5.3.2 Impact on Amazon regional environment due to Cerrados development

The migration movement to the Center-West region started in 1970 because of the Cerrados exploitation, and it continues until today, although in a less intensive way. The migration movement reaches today regions located in the north, looking for new agricultural areas. Figure 5.3.4 shows the emigrants participation in the total population of many regions as of 1996. The percentage of emigrants is high in the Cerrados region, mainly in the Center-West region. It is also possible to observe a migration movement in the Amazon region.

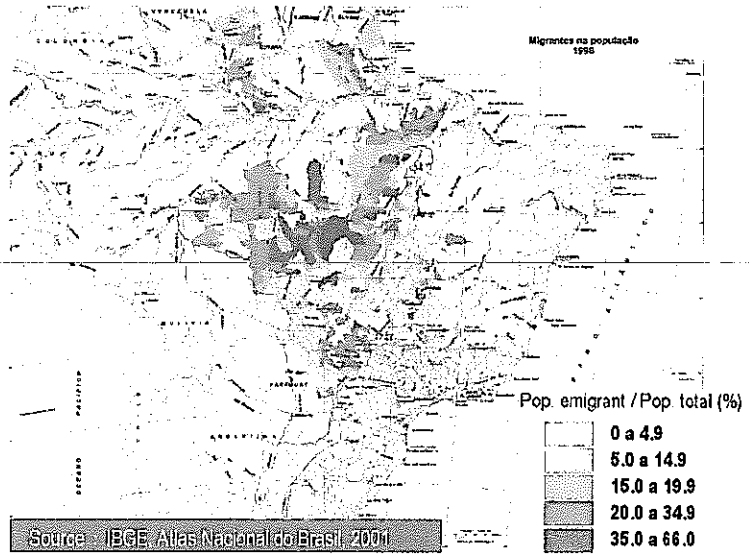
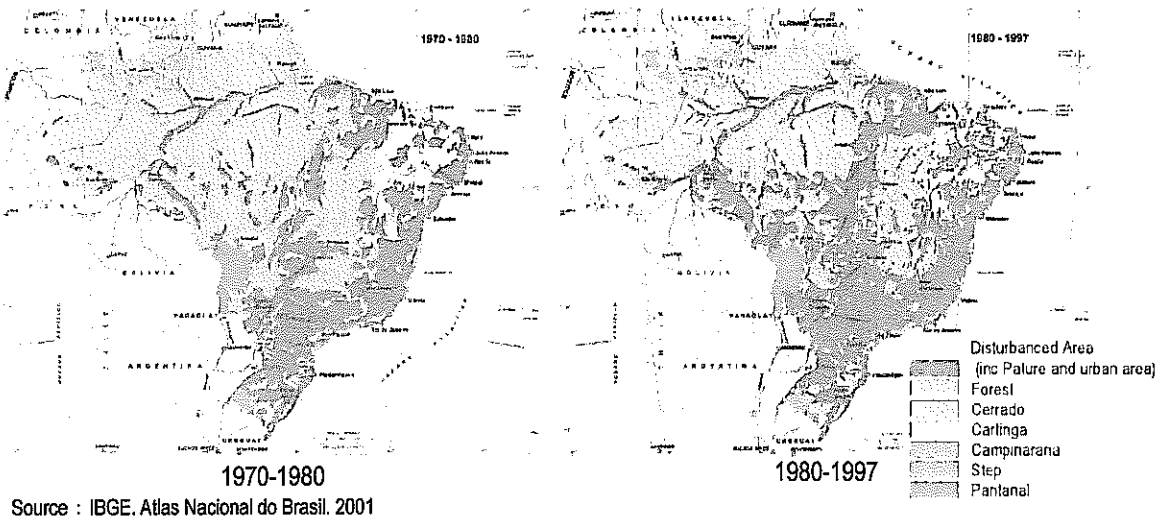


Fig. 5.3.4 Emigrants Participation in the total population

Figure 5.3.5 presents the migration evolution and the reduction of Amazon regional vegetation due to Cerrados development. The red portion of the figure shows the deforested area resulting from human activity and the speed in which the Cerrados region was opened in the period from 1980 to 1997. On the other hand, the Amazon region development (excluding the States of Tocantins, Maranhão, Bahia, Mato Grosso and Roraima, all of them part of the Legal Amazon area) was restrained because of legislation that restricted the development process. In the Cerrados region of the Roraima State, Legal Amazon, soybean cultivation has started to take advantage of the weather where the rainy period occurs at a different time than with the Center-West region.



Source : IBGE. Atlas Nacional do Brasil. 2001

Fig. 5.3.5 Evolution of Vegetation Decrease

5.3.3 Prodecer commitment to environment conservation

(1) Environment monitoring activities

Among the Prodecer principles, the concept that there is no sustainable agriculture development without harmony with the environment is implicit. So, in Prodecer II, forest reserves were preserved as a joint preserves, a collective form of preservation area. Apart from this, in Prodecer III, besides conservation of preserves in a collective manner, as a joint preserves, which represents a minimum of 50% of the total area, measures that contribute to the environment conservation such as construction of contour lines, introduction of crops rotation of crops, seeding cultivation, etc., are actively and continuously adopted.

