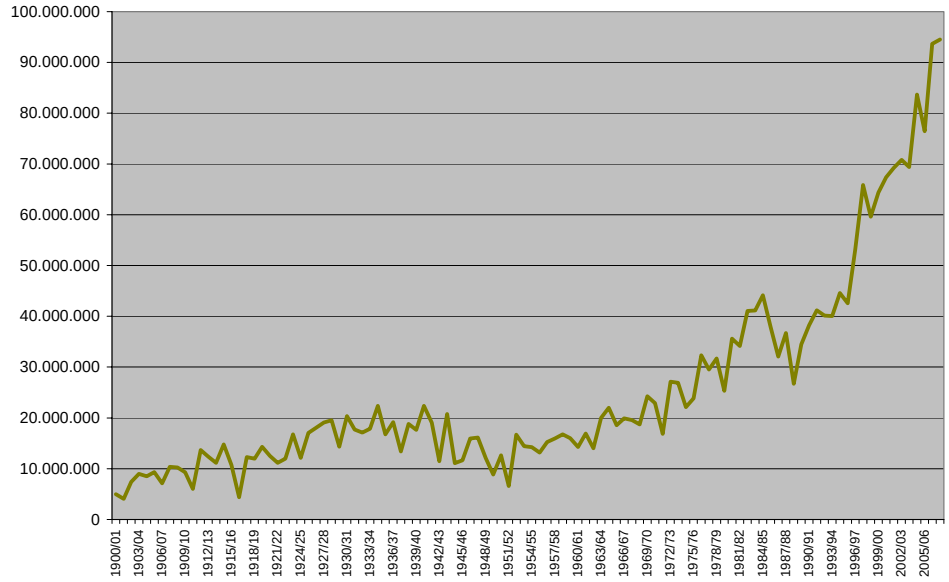
Analysis:

Reinventing Agriculture in Argentina

Argentina's economic development is closely linked to its use of natural resources. Several of these resources have taken on heightened economic value of late. This has resurrected old questions about the dynamics of using such resources and their relationship with processes of accumulating wealth, joining the international economy and growth. Agricultural is a paradigmatic case. A long-term view allows us to evaluate the recent surge in production.

[*] *Economic Commission for Latin America and the Caribbean (CEPAL), Buenos Aires office.*

Graph 1. Evolution of Argentine production of grain and oleaginous plants (in tons)



Source: the author, with data from the National Grain Board (1975) and SAGPyA (2008).

After a period of certain passivity, since the early 1990s production of grain and oleaginous plants has grown at an annual accumulated rate of 5.7% in physical terms. A good part of this expansion stems from the growing importance of oleaginous plants and in particular soy (in general terms it accounts for half of all production). The role of this crop is even more important if we consider the duo of soy and wheat (nearly two-thirds of the total).

The expansion did not come at the expense of other sectors –such as dairy production and/or livestock– that compete to use land. Aside from the fact that their activities were relocated, physical production of meat and milk both showed a certain degree of resilience. In this last category, the past 15 years which have been studied show that production grew until 1999. Then came three years of decline and crisis, followed by a period of development from 2002 that brought production to levels similar to the highest on record. Meat production also showed a certain dynamism in terms of production, especially starting in 2002. Even though advances in agriculture ended up taking land away from livestock breeding, (the livestock industry is estimated to have gone from using 8 million hectares of land to just under 5.1 million in about a decade), Argentina's livestock herds grew slightly and meat production in recent years is amongst the highest levels on record.

Farm (and food) production became a highly dynamic activity with an increasingly powerful role in the national economy. In just over a decade, farming and livestock nearly doubled their contribution to gross production value, reaching nearly 7%. If one adds the sector of Food, Beverages and Tobacco, the figure goes up to nearly 17% of global GPV.

Agricultural products account for more than 55% of Argentine exports. Oleaginous plants alone –soy and sunflower– represent nearly 25% of all exports. Rises in international prices for such products and a favourable exchange rate prompted the government to impose taxes on farm exports, and this showed up on the government balance sheet: such taxes account for nearly 8% of all tax revenue. The farm sector also has a positive effect on employment: conservative estimates say it provides 18%-22% of all jobs in Argentina, and 35% according to a broader view. A long-term view shows that agriculture has been quite dynamic, given its substantial contributions to Argentina's GDP, trade surplus, tax collection and even employment.

