



Tropentag 2008:  
Competition for Resources in a Changing World:  
New Drive for Rural Development  
October 7 - 9, 2008, Stuttgart-Hohenheim, Germany

---

## **The competitiveness of Brazilian rice in the world market: A comparative advantage approach**

Alcido Elenor Wander<sup>ac\*</sup>, Sydênia de Miranda Fernandes<sup>b</sup>, Carlos Magri Ferreira<sup>a</sup>

<sup>a</sup>Brazilian Agricultural Research Corporation (EMBRAPA)/National Rice and Beans Research Center. P.O. Box 179, 75375-000 - Santo Antonio de Goias, GO, Brazil. E-mail: [awander@cnpaf.embrapa.br](mailto:awander@cnpaf.embrapa.br)

<sup>b</sup>Federal University of Goiás (UFG)/School of Agronomy and Food Engineering. P.O. Box 131, 74001-970 - Goiânia, GO, Brazil.

<sup>c</sup>Faculdades Alves Faria (ALFA), Av. Perimetral Norte, 4129 – Vila João Vaz, 74445-190 - Goiânia, GO, Brazil.

### **1 Introduction**

Among cereals, rice represents a major source of food for an important part of global population. Rice is grown worldwide basically in three different cultivation systems: irrigated lowland rice, upland aerobic rice and deep water rice. In Brazil, basically irrigated lowland rice and aerobic rice are grown. Only irrigated lowland rice is being exported.

Considering the amount of production, a 3-years-average (2004 – 2006) indicated that the main producers are: China, India and Indonesia. Brazil is 9<sup>th</sup> worldwide rice producer (FAO, 2007). But production does not mean export and vice-versa. According to Ferreira (2005) “the main rice producing countries are not always the main exporters. In fact, they produce mainly for their domestic markets and export only the surplus.

The 3-years-average (2003 – 2005) for exports, indicate that the main rice exporters, based on the monetary value of exports obtained from WTO data, are the United States of America, Uruguay and China (FAO, 2007). Considering export amount, Brazil is at 43<sup>th</sup> position. There is a big disparity between production and exportation amounts.

As rice world stocks fall and prices climb, the food security of many countries can be negatively affected. However, for rice exporting countries, new opportunities may arise from this new scenario, where currently only 7% of total production is being internationally traded. New players may appear in the rice market while others may reduce their participation.

Based on this assumption, this paper’s aim was to analyze the international competitiveness of Brazilian rice considering the world market as well as some selected rice producing and exporting countries as potential competitors.

### **2 Material and Methods**

To assess competitiveness of a country the Revealed Comparative Advantage Index (RCAI) proposed by BALASSA (1965) is useful. The RCAI shows if a country is competitive in producing and exporting a specific good.

The RCAI can be estimated by the equation:

$$RCAI_j = \frac{\left(\frac{X_{ij}}{X_i}\right)}{\left(\frac{X_{wj}}{X_w}\right)} \quad (1)$$

Being:

$X_{ij}$  = monetary value of Brazilian rice exports;

$X_i$  = monetary value of all Brazilian exports;

$X_{wj}$  = monetary value of world rice exports<sup>1</sup>;

$X_w$  = monetary value of all world exports.

If:

$RCAI < 1$  – Brazil does not have a revealed comparative advantage;

$RCAI > 1$  – Brazil has a revealed comparative advantage; and

$RCAI = 1$  – Brazil has neither revealed comparative advantage, nor disadvantage.

According to RCAI, a country would have a revealed comparative advantage and be competitive if the RCAI is higher than 1.0.

To estimate the RCAI of Brazilian rice in relation to main producing and exporting countries, data of Faostat<sup>2</sup> (FAO, 2007) and World Trade Organization (WTO, 2007) was used.

The analysis considered the period from 1995 to 2005.

### 3 Results and Discussion

The main rice producers also are big consumers. This partially explains the results obtained. Table 1 shows the revealed comparative advantage of Brazilian rice in relation to China, India and Indonesia.

Table 1: Revealed comparative advantage index (RCAI) of Brazilian rice in relation to selected important rice producing countries, 1995-2005.

