

**INSTITUTE FOR APPLIED RESEARCH IN SUSTAINABLE ECONOMIC  
DEVELOPMENT-IPADES**

**CASSAVA CAN CONTRIBUTE MORE TO THE ECONOMY OF PARÁ**

*Francisco Barbosa*

Associate President-IPADES

In all plants, most of the carbon fixed in photosynthesis is used for the formation of carbohydrates, mainly *starch* and *sucrose*, which are more stable products of photosynthetic process. The carbohydrate portion thereof can be exported in the form of photosynthetic cells of sucrose or be accumulated on own chloroplast in the form of starch, the main carbohydrate reserve of higher plants. The practical interest by studies of metabolism of carbohydrates comes increasingly widened in recent decades, due to the possibility of creating transgenic plants more efficient in the synthesis and accumulation of the carbohydrates, that can be used as raw material (starch) or biofuel (ethanol). Cassava (*Manihot esculenta* Krantz) fits perfectly in this biological context. It is an important source of starch, and an agricultural product with greater agriconsumption.

The world's largest producer of cassava is Nigeria with 45.1 million tons/year. The Brazil is the second in this ranking with 25.5 million tons/year. Pará leads national production with 4.5 million tonnes in 2009. The value of its production, 662.1 million reais in 2007, puts it as the second product of the agricultural paraense economics behind the livestock. Paraense productivity is 16 t/ha, 50% less than that achieved by Paraná, second national producer. The chain of production of cassava in Brazil moves around US\$ 2.5 billion, generating proceeds of US\$ 150 million.

Among the ten municipalities with the highest production, six are from Pará. Acará with 720 thousand tons/year is the largest national producer. Belém is the municipality of higher consumption of cassava flour, with 34 kg/person/year. The production of cassava, in Pará, is basically intended for the production of flour, complemented by tucupi and maniva (crushed leaves), both used in paraense cooking.

However, the starch is the noblest product extracted from the root and its use is in more than a thousand threads, as in the food industry, plastics, pulp and paper, textile, metallurgy and petroleum extraction. Cassava can extract alcohol, which is already being used as fuel in China, Thailand and Viet Nam. However, the cassava as feedstock for the production of starch and/or ethanol depends on important points to be

observed to have access to these respective markets: a) agronomic knowledge; b) volume and cost of production; c) ease of obtaining; d) industrial income and cost.

Although holds the leadership of national production of cassava, Pará has not been able to get higher socioeconomic gain this segment because of problems existing in the aspects mentioned above. The State is importer of starch; the reversal of this framework already increase cassava's participation in the paraense economy. Note that the Paraná is the first national producer of such raw materials with sales of approximately 600 million reais in 2009.

In 2008 the National Congress approved the Bill 4,679 which provided for the addition of 10% of cassava flour, refined flour or starch from cassava zest to wheat flour for use in baking industry. Pressure lobbyist against this measure was very strong by the Associação Brasileira da Indústria de Trigo (Abitrigo), Movement of Housewives and Consumers of Minas Gerais, Brazilian Industry and Confectionary Bakery (Abip in Portuguese), so that President Lula vetoed fully the addition of starch from cassava to flour bought by the public administration, among other reasons, quoted: *"there will be very difficult to proof of guarantee that the product has the composition proposal"*. Your competitiveness depends on relative prices (manioc starch x wheat flour).

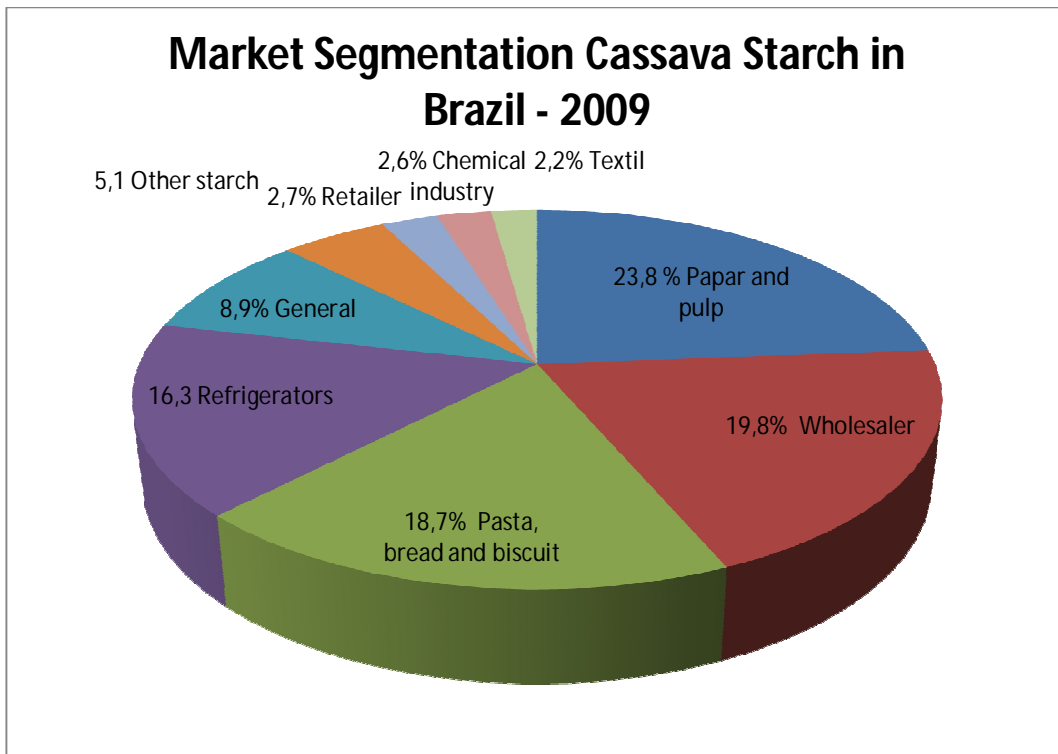
The Brazilian production of cassava starch is concentrated in five States, as demonstrated in the table below.