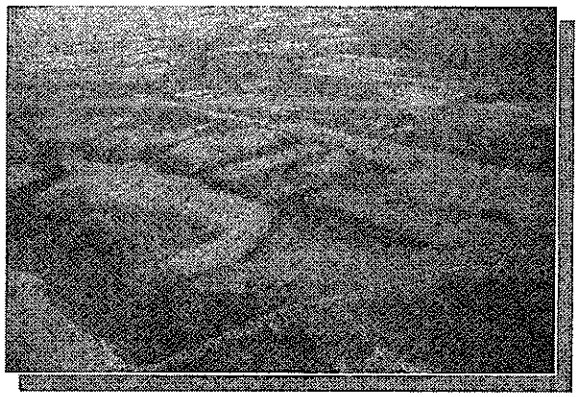
The projects of technical cooperation, such as the 'Project of Technical-Scientific Support for the Cerrados Agricultural Development' (1977~1992) and the "Project of Technical-Scientific Support for the Cerrados Sustainable Agricultural Development with an emphasis on the Natural Resources Preservation' (1994~1999), were engaged for the consolidation of agricultural techniques that could reduce, to the maximum degree, the environmental impact, preserve the natural resources and be friendly to the environment.

During 'environment monitoring' (1992~2000), some indexes of Prodecer impact on the environment were conceived. The obtained data and the methodology used at the time, are been used in other Cerrados region environment researches. This monitoring was done, as shown in the figure below, as a technical cooperation project with technical and financial support from JICA to CAMPO. The data evaluation was performed with EMBRAPA-Cerrados collaboration and the results have recently been

published.

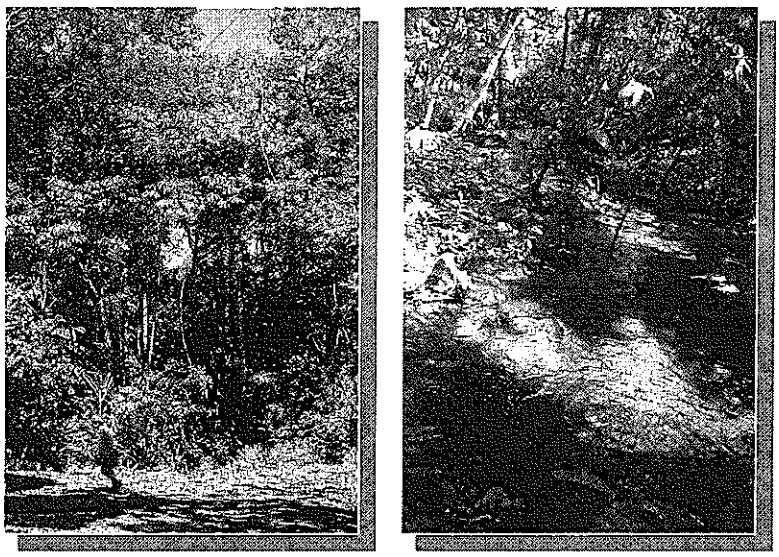
(2) Preservation of biodiversity through community preserves and micro-corridors

To implement Prodecer, CAMPO took care to plan the use of the soil in the inner areas of the projects. The areas were divided into annual crops, perennial crops, pastures and legal reserves all accordingly to the environmental legislation. As for the legal reserves, CAMPO has adopted two plans of actions: to establish individual preserves inside each lot and community preserves. The individual reserves are isolated islands inside each lot. While, on the other hand, the community preserves gathers the individual reserves into one large area, conserving the natural vegetation in a larger unit. It also avoids the possibility that the preserve accidentally becomes a cultivated area. In addition, they protect biological species that need larger areas and facilitate biodiversity preservation on a high level.



Riparian vegetation along the riversides

The survey of land use carried out in the environment monitoring showed the conditions of land use in Prodecer I and Prodecer II, after 7 or 13 years of project implementation, and compared this with the initial plan. The result revealed a 34% reduction of the individual preserves, while the community preserves decreased only 2%. Based on this result, CAMPO adopted the model of natural community preserves in Prodecer III projects. The previous surveys show that even today, the preserves of the projects are been maintained in accordance with the law.



Natural forest of the micro-corridor and a water spring

Figure 5.3.6 shows the conditions of the Pedro Afonso Project natural preserve, of Prodecer III.

