Definitive trends for food systems in Latin America? The case of potatoes over the last half century and into the next

Gregory J. Scott, School of Graduate Studies

Universidad del Pacifico, Lima, Peru
scott_gj@up.edu.pe

Abstract

Despite being the center of origin for the potato, Latin America now lags behind Africa and Asia in annual output for the crop amongst developing country regions. This paper attempts to answer two basic questions: What were the principal trends in the growth rates for potato production, area, and yields in Latin America over nearly the last half century? In light of these developments, what are the prospects for the commodity in the region in the years ahead? After an analysis of FAO annual secondary data on regional trends in production, the paper identifies some key issues for future research.

Keywords: Growth rates, production, area, yields.

Introduction

Almost all but overshadowed by the events caused by the on-going global financial crisis, 2008 was the International Year of the Potato. And like the financial crisis, trends and prospects for potato production in Latin America is the outcome of years, if not decades, of developments within and related to the sector. With noteworthy exceptions, potato production has shown only modest growth or stagnated in many Latin American countries since the early 1960s. Hence, despite being the center of origin for the crop, Latin America now lags behind Africa and Asia in annual potato output amongst developing country regions.

This paper presents the results of an analysis of FAO annual secondary data to identify changes in growth rates in potato production, area, and yields in Latin America over nearly the last half century. One key theme is the extent to which the evolution of these growth rates foreshadows the most likely future scenario for potato production in the decades ahead.

Growth rates for production, area, and yields

Potato production in Latin America averaged 15.7 million metric tonnes in 2005-07—more than double the 7.2 million metric tonnes (mt) harvested in 1961-63, nearly half a century earlier (Table 1; CIP, 2008). This expansion in potato production resulted from annual growth rates of around 2.0%/yr for nearly the last 50 years. By way of comparison, growth rates for potato production in Asia and Africa averaged over 4% for the entire period, i.e. more than double those for Latin America (CIP, 2008).

For Latin America as a whole, area planted in potatoes shrank, albeit modestly, and at a slightly accelerated pace towards the end of the period 1961-2007. Producers harvested an average of 954,000 ha of potatoes during 2005-07 versus 1.02 million hectares in 1961-63 (CIP, 1999, 2008). More significantly, whereas three of the nine largest potato-producing countries in Latin America had negative growth rates in area planted in potatoes during the period 1985-87 to 1995-97 (CIP,1999), eight of the 11 largest potato-producing countries had negative growth rates in area planted in potatoes during the period 1991-93 to 2005-07 (CIP, 2008). In effect, the modest contraction in area planted in potatoes became more widespread throughout Latin America over the last two decades, thereby reversing positive growth rates for area planted from the early 1960s to mid-1990s in many, but not all of these same countries.

With area planted declining, growth in output of potatoes in Latin America has been driven by increases in average yields since the early 1960s with a few noteworthy exceptions. Growth rates for potato yields in Latin America, while uneven across the region and over time, have averaged 2%/yr for nearly the last 50 years. Growth

rates for potato yields in Africa (1.2%, -0.1%) and Asia (1.5%, 0.9%) for the periods 1961-63 to 1991-93 and 1991-93 to 2005-07, respectively, were considerably lower (CIP, 2008). Notwithstanding, growth rates for average annual yields have declined in recent years (Table 1) suggesting earlier projections for growth rates in production (1.72%), area (0.41%), and yields (1.30%) for the period 1993 to 2020 were too optimistic (Scott, et al., 2000).

Average yields—16.5 mt/ha during 2005-07 (Table 1)--remained higher in Latin America than in Africa (11.1 mt/ha) throughout the period, surpassing yields in Asia (15.5 mt/ha) only over the last decade (CIP, 2008). As area planted in potatoes continued to expand rapidly in Asia and Africa into the last decade, comparable improvements in average yields became more and more difficult to sustain in those regions at the same time. Something of the reverse process has been underway in Latin America, although with its own exceptions, as more of total area in potatoes is cultivated by more efficient producers. Partly as a result, average yields for potato in Latin America are now higher than those in the Russian Federation (12.7 mt/ha), the Ukraine (13.1 mt/ha) and nearly as high as those in Poland (17.4 mt/ha), but still lag far behind those in Western Europe (Germany, Netherlands) and North America (United States) (Ibid.).