Main States of Cassava Starch Producers in 2009

States	Production/t	%
Paraná	413,200	71
Mato Grosso do Sul	82,452	14
São Paulo	26,274	13
Santa Catarina	6,926	1
Goiás	5,000	1

Source: CEPEA/ABAM

The manioc starch market in Brazil, presents the segmentation demonstrated in the chart below.



Source: CEPEA/ABAM

The Brazilian production of cassava starch in 2009 was 583.85 thousand tons. Exports represented 7.33% of such production, 42, 8 tons with FOB value of US\$ 38 million.

The world market of starch for 2010 is the consumption of 70 million tonnes. The starch from cassava participates with 7.6% (5.32 million tonnes). The average consumption/capita/year natural starches and modified in the major industrialized countries is only 1 kg to 10 kg, and in developing countries. This big difference shows the growth potential for the starch industry.

With this scenario in favour of cassava industry expands in Asia. In Thailand are the largest industrial plants for the production of starch which makes this country the world's leading exporter of starch from cassava. On that continent, the chain of production of manioc has rapidly developed, anchored in productive varieties, improved cultivation systems, competitive and industrial units in diversification of by-products.

The insertion of Pará in cassava starch market will bring important socioeconomic benefits. Will import this raw passing to export it to a demand with huge potential for expansion. Will increase significantly the production value of cassava, today is estimated at around one billion reais. This means increasing the current

planted area of 325 thousand hectares giving use the areas occupied by man and abandoned, and which are already served by drainage infrastructure, electric energy and services. These benefits to aggregate knowledge about the growing of manioc already embedded in the culture of paraense producer, which greatly facilitates the introduction of innovations in both the agricultural stage as in industrial processing.

Another by-product of cassava of great interest for the paraense economy is ethanol. By presenting high starch content, which can later be converted into glucose, cassava can also be used as feedstock for the production of alcohol. A ton of cane with 140 kg sugar Total Recoverable (ATR) produces 85 litres of alcohol, a ton of cassava with income 20% starch can produce up to 104 litres of alcohol.

Despite this favourable result for cassava, one of the major obstacles for alcohol production of cassava in Brazil is in agricultural productivity. While the average Brazilian cassava productivity revolves around 13.6 tonnes per hectare sugar cane reaches 72.8. In favor of cassava is that there is still plenty of space to be conquered is exemplary in terms of productivity, while for sugar cane, which for years has been developing its potential agronomic, increments in productivity are smaller and higher costs.

Speaking in production costs, in time, is another obstacle to mandiocultura. In São Paulo, in 2005/2006 crop sugar cane presented a cost of \$ 37.60/t for the first cut, with productivity of 127t/ha and r \$ 39, 18t/ha to sugar cane fifth cut with productivity of 71t/there is. The cost of production of manioc was R \$ 84.52/t for cassava a cycle with productivity of 43t/ha and R \$ 91.87/t for cassava two cycles with productivity of 76t/ha.

One of the great advantages for the exploitation of cassava as ethanol producer is the genetic diversity of this plant in Brazil. EMBRAPA Recursos Genéticos e Biotecnologia works with a variety found in the Amazon with large amount of sugar in the root. Their domestication and its intersection with other varieties of cassava resulted in plants in which the starch to be transformed into sugar exempts the hydrolysis process. The deletion of that step reduces 30% energy consumption in the process of production of ethanol from cassava. EMBRAPA Amazônia Oriental research on cassava production for ethanol production in northeastern Pará.

On the possibilities that cassava can bring to the economy of Pará State, which presents itself is a disincentive to mandiocultura. The inflation suffered by flour reflects well this neglect. Second the Diese-PA, in 15 years of actual plan manioc flour accumulates the biggest adjustment between basic food paraense table, with almost 500% increase. Urges that this segment receive attention by the Government of the State and institutional leaders in the industry so that it can better contribute to the development of Pará. Capability for such exists.

It is concluded that the benefits of enlargement for the paraense economy *radiocultura* undergo modernisation. This in turn comprises the following points: a) the mechanisation of cultivation; b) agronomic research; c) better standard of flour processing industries, from small artisanal units until units of medium and large enterprises; d) installation of undertakings; e) periodic information on prices; f) availability of credit; g) official existence of rural extension and lumber industries; h) bi-fuel source. For both, the cassava production chain should be treated as a MATTER OF STATE in development planning in the State of Pará, because it has the potential to leverage developing economies before its capacity to generate wealth and income distribution.