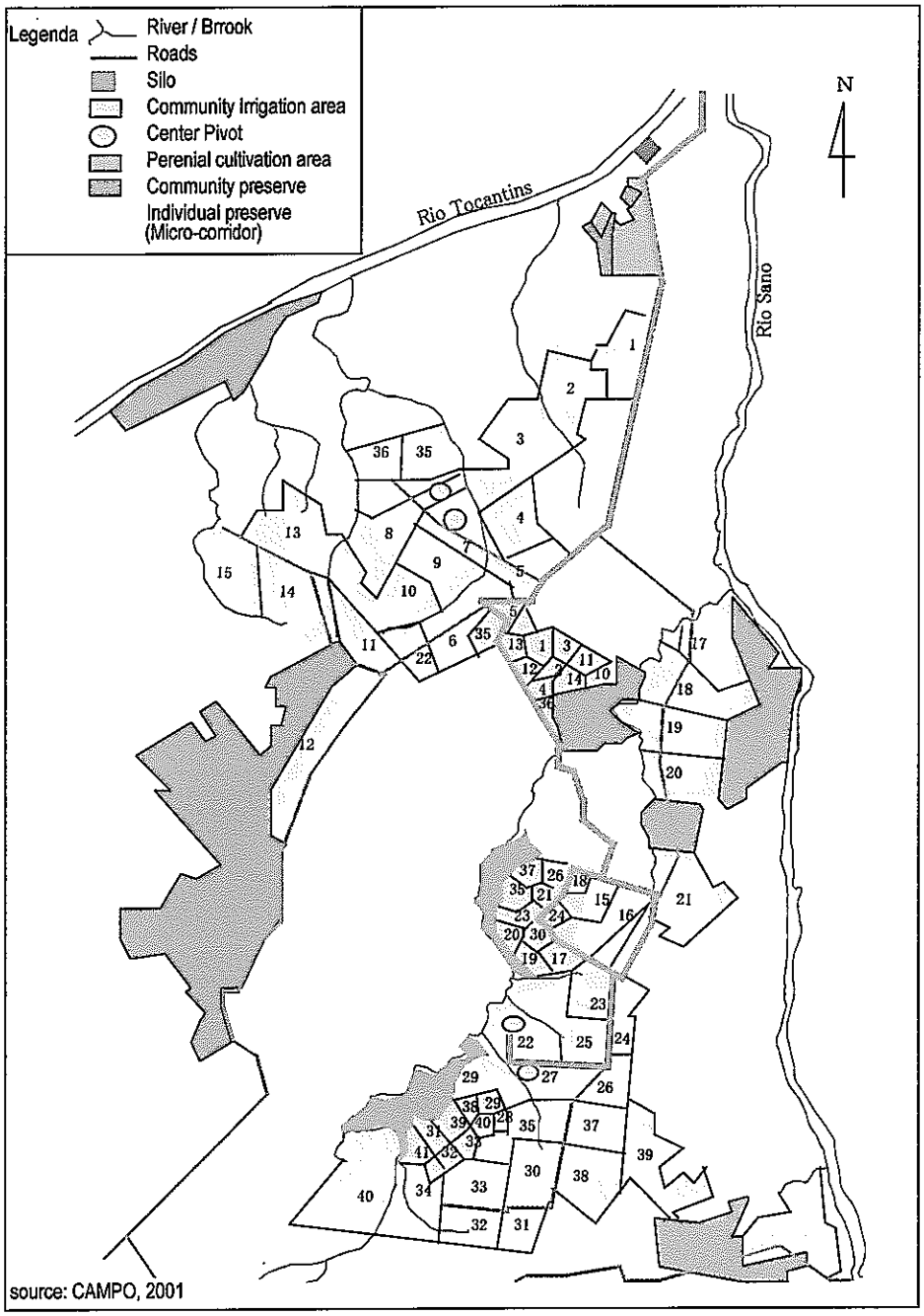


Fig. 5.3.6 Community preserves and Individual's(; Micro-corridor) in the Pedro Afonso Project's of Prodecer III

Usually, the individual preserve is in the form of a corridor, alongside a watercourse that crosses the property. This is called a micro-corridor and its role is to preserve the springs, maintain biodiversity, conserve the quality of the water and avoid erosion. The areas nearby the rivers are formed by riparian vegetation with a higher or lower descending slope, with rich biodiversity. The protection areas alongside the river borders are determined by law, and their size depends on the river width.

(3) Other activities of environmental conservation

In Prodecer projects, activities with the technical assistance from CAMPO to raise the environmental conservation consciousness of producers from the participant cooperatives were conducted in a sufficient manner. Introduction of environmentally friendly agricultural techniques were sought together with the sustainable production, avoiding as much as possible the contamination of the environment.

These are some of the measures taken:

- Soil conservation through the sod seeding practice.
- Adoption of the crop rotation to avoid the soil degradation.
- Introduction of microorganisms (rizobium) and organic matter to substitute for chemical fertilizers.
- Introduction of techniques for biological control of plagues and other diseases.
- Reforestation of degraded areas and replacement of riparian vegetation.
- Tree plantation to avoid loss of soil by aeolic erosion.
- Prohibition of the combined use of many pesticides.
- Paying attention to the management of pesticides and their packages to avoid river water contamination.
- Following environmental regulations through the training of rural workers, etc.