Table 1. Average annual growth rates for food crops in Latin America, 1961-2007

Crop	2005-07			Growth rate (%)								
	Production	Area	Yield	Production			Area			Yield		
	(000 t)	(000 ha)	(t/ha)	1	2	3	1	2	3	1	2	3
Maize	97.402	27.702	3,5	3,2	3,0	3,1	1,0	0,3	0,7	2,2	2,7	2,4
Cassava	36.433	2.875	12,7	0,8	1,1	1,0	1,3	0,5	0,9	-0,4	0,6	0,1
Rice, paddy	25.316	6.001	4,2	3,1	2,0	2,5	1,9	-0,8	0,5	1,2	2,9	2,0
Wheat	24.845	9.235	2,7	3,1	0,8	1,9	1,2	-0,5	0,3	1,8	1,3	1,6
Bananas	23.293	1.158	20,1	1,8	1,7	1,7	1,1	1,3	1,2	0,7	0,3	0,5
Potatoes	15.901	981	16,2	2,2	1,6	1,9	0,0	-0,1	0,0	2,3	1,6	1,9
Sorghum	11.420	3.678	3,1	9,0	-1,1	3,8	6,0	-1,5	2,2	2,9	0,4	1,6
Tomatoes	10.856	342	31,8	5,3	2,9	4,1	2,3	1,0	1,6	2,9	1,9	2,4
Plantains,	8.407	979	8,6	2,2	1,9	2,1	2,5	1,4	1,9	-0,2	0,5	0,1
Beans, dry	5.598	6.785	0,8	1,5	1,3	1,4	1,8	-0,7	0,6	-0,3	2,0	0,8
Sweetpotatoes	1.983	242	8,2	-1,3	-0,1	-0,7	-0,7	-0,8	-0,8	-0,6	0,6	0.0

1 = 1983-85 vs 1961-63; 2 = 2005-07 vs 1983-85; 3 = 2005-07 vs 1961-63

Perhaps more than other developing country regions, average yields for potatoes in Latin America are misleading because of the differences in farm size within the sector in several, major potato-producing countries. While the vast majority of growers in Latin America plant less than a hectare of potatoes per growing season, large farms (i.e., 50-100 ha plus in potatoes) are conspicuous, if not dominate production in north and northwest Mexico (e.g., Chihuahua, Sinaloa) (Biarnes, et al., 1995), in central Venezuela, in parts of central and southeastern Argentina, central Brazil (Minas Gerais) and the central highlands of Colombia (Rodriguez, 1996). These larger growers can easily get yields that are two to three (or more) times the national average. Across the region, the lowest average yields are in those Andean countries, i.e., Bolivia, Ecuador, Peru (CIP, 2008) where potato production often takes place on postage-stamp sized, non-contiguous plots and involves the use of native varieties and low-input, risk-averse, production practices even with cultivating improved cultivars (Scott, 1985).

Concentration of output

Within Latin America, potato production and area planted are highly concentrated. For the years 1995-97, the five largest—Brazil, Peru, Colombia, Argentina and Colombia--accounted for 78% of output and 70% of area under cultivation (CIP, 1999). By 2005-07 and with 1.2 million more metric tonnes produced annually on average, the top five still produced 75% of all the potatoes and planted 65% of the all the area. They also accounted for 43% of the increase in production and 92% of the drop in area over the last decade. Chile, Venezuela and

Guatemala produced the bulk of the increase in output since 1995-97. Conversely, of the 32 countries in Latin America, 8 produce no potatoes and another six harvest less than 10,000 metric tonnes annually (Table 2). And unlike within Sub-Saharan Africa (e.g. Angola), no new major potato-producing countries have emerged in the region in nearly the last half century.

In the two most populous countries in the region—Brazil (pop. 192 million) and Mexico (pop.105 million)—average annual output rose by 19% and 22% respectively during the period 1995-97 to 2005-07 (CIP, 1999, 2008). In both cases, additional output was the net effect of declining area planted combined with more rapid and increasingly strong growth rates in average yields. Productivity increases resulted from more marginal growing areas falling out of production (for example, the state of Parana in Brazil) and the adoption of yield-increasing technology in the remaining areas (Mina Gerais) (Rodriguez, 2006). Alternatively, Brazil and Mexico produced more potatoes to enable only marginal increases in per capita consumption from the modest prevailing levels of less than 15 kg/capita/ annum respectively in 1994-96 (CIP, 1999) and in response to rising real incomes. Effective demand was for continued, albeit modest diversification of diets to include more potatoes and potato products.