The Keys to Argentina's New Agriculture Scene
What are the keys to this surge in production? Even though production doubled in less than two decades, the amount of land used for farming expanded by far less (rising from approximately 20 million hectares to 24 million, which 'expands' to nearly 32 million because of the practice of sowing two crops a year). So if we rule out greater land use, the causes of the greater production are the following two:

- How the system is organised.
- The (associated) model of generating, adapting to and spreading innovations (production per hectare also grew: 55% in the case of maize, 23% for soy and 16% for wheat –comparing the first five years of the 1990s with the last five–).

Organisation: Production Networks
The earlier production model was based on possessing (or renting) land in order to carry out a series of activities that were highly integrated and capital-intensive. The farming itself was carried out by thousands of producers who operated in a cyclical business, with high levels of risk from the weather and commercial factors. Crises often prompted government intervention to sustain minimum levels of profitability and/or, in other cases, impose taxes on foreign trade and thus tap surpluses that emerged randomly due to factors that that had nothing to do with farming itself (currency devaluations or rises in international prices for agricultural goods).

How is the Argentine agricultural system organised these days? More and more, and for the most important crops, new economic players (with their respective roles) are joining in production and forming networks characterised by:

(1) A growing separation between landowners and companies that actually farm. This establishes, and/or recreates, the role of contractors as dynamic forces in this model. Added to this is a long list of suppliers of services and/or industrial inputs; they reflect the complexity of new agricultural technology. As a result of all this, the Argentine agricultural system is no longer so vertically oriented; it outsources production, forming networks of subcontractors (similar to suppliers in the chain of production in industry).
(2) Greater sophistication in processes designed to boost yields, lower costs and ensure quality. This sophistication comes, via inputs, from the industrial system. More and more, it is serving as a supplier of technology. In other words, agriculture is incorporating industry as a relevant part of its own process.
(3) Many subcontractors are based in areas other than where they operate. There is a separation between the place where production is carried out and the territorial base of those carrying it out (as a result, this is the space in which the multiplying effect of

agriculture is detected). Argentina's 'new' agricultural system is relocating across the country's territory.

The different players involved in the system must all chip in: the commercial success of each and every one depends on the sector itself succeeding. In this way the Argentine agricultural sector has been fine-tuning an organisational system that incorporates and generates new companies, improves collective efficiency in the use of resources and changes the existing mechanism for sharing out revenue.

Innovations in the Argentine Farm Sector

The flip-side of the production model is how the sub-system for generating, adapting to and spreading innovations is organised into a network. In the 1960s and 70s, as part of the so-called green revolution, Argentine farm and livestock producers incorporated –albeit late and with imperfections– advances like mechanisation, the use of fertilisers and biocides and hybrid seeds. Later, the wide-scale introduction of soy crops and the onset of direct sowing[1] to replace traditional techniques paved the way for adopting future technologies. The first transgenic seeds were introduced in the 1990s. The possibility of turning to genes and biotechnology advances (which came from abroad), and being able to rely on local seeds that were highly compatible with local weather conditions and soil facilitated the emergence of a new technical scheme. Two other elements were added at the same time: (1) local availability of machinery and processing technologies for direct sowing; (2) abundant supplies of biocides and fertilisers (on terms similar to those prevailing in international markets).

The incorporation of these technologies transformed the model that had consolidated over previous decades. It took agriculture into a new phase of brisk technological change, linked to the early international adoption of certain key inputs (transgenic seeds and direct sowing). The new technological scheme was adopted and adapted by Argentine society not longer after it was launched internationally.