Due to the reduction of the CAMPO participation, especially in technical support services because of the program completion, these works became the responsibility of the Cooperatives. After the on site visits carried out in the projects, it was possible to observe that Prodecer producers are conscious and engaged in environment preservation.

5.4 IMPACT OF PRODECER ON THE COUNTRY'S ECONOMY AND AGRICULTURE

5.4.1 Contribution to export and development of soybean product related sectors

Figure 5.4.1 shows the soybean flow from its production (raw material) until the final product (oil, bran, etc.).

With the increase of soybean production, processing was also developed, increasing the production of bran that through the roughage industry supplies the livestock husbandry sector (swine husbandry, aviculture, etc.). The produced oil is destined for final consumption after refining or is used as raw material for the food industry, etc. The

development of soybean product related sectors (agro-industry), as already seen, creates a high multiplier effect, developing other activities, based on the intense need in other sectors for production inputs, fertilizers, agricultural pesticides, machinery, seeds, etc., in addition to providing the incentive for development in other economic sectors such as transport, commerce, services, etc.

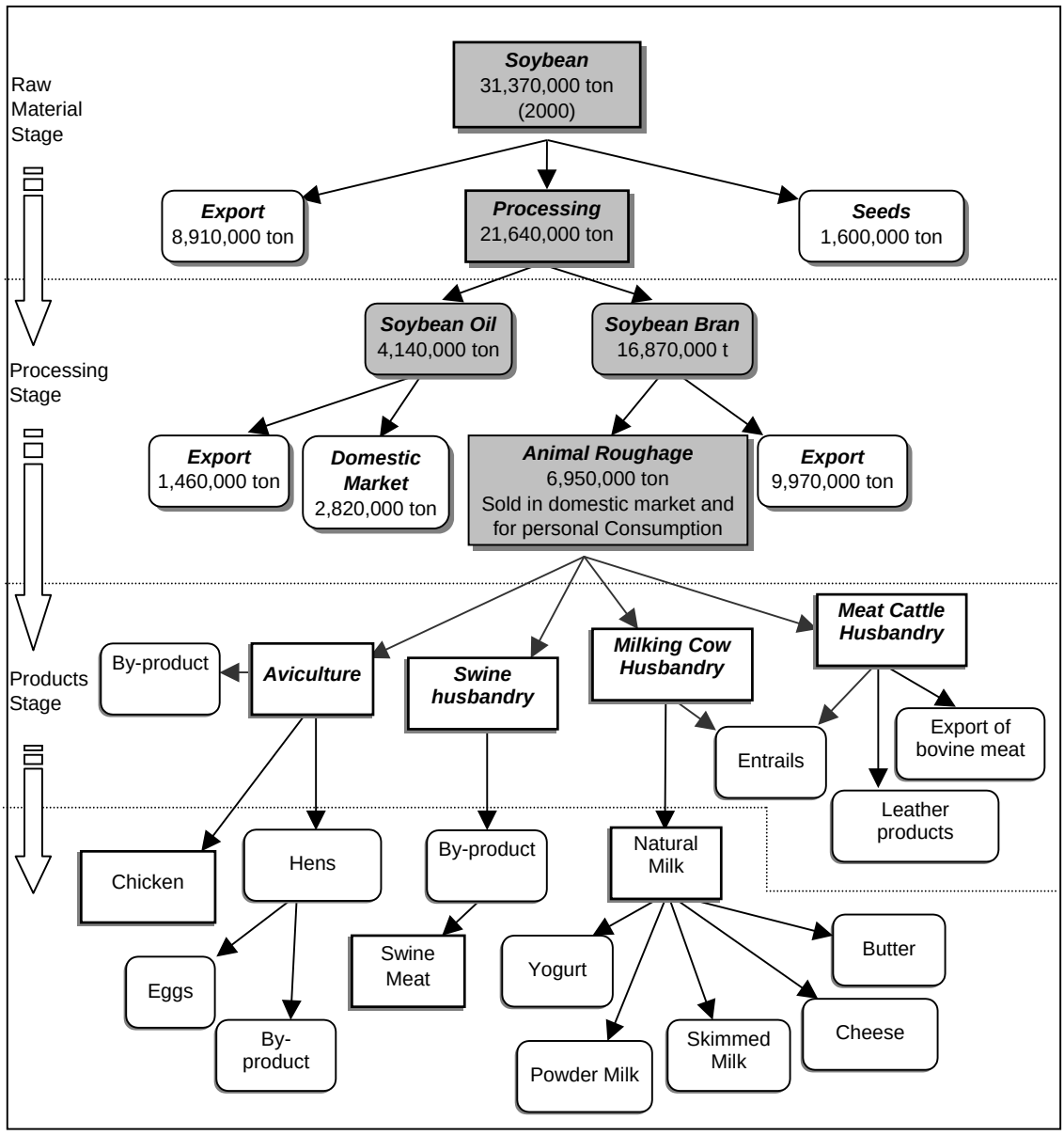


Fig. 5.4.1 Soybean Flow from Production to Final Product (data as of 1995)

The value of agricultural products exports in 2000 was US$16.6 billion, equivalent to 24% of the total value of exports of Brazil. The value of the soybean complex exports was US$4.1 billion, equivalent to 25% of the value of all agricultural exports.