Year	Brazil vs. China	Brazil vs. India	Brazil vs. Indonesia
1995	0.08	0.00	416.76
1996	0.03	0.00	3.53
1997	0.02	0.00	31.47
1998	0.01	0.00	2.92
1999	0.06	0.01	7.24
2000	0.04	0.01	21.60
2001	0.06	0.01	6.43
2002	0.06	0.00	3.71
2003	0.04	0.00	9.28
2004	0.07	0.00	7.52
2005	0.30	0.01	0.92

Source: Estimation by the authors with data from FAO (2007) and WTO (2007).

<sup>1</sup> Countries considered in this study are China, India, Indonesia, United States of America and Uruguay.

<sup>2</sup> Milled, husked and paddy rice have been considered.

Brazil is an important rice producer and also exporter in some years. The estimation of revealed comparative advantage of Brazilian rice in relation to the main producers showed Brazil is disadvantaged to China and India, but showed advantages compared to Indonesia i.e., the RCAI used to be higher than 1.0.

The market prices for rice in India, China and Indonesia<sup>3</sup> are higher than in Brazil. The Brazilian disadvantage compared to China and India happens due to the much bigger production of these two countries and the monetary value based RCAI used.

Table 2 shows the results of RCAI of Brazilian rice compared to USA, Uruguay and China, which were the 3 main exporters in the 3-years-average 2003-2005.

Table 2. Revealed comparative advantage index (RCAI) of Brazilian rice in relation to selected important rice exporting countries, 1995-2005.

Year	Brazil vs. USA	Brazil vs. Uruguay	Brazil vs. China
1995	0.022	0.0005	0.077
1996	0.016	0.0003	0.026
1997	0.021	0.0003	0.017
1998	0.043	0.0008	0.015
1999	0.155	0.0024	0.059
2000	0.085	0.0013	0.038
2001	0.089	0.0011	0.065
2002	0.064	0.0009	0.057
2003	0.030	0.0005	0.037
2004	0.020	0.0005	0.069
2005	0.065	0.0023	0.305

Source: Estimation by the authors with data from FAO (2007) and WTO (2007).

Brazil as has not been competitive in exporting rice. Its main disadvantage was compared to Uruguay, which is a quite small producer (29<sup>th</sup> worldwide producer) but of high value exports<sup>4</sup>. However, as FERNANDES ET AL. (2008) showed, specific Brazilian states like Rio Grande do Sul may have comparative advantages to export rice.

#### 4 Conclusions and Outlook

The main findings were that, so far, Brazil has no comparative advantage in producing rice and exporting it to the world market. Thus, Brazil's participation in the world market depends on structural changes in the rice market as well as on issues related to cropping systems that may arise in the future.

#### 5 References

BALASSA, B. (1965). Trade Liberalization and "Revealed" Comparative Advantage. The Manchester School of Economic and Social Studies.

<sup>3</sup> In 2005 the average prices for 1 metric ton of paddy rice were USD 128.15 in Brazil, USD 149.83 in India, USD 150.92 in China and USD 210.29 in Indonesia (FAO, 2007).

<sup>4</sup> In 2005 the average prices for 1 metric ton of paddy rice were USD 128.15 in Brasil, USD 150.92 in China, USD 155.00 in the United States of America and USD 338.35 in Uruguay (FAO, 2007).

FERNANDES, S.M., WANDER, A.E., FERREIRA, C.M. (2008). Análise da competitividade do arroz brasileiro: vantagem comparativa revelada. In: Congresso Brasileiro de Administração, Economia e Sociologia Rural, Rio Branco, AC.

FERREIRA, C.M., SOUSA, I.S.F.D., VILLAR, P.M.D. Desenvolvimento tecnológico e dinâmica da produção de arroz de terras altas no Brasil. Santo Antônio de Goiás-GO: Embrapa Arroz e Feijão. 2005.

Food and Agriculture Organization (FAO). Faostat database. Available at: <<http://faostat.fao.org>>. Accessed: 29 July 2007.

World Trade Organization (WTO). Website. Available at: <<http://www.wto.org>>. Accessed: 05 September 2007.