Structural Changes in Brazilian Agriculture: An Overview

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1. Introduction
The objective of this paper is to present some aspects of structural changes in Brazilian agriculture and the related industrial sector, mainly after the year 1940.

In the item 2 a short historical view of the country's development will be presented. Item 3 will approach the agrarian and the production structure. A few points will be illustrated about the industrialization and the agricultural modernization in item 4. Finally, item 5 will present some final comments.

2. Historical View
The official history of Brazil begins with her discovery by the Portuguese in year 1500. Since then Brazil has been a colony of Portugal until 1822, when she became an independent country. Concerning Brazilian Development we can observe it through some economic cycles as follows.

The first cycle is the cycle of "pau-brasil", from 1500 until around 1570, a period in which the abundant wood called pau-brasil has been exploited by the Portuguese. This exploitation of pau-brasil wood brought us the name Brazil.

In 1550 begins the sugar cane cycle, when Portugal decided to exploit the sugar cane plantation. This product came from Madeira Island in the Atlantic. This cycle ends around year 1650, when Dutch developed Central America into a relatively more competitive region of sugar cane production.

After the golden period of sugar cane, Portugal made a large effort to find gold and gems in the inland side of Brazil.

Then, after the discovery of some mines of gold and gems in the actual region of Minas Gerais State begins the mining cycle that goes from around 1690 until 1760.

Around 1820 began one of the most important cycles that is the coffee cycle. Coffee production was a pioneering industry in utilizing immigrant employees as labor force in a large scale. After 1850 the importing of slaves became prohibited. The economic importance of coffee is still high today, but in 1900 around 75% of Brazilian exports were comprised of this one product. This cycle continued until 1929 the year in which the price of coffee suffered a sharp fall and the country's capacity to import also fell down deeply.

As a consequence of the international banking crisis of 1929, the country began the first phase of industrialization in a import substitution system.

However, in the final of years 1960's Brazil tried to raise her income level through a new phase of industrialization in an export promotion view.

Today the industrial sector is greater than the agricultural sector, but both sectors have been dependent mutually, and one sector could not survive without the existence of the other.

3. Agrarian and Production Structure
Concerning the agrarian structure the number of farms that was around 1,904,00 in 1940 reached around 5,160,00 in 1980, showing an increase of around 170%, but the total area of these farms which was around
Table 1  Structure of number of farms, Brazil

<table>
<thead>
<tr>
<th>Size (ha.)</th>
<th>1940</th>
<th>1950</th>
<th>1960</th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10</td>
<td>34.40</td>
<td>34.40</td>
<td>44.80</td>
<td>51.20</td>
<td>50.30</td>
</tr>
<tr>
<td>10–100</td>
<td>51.20</td>
<td>51.00</td>
<td>44.70</td>
<td>39.30</td>
<td>39.10</td>
</tr>
<tr>
<td>100–1,000</td>
<td>12.80</td>
<td>13.00</td>
<td>9.40</td>
<td>8.40</td>
<td>9.50</td>
</tr>
<tr>
<td>1,000–10,000</td>
<td>1.40</td>
<td>1.50</td>
<td>0.90</td>
<td>0.70</td>
<td>0.90</td>
</tr>
<tr>
<td>More than 10,000</td>
<td>0.07</td>
<td>0.08</td>
<td>0.05</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Total (thousand)</td>
<td>1,904.6</td>
<td>2,064.6</td>
<td>3,337.8</td>
<td>4,924.0</td>
<td>5,159.8</td>
</tr>
</tbody>
</table>

Source: FIBGE.

Table 2  Structure of area of farms, Brazil

<table>
<thead>
<tr>
<th>Size (ha.)</th>
<th>1940</th>
<th>1950</th>
<th>1960</th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10</td>
<td>1.5</td>
<td>1.3</td>
<td>2.4</td>
<td>3.1</td>
<td>2.5</td>
</tr>
<tr>
<td>10–100</td>
<td>16.7</td>
<td>15.3</td>
<td>19.0</td>
<td>20.4</td>
<td>17.7</td>
</tr>
<tr>
<td>100–1,000</td>
<td>33.5</td>
<td>32.5</td>
<td>34.4</td>
<td>37.0</td>
<td>34.8</td>
</tr>
<tr>
<td>1,000–10,000</td>
<td>31.4</td>
<td>31.5</td>
<td>28.6</td>
<td>27.2</td>
<td>28.6</td>
</tr>
<tr>
<td>More than 10,000</td>
<td>16.9</td>
<td>19.4</td>
<td>15.6</td>
<td>12.3</td>
<td>16.4</td>
</tr>
<tr>
<td>Total (million ha.)</td>
<td>197.7</td>
<td>232.2</td>
<td>249.9</td>
<td>294.1</td>
<td>364.8</td>
</tr>
</tbody>
</table>

Source: FIBGE.

197,720,000 hectares (ha.) in 1940 became around 364,854,000 ha. in 1980, increasing only around 87%. It suggests that the land distribution is better today than in the past.

Tables 1 and 2 show a great increase in number of small farms of less than 10 ha., from 34.4% in 1940 to 50.3% in 1980, and in terms of occupied area they increased from 1.5% in 1940 to 2.5% in 1980, suggesting a certain improvement of land occupation by small farms. However, it is startling that the groups of large farms of more than 1,000 ha. which represent only 0.94% of total number of farms still occupied around 45% of the total area in 1980, although it has suffered a small decrease compared with the situation in 1940.