The soybean complex exports value was approximately US$4.1 billion in 2000. The

forecast of soybean production for 2006 is 50 million tons, and for the soybean complex exports, US$7.3 billion (ABIOVE, 2001). As will be described below, this is based on strong domestic demand from the livestock husbandry sector (mainly poultry and swine raising sectors), and expansion of exports expected from international markets.

5.4.2 Development of agro-industry mainly based on the soybean processing and livestock husbandry sectors

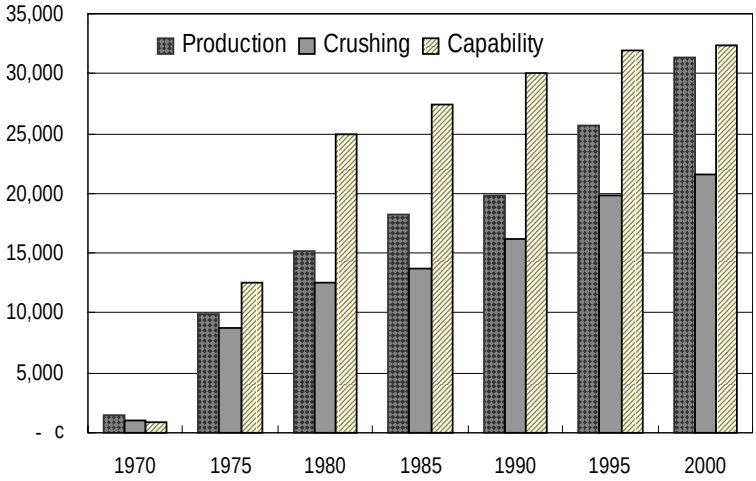
In Brazil, agricultural production represents 8% of the Gross Domestic Product (average in the period 1990~1999, IBGE). However, when the agro-industrial sector is aggregated, this participation rises to more than 30%. The extraordinary multiplier effect of the soybean agro-industrial chain greatly contributes to this increase. In other words, it can be said that the increase of soybean production in the Cerrados region has significantly contributed to the development of the Brazilian agro-industry.

In the following sections, the development of these agro-industrial sectors is reviewed.

(1) Expansion of soybean processing capacity and increase of factory vacancy

The trend of crushing companies to move from the country's South Region to the Cerrados region and the dominance of multinational companies in the soybean crushing sector has already been described. This section describes the expansion of installed capacity and the occurrence of capacity vacancy in this sector.

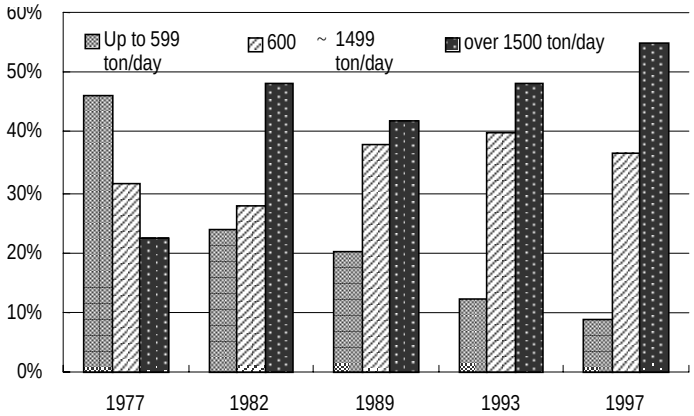
As shown in Figure 5.4.2, the industrial park of the soybean crushing sector in Brazil was small (932,000 tons in 1970) until the start of the Cerrados region development. After the effective start of development of this region occurred in the mid 70's, the sector started to expand its processing capacity reaching more than 25,000,000 tons in 1980.



Source: ABIOVE

Fig. 5.4.2 Evolution of Production Volume, Processing Volume and Processing Capacity of Soybean

As shown in Figure 5.4.3, processing in larger scale industrial units has progressively increased. In 1977, 45% of soybean was processed in factories with capacity under 600 tons/day. After this period, the participation of large-scale factories increased, and in 1997, 53% of the total was being processed in factories with capacity over 1,500 tons/day. This trend of processing plants size increase is due to the search for gains of economies of scale, since the processing cost reduction for plants processing 600~1000 tons/day is 3.5%, and for those processing 1,500~2,000 ton/day is 5.6% (Castro, Sparks Companies, 1996). This shows that the bigger the plant, the higher is the processing cost reduction.