Throughout this process, an innovative approach took shape. Unlike the previous system –in which changes, knowledge and technological decisions were centred round the producer– in the new model many players take part. In terms of generating technologies, one highlight was the key role of seed suppliers (multinational companies that come from the chemical or pharmaceutical industry in alliances with breeders and/or local producers who were already established) with packages associated with complementary inputs (from inoculation equipment to herbicides, and even financing); another sector that underwent a face-lift was that of farm machinery, which introduced new equipment and improvements to existing features (by incorporating electronics to metal-machinery). At the same time, formal educational systems (universities, etc.), although in different ways and at varying paces, are adapting their curricula to train young people in line with the new advances. In a complementary fashion, government institutions working in science and technology (the National Institute of Agrarian Technology –INTA in Spanish– as well as other research institutes and universities) serve to generate pre-competition technologies that eventually make their way into the system. Besides getting help from the government, the spread of innovations –guided mainly by the profit motive– is aided by other economic forces: (1) customer service centres at input suppliers, whose national networks not only sell products but often end up giving consulting services; (2) private,

1 A process that allows seeds to be planted without stirring up the soil (ploughing, harrowing, sowing, harrowing) and with a significant cut in costs, improved maintenance of soil and utilisation of moisture.

non-profit-making institutions dedicated to encouraging and/or developing innovation (such as the Argentine Association of Experimental Farming Consortia –AACREA– andr the Argentine Association of Direct Seeding Producers –AAPRESID–); (3) new (and/or reformed) associations which are organised as production chains and address technological challenges as one of their main goals (Argentine Sunflower Association –ASAGIR–, ACSOJA and MAIZAR); (4) contractors; (5) quality control rules imposed by industrial customers and exporters; and (6) updated government intervention (Argentine and international) related to the standardisation of products, processes, environmental and other complementary regulations which also indirectly shape the innovative development of farming.

A network of innovation was gradually formed, bringing together institutions, companies, individual operators and even labour unions**.** They established a series of relationships characterised by a flow of knowledge, either codified (via inputs) or uncodified (through consulting and/or direct contact)**.** The growing sophistication of the agricultural system transfers some decision-making power from producers to input and machinery suppliers, sub-contractors, scientific, technological and labour organisations and even 'downstream' buyers. Again, there is a common, driving force which, with varying nuances and densities, determines the actions of the network's components: individual success depends on the success of the group as a whole.

Generating Income, Taxes on Foreign Trade and Conflict
With these structural changes in place, over the past two years Argentine farm production rose in response to strong external demand: for food, bio-fuels, bio-mass and even the use of grain as an asset for investors to speculate with. Prices on the international market increased, generating more income for the agriculture sector.

As far as Argentine society is concerned, the issue of higher demand and rising exports has several sticking points: (1) it affects domestic food prices and hinders the process of improving distribution of income; (2) it involves a possible source of financing for development (and/or a fiscal boost for repaying foreign debt); and (3) it forces a review of the distribution of wealth (through a significant re-evaluation of assets related to the very basic issue of the price of land). At a private level, each and every component of the production network try to grab their piece of the pie in a process with many and varying financial, economic, technological and even information-related asymmetries.

As international prices for farm goods rose, the government changed its policy on taxing exports. Initially, in a bid to control domestic prices, mechanisms were created to lower the prices of wheat and maize, depending on whether they were for local consumption or export. The idea was to set up a complicated system of compensation for other food and agriculture activities that use wheat and maize as inputs (milling, poultry production, feed lot meat production, etc). For dairy products and meat, initial taxes on exports (around 15%) were followed by restrictions on the volume that could be sold abroad. Furthermore, export restriction values for oleaginous plants, which are hardly consumed at all in Argentina, were initially set at 13%. This later went up to 23.5%, then to 27.5% in early 2007, and in the middle of that year the figure rose to 37.5%.

Within the production network, there were also changes. Prices for key inputs (herbicides, insecticides, seeds, silage bags, plastic etc) rose in line with prices on international markets (through a high concentration of supply in just a few multinational companies). Fuel prices slowly adjusted as well, as did some taxes (especially provincial ones or

others that are calculated on the basis of flows) and rental prices. The weakest links in the chain –small-scale operators and sowing pools, sowing service providers, etc– had less margin to get a share of the emerging revenue under these new conditions. As was to be expected, contractors who expanded through technological improvements in poorer areas were those hardest hit.