Table 2. Distribution of developing countries producing potatoes by region, 2005-07

Average annual production metric tones (mt)	Region and number of countries				
	Africa	Latin America	Asia	Oceania	Total
0 or no data	16	8	5		29
<10,000 t	10	6	5	2	23
<50,000 t	8	5	2		15
<250,000 t	6	3	9		18
>250,000 t	14	10	17		41
Total	54	32	38	2	126

Source: FAOSTAT and calculations for this study.

Potato versus other food crops

Over the last nearly 50 years, the growth rate for potato production (1.9%) in Latin America has lagged behind that for maize (3.1%), rice (2.5%), sorghum (3.8%), tomatoes (4.1%), and plantains (2.1%) (Table 1). Of the 11 major food crops produced in the region, only potatoes (0%) and sweet potatoes (-0.8%) showed zero or negative growth rates in area planted. Nevertheless, in 2005-07, potato remained the sixth most important food crop in Latin America as in 1961-63 because of its relatively high growth rates in yields (Ibid.). However, whereas growth rates for potato yields were higher than for maize or rice in the 1960s and 1970s, by the 1980s that situation had reversed itself as maize and rice yields improved at an accelerating rate. Growth rates for maize and rice yields were particularly impressive as they occurred over much larger areas than potatoes and those areas continued to expand over time. Furthermore, the growth rate for potato yields declined even as that for area cultivated stagnated.

Both demand- and supply-side factors for potatoes and substitute crops contributed to these trends. For example, average annual potato output in Colombia fell from 2.8 million metric tonnes in 1995-97 to 1.8 million metric tonnes in 2005-07 (CIP, 2008). The arrival of the potato moth from Central America cerca 1985 eventually devastated the crop in the field. It also affected exports to neighboring Venezuela—declining domestic supply, meant fewer potatoes were available for export and at higher prices. Phytosanitary considerations dampened export demand further. Rising violence in the countryside and terrorist attacks in the city did little to reassure farmers or the associated suppliers of inputs, credit and technical assistance. Ambitious plans aimed at re-energizing the sector through greater collaboration between the various stakeholders (IICA-MADR, 1998; Martínez, 2006) has so far failed to turn the situation around.

In Argentina, output fell by 12% from 1995-97 to 2005-07 to 1.89 million metric tonnes (CIP, 2008). Average annual growth rates in area planted in potatoes have been negative since the early 1960s (CIP, 1999). With low producer prices for potatoes in 1989-90 in the face of growing economic attractiveness of producing cereals and oilseeds for export, the fall in area planted for potatoes accelerated (Moscario, 2004). Although production of potatoes for processing and exports of both fresh and processed potatoes to Brazil have risen sharply since then (Geunthner, 2001: Moscario, 2004; Rodriguez, 2006), they have been unable to reverse the long-term decline in area planted in potatoes (CIP, 2008).

Prospects for potatoes in the future

After 50 years of modest, but declining growth rates in potato production in Latin America, prospects for the next decade seem most likely to be a continuation of the same, long-term trend. After virtual stagnation in area planted in potatoes over the same half century, a massive expansion in area dedicated to the crop seems highly unlikely. Instead, probable increases in output are likely to result from continued improvements in yields, albeit at a declining growth rate and in response to modest increases in the total demand for potatoes.

Sources for the anticipated increases in potato productivity include accelerated access to information about existing technology, the generation of new technology and the gains from/ competitive pressures to innovate. Potato farmers in Latin America today have much more access to information about technology than they had in the 1960s, 1970s, and 1980s. One driving force for the spread of information has been the advent of the internet, electronic mail and the use of websites. Internet cafes, for example, are cheap and commonplace even in places where communication with the outside world was costly and time-consuming, at best, in the past. A second, related contributing factor to better access to information has been the spread of the telephone grid and the widespread availability and use of cell phones to say nothing of extension of all-weather road networks into heretofore isolated areas. With the expanding road network and improved access to markets, potato farmers have an opportunity to improve their competitiveness in traditional product lines and expand into emerging niche markets for new products (Ordinola, et al., 2007). It remains to be seen whether they can out compete other basic staples and broaden the appeal of niche products to achieve increases in overall consumption; or, whether gains in competiveness will be restricted to particular countries—or regions within countries, product lines and the bigger, more market-oriented growers. Under this latter scenario, the vast numbers of smaller farmers will continue to fall victim to the drive toward lower per unit production costs in response to pressures to produce more food at cheaper prices for urban consumers that make up an increasingly overwhelming proportion of Latin America`s total population (Scott, 2002; World Bank, 2007).

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