Source: ABIOVE

Fig. 5.4.3 Evolution of the Soybean Processing Participation, by Crushing Plant Size

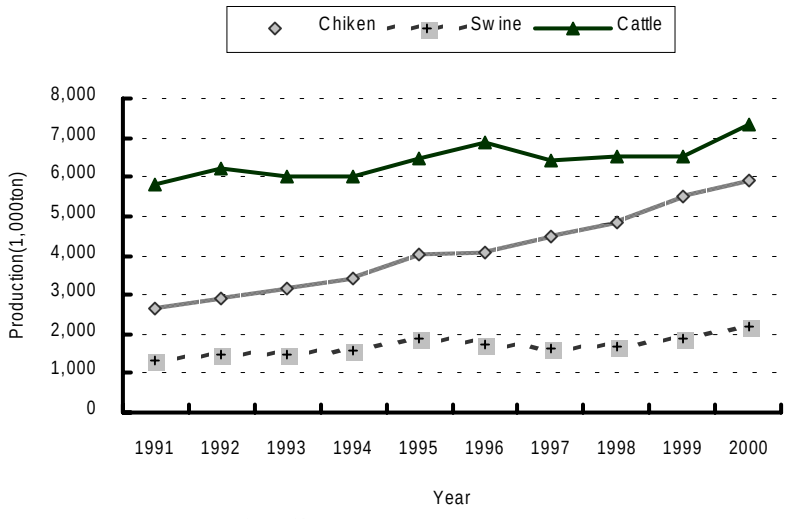
As shown in Figure 5.4.2, already mentioned, the soybean processing capacity in Brazil was 32,400,000 tons in 2000, but only 21,600,000 tons were actually crushed. The occupation rate of these units has dropped since 1996, and in 2000 the occupation rate was only 60%. 15% of all the crushing plants in Brazil are not operating, and since 1995 no new plant was built. In the same period, USA and Argentina plants operated with occupation rates of 95% and 80%, respectively. At present, multinational grain companies are investing in these two countries (according to interview carried out at ABIOVE, in August 2001).

As restraining factors to the soybean processing activity, those caused by the tax system stands out, such as the different ICMS (Tax on the Products Transit) per State, due to losses in efficiency and competitiveness because of the system complexity. These restrictions will be better analyzed in Chapter 6 of this Study.

(2) Contribution to the progress of livestock husbandry

As a consequence of the soybean production increase in the Cerrados region, the production and supply of animal roughage also increased. Soybean bran, after the extraction of oil, is indispensable for the livestock husbandry activities, especially in aviculture and swine husbandry. As a result, the production volume of these products is increasing considerably in the country, as shown in Figure 5.4.4.

The production of chicken meat increased from 1.5 million tons in the beginning of the 80's, to 6 million tons in 2000, making possible its export since the 80's. In the same period, the production of cattle meat more than doubled from 3 million tons to more than 7 million tons. Swine meat production also doubled in the period, from a production of a little less than 1 million tons to 2 millions tons.



Source:IBGE/FNP/ABCS

Fig. 5.4.4 Evolution of the Meat Production (chicken, swine and bovine cattle)

Table 5.4.1 shows the evolution of agriculture and livestock husbandry in the total value of Agricultural GDP. In 1990, agriculture represented 66% of the total, but in 1998 the situation reversed, and livestock husbandry represented 60% of the total.

Table 5.4.1 Percent Participation of Agriculture and Livestock Husbandry in Relation to the Total Value of the Agricultural Sector Production

	Total GDP	Agriculture	Part. %	Livestock Husbandry	Part. %
1990	44,426	29,857	67.2	14,569	32.8
1991	44,965	31,696	70.5	13,269	29.5
1992	47,143	32,437	68.8	14,706	31.2
1993	46,494	31,915	68.6	14,579	31.4
1994	51,611	35,465	68.7	16,146	31.3
1995	85,376	30,551	35.8	54,825	64.2
1996	99,745	31,252	31.3	68,493	68.7
1997	97,452	32,426	33.3	65,026	66.7
1998	107,306	43,141	40.2	64,165	59.8

Source: FVG/ IBGE.

The increase of meat production is responsible for the increase of *per capita* consumption of meat in Brazil (Table 5.4.2).

Table 5.4.2 Evolution of Per Capita Consumption of Meat and Eggs (kg/year)

	1975	1985	1995	1998
Bovine	19.3	22.4	34.9	33.6
Chicken	5.1	9.3	23.3	24.1
Swine	6.9	5.7	8.7	9.2
Eggs	4.3	7.0	7.6	7.5

Source: Elaborated using the “FAO STAT Food Balance Sheet, 2000” data.

Maize is worldwide the most utilized raw material for animal roughage. In Brazil, since the production of soybean bran is increasing, reaching 17,000,000 tons at present, it is becoming an important source of animal roughage together with maize. The use of grains for animal feed directly competes with the use of grains for human consumption. Hence, grain demand for animal feed pushes up the prices of products for human consumption. Under such circumstances, the increase of soybean bran production meets some of the demand for animal roughage, restraining the pressure on the maize demand. Thus it can be said that soybean production in the Cerrados region not only contributed to meet the demand of soybean itself, but also contributed to the expansion, in an integrated fashion, of the whole supply of food, including livestock products.

ECONOMIC IMPORTANCE OF SOYBEAN PRODUCTION FROM THE VIEWPOINT OF THE JAPANESE-BRAZILIAN JOINT RESEARCH RESULTS

As part of the joint research between JIRCAS and EMBRAPA, the elaboration of the "ANALYSIS OF SECTORS REGARDING TO THE MULTIPLIER EFFECT OF SOYBEAN EXPORT AND THE BRAZILIAN ECONOMY" (authored_ by Hideki Ozaki and Yoshihiko Sugai, International Information Paper on the Results of Agricultural Research, No. 6, pages. 15~21, 1999) was carried out by researchers of both organizations and is in progress. In this joint research, the GDP induced by the demand of soybean products and soybean (*in natura*) export is simulated through the establishment of the following models.

Case 1: Export of 1 million tons of soybean *in natura*.

Case 2: Export of industrialized products equivalent to 1 million tons of soybean.

As the analysis results, the induced production value, the induced GDP value and the induced export value were simulated as follows:

(Value in R$1,000)

	Case 1 (Export of 1 million tons of soybean)			Case 2 (Export of industrialized products equivalent to 1 million tons of soybean)		
	Production value	GDP Value	Export Value	Production value	GDP Value	Export Value
Agricultural / Food Products						
• Soybean in grains	194,912	119,987	1,866	590,497	200,783	32,594
• Other agric. products	192,000	118,687	1,564	192,000	118,687	28,760
• Vegetal oil / bran / others	1,680	1,036	92	39,468	24,337	2,166
• Other food products	577	93	60	353,116	56,211	107
	655	171	150	5,913	1,548	1,562
Petroleum and by-products	13,972	6,079	3,654	20,657	8,934	5,321
Ore	1,779	757	297	2,206	938	360
Other industrial. products	52,144	18,768	10,446	77,746	28,145	15,989
• Fertilizers	16,855	5,657	2,302	18,750	6,298	2,561
Services	48,217	21,451	3,119	97,907	44,516	5,732
Total of productive sector	311,024	167,042	19,382	789,014	283.316	59,995

Remark: The export value of 1 million tons of soybean *in natura* (case 1) and the value of industrialized products export equivalent to 1 million tons of soybean (case 2) correspond to R$202 and R$373 million, respectively, in terms of exports.

The analysis, in CASE 1: "A GDP of R$167 million for the total productive sector was induced, but the multiplier effect of other sectors, except the soybean production sector, is relatively small".

The analysis, in CASE 2: "The multiplier effect in the national economy is broad, not limited to the soybean production sector, but also reaching crushing factories, other industries, the services sector, inducing a total of R$283 million of the GDP".

Thus, we can verify that in CASE 2 the expected GDP increase is 70% higher in comparison to CASE 1. The economic impact of industrialized products export is much higher than the export of *in natura* products, with higher impacts on other national economic sectors.

Through this analysis, the report shows that:

1) the export of soybean and soybean derived industrialized products greatly contributes to the economic stabilization of the country;

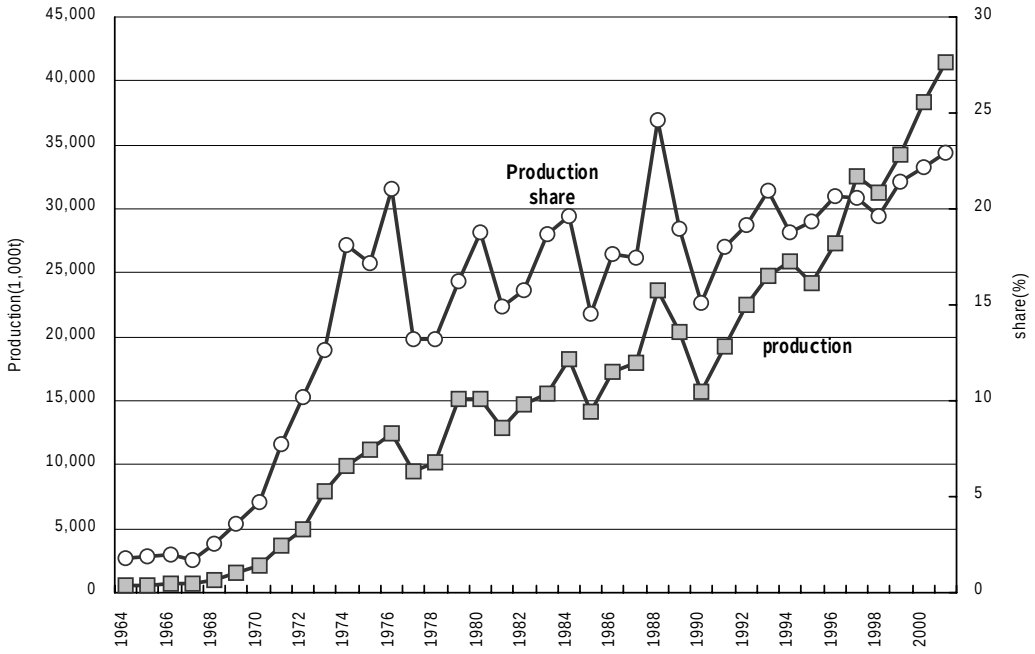
2) 2) to stimulate the country's economy, the promotion of industrialized products export is an efficient governmental policy.