The price increases that occurred from late 2007 to early 2008 prompted the government to impose variable export restrictions (export restrictions that grow according to trade levels). These raised taxes to more than 45%, and even more depending on international prices. Farmers protested, touching off a social conflict that eventually led to the export taxes being annulled in parliament.

The reaction on the supply side reflected the structure of the production network. In those few cases where there is concentrated supply (fertiliser, herbicides, seeds, hybrids, silage bags) prices rose, accompanying expectations for international prices for soy. In the majority of cases, where there is a very competitive internal supply (some suppliers of non-concentrated inputs, service providers, contractors, small, integrated producers), this did not happen. So the system of variable export restrictions significantly worsened the economic equation and encouraged the conflict. All in all, in its effort to obtain a share of all the revenue, the government used a one-size-fits-all tool for the whole industry without considering the heterogeneous nature of the production network. An alternative would have been to use tax instruments that target the flow of resources and/or the level of wealth specific to each segment of the network.

The government action also had an unexpected negative effect: it destroyed the grain futures market and in doing so it (1) severely limited the possibility of financing through futures sales, (2) eliminated the prospect of extraordinary gains (the incentive that drives capitalism) and (3) introduced an extreme level of institutional volatility in a business that has long cycles of maturity and a system of organisation that is based on contracts. In other words, it affected a substantial portion of the basic structure underlying how the network functions. In less than a year, there were four changes in taxes on exports at different stages, from the decision to plant seeds to harvest time to the point at which a sale is made. The tension led to a farmers' strike that lasted several months and ended with Parliament rescinding the government measures. This did not bring, however, a medium- or long-term solution to the conflict over sharing out revenue or how it is to be used socially.

Conclusions: To a growing extent and for a variety of reasons, the Argentine agricultural sector has gradually changed the way it is organised internally. It has moved towards creating production and innovation networks based on relationships that go beyond specific commercial ties governed by prices. The new networks involve development of technical and productive capabilities that draw not only on individual productivity but also on the nature of the exchange links between the diverse forces that make up the agricultural sector.

Today this sector is displaying a vibrancy similar to that of the early 20th century. In the framework of a co-evolutionary process it has generated new kinds of entrepreneurs, forms of financing, relationships with industry and services (upstream and downstream) and even institutions. But in a local and international context that is in a high state of flux, this highly promising reality is just a starting point that will be thwarted if the weak points

of the system are not shored up and foundations are not established for permanent creation of future competitiveness.

Recent price increases in the international markets generated new income that was quickly absorbed by the most concentrated sectors of the network and by the government itself by raising taxes on foreign trade through variable export restrictions. Small- and medium-size companies dedicated to production and/or supplying inputs did not fare as well. The farm sector is an innovative and dynamic one that saw its expectations dampened and with this, its margin for operating in the future.

The variable export restrictions, besides doing a poor job of bringing in additional revenue for the state, jeopardised the Argentine farm sector's organisational model. The economic forces that make up the system rebelled in response to a reduction in absolute levels of income (and with it a cut in expected levels of revenue and prospects of rises in asset prices) and a change in rules that concern essential elements of the model. These include the terms under which contracts are reached and futures markets.

In light of the results, this tool –variable export restrictions– has proved itself inefficient when it comes to doing the following: (1) collecting part of the new, increased farm revenue and using it to help local prices break with international prices (and improve the distribution of revenue); (2) creating conditions for strengthening and deepening the development of agriculture (to move towards an agro-industry); and (3) having an effect on the taxes imposed on the real revenue collector (landowners) for the fixed asset (land) and at the same time maintaining price signs for the economic forces that make the network dynamic.

Argentine government policy lacked a systemic vision of the country's agricultural sector, and instead used tools more reminiscent of the old agrarian model than the current network-based system of production. For the parties to the conflict, what was absent in the short-term solution was a strategic vision, one that takes into account the vast potential that favourable international market conditions offer for enhancing a process of development that began after the crisis of 2000.

Roberto Bisang
Economic Commission for Latin America and the Caribbean (CEPAL), Buenos Aires office