If we take the group of small and medium farms (less than 10 ha. and 10–100 ha.) we can note that the number of farms increased from 85.6% in 1940 to 89.4% in 1980, and the occupied area increased from 18.2% in 1940 to 20.2% in 1980. The increase in number of small and medium farms should have been fundamental for diversification of the agricultural production.

From the predominant extensive culture of sugar cane and coffee the country has been diversifying agricultural production, since the beginning of this century, mainly with cocoa, cotton, rice, tobacco, kidney beans, corn cassava and more recently soybean.

The most well succeeded example of a new culture is the soybean. Registered in official statistics only since 1952, this crop was introduced into the southern region, and has been diffusing gradually into other regions of the country. The southern region has been producing coffee, rice, corn and kidney beans traditionally, but in the years 1970's the soybean began to substitute large areas of the traditional cultures. This substitution has been due to two main factors: (i) a better profitability of the soybean (with a large foreign market) relatively to other products (typical for domestic market), (ii) the coffee plants affected by frequent frosts in the southern region. Consequently, the soybean production has shown a remarkable increase of more than 1,400% between 1970 and 1980, as we can see at table 3.

Another noticeable product in the recent periods is the sugar cane. After the first oil crisis in 1973 the country created a special program for increasing the alcohol production (in order to substitute part of the fuel utilize by vehicles). This program has stimulated still more the sugar cane production which has
been getting a large incentive from the international sugar market. As consequence, many regions have begun to substitute the areas previously utilized for products as rice and kidney beans to produce the sugar cane, especially in the Sao Paulo State. Then its production has increased more than 80%, while the production of kidney beans showed a small decrease and of rice presented only a relatively little increase.

### 4. Industrialization and Agricultural Modernization

Agricultural modernization had a big impulse in the second industrialization phase of the final of years 1960's, which was attributed to larger availability of modern inputs for the agriculture.

From table 4 we can deduce that the production of Nitrogen and Phosphorus had an increase of less than 80% between 1960 and 1970; but they grew sharply between 1970 and 1980 in more than 880%. On the other hand, the consumption of nitrogen, phosphorus and potassium showed an increase of more than 400% between 1960 and 1970, and of more than 300% between 1970 and 1980.

While the total area utilized for temporary and permanent cultures grew around 20% between 1960 and 1970 (in 1960 the area occupied around 28 million of ha.), and around 46% between 1970 and 1980, the consumption of chemical fertilizers have increased in a much more rapid rate as above mentioned. It suggests that the farmers have raised enormously the average consumption by area of fertilizers after 1960.

Mechanization also has been present in this modernization process, supported by an increasing availability of agricultural machines in the domestic market. Taking the case of agricultural tractors, we can deduce from table 5 that its consumption increased around 10% between 1960 and 1970, but it increased more than 260% between 1970 and 1980. By comparing these rates with rates of the utilized area for agricultural production, we can conclude that in the period between 1970 and 1980 the average consumption of these tractors by area has increased significantly.

Concerning agricultural production by area, in general there have been a certain increase in the recent periods, except the kidney beans which has suffered a light decrease, as shown by table 6.

The decrease in the productivity of kidney beans, which is a typical product for domestic consumption, has generated some criticisms...
against the government. Such criticisms have tried to blame the large governmental support to exportable products (as soybean) and those for generating energy (as sugar cane) in detriment of products faced to domestic food market (as kidney beans).

Although the government has allowed some additional supports to the exportable products and the energy generating agriproducts (through an additional research service and financial support, for example) compared with some products like kidney beans, the problem is that these beans has been losing competitiveness to other products because of, at least, two factors: (i) restricted market and (ii) its harvest could not be easily mechanized. Then its production has been generated basically by small farms and in less developed areas, in general with a relatively low technological level, and so it has probably been one on the most important reasons for the fall in the productivity shown in table 6.

5. Final Comments

The present paper tried to analyze some relevant aspects of changes in the structure of Brazilian agriculture from 1940 until the beginning of years 1980’s.

We could conclude that there have been changes in the structure of the country’s agriculture in terms of increase of the number of farms, and also that it has become relatively more modern, although with some exceptions.

Finally, I would like to observe that the agroindustrial sector, i.e. the processing sector of agricultural products, should have increased, mainly after the latter part of the 1960’s, and that this sector should receive additional incentives in the future.

References

1. Aguiar, Ronaldo Conde 1986 Abrindo o Pacote Tecnologico, Polis e CNPq.

Table 6  Productivity of some agricultural products, Brazil (kg/ha)

<table>
<thead>
<tr>
<th></th>
<th>Kidney beans</th>
<th>Corn</th>
<th>Cotton</th>
<th>Rice</th>
<th>Soybean</th>
<th>Sugar cane</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973–1975</td>
<td>638</td>
<td>1,393</td>
<td>886</td>
<td>1,514</td>
<td>1,440</td>
<td>38,761</td>
</tr>
<tr>
<td>1982–1984</td>
<td>516</td>
<td>1,565</td>
<td>1,144</td>
<td>1,764</td>
<td>1,531</td>
<td>52,044</td>
</tr>
</tbody>
</table>

Source: FIBGE.