5.5 IMPACTS OF PRODECER ON INTERNATIONAL MARKETS - FOCUSING ON INCREASES IN SOYBEAN PRODUCTION IN BRAZIL -

5.5.1 Soybeans

Soybean production in Brazil has increased dramatically during recent years reaching 40 million tons and accounting for more than 20% of total world production. Soybean production of the Cerrado areas was only 2 million tons in 1980 accounting for only about 10% of the nation's total production when the Prodecer program was started. However, since then, soybean production in the Cerrado areas was encouraged by the Prodecer program as well as POLOCENTRO Plan and grew substantially till it now accounts for about half of the nation's total soybean production. It is now apparent that further increases in soybean production in Brazil will be coming mainly from the Cerrado areas.

Because of major improvement of soybean production in the Cerrado areas, the national total soybean production increased from 15 million tons in 1980 to over 40 million tons in 2001 (Fig. 5.5.1). The yields per hectare were unstable during the 1980's at around 1.7 tons/ha, but they are now quite stable at around 2.5 tons/ha. This production level is as large as the current level in the U.S. (See Fig. 5.5.5 shown below).



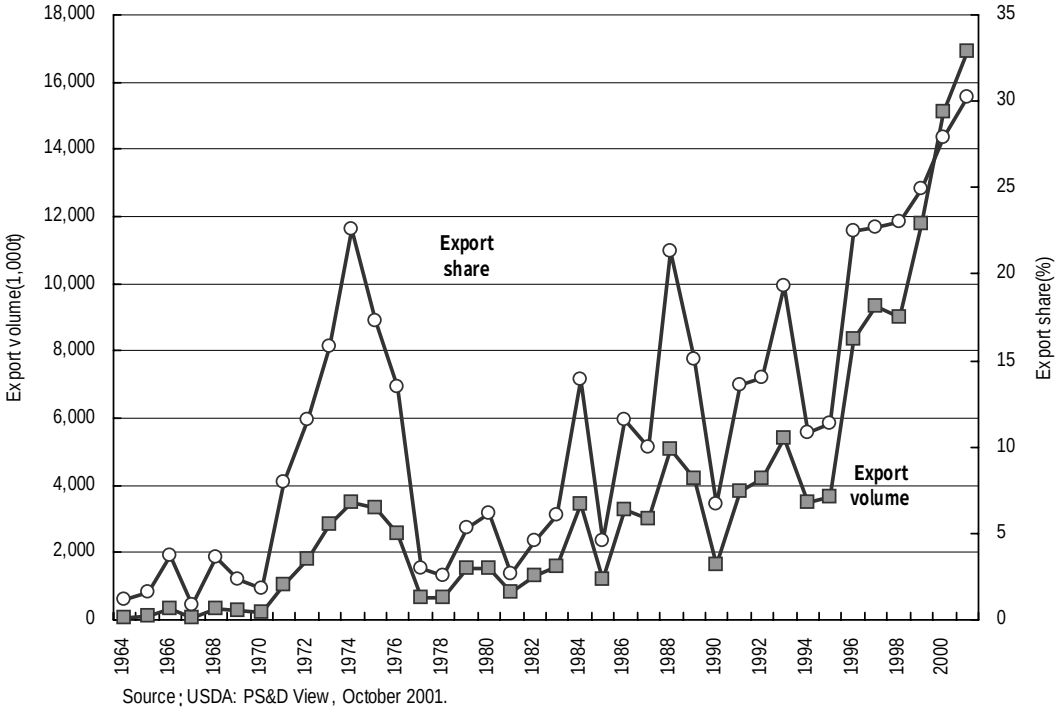
Source¦USDA: PS&D View, October 2001.

Fig. 5.5.1 Production of Brazil and Production share in the World Production of Soybean

The Brazilian soybean production is now the second largest in the world after the U.S. which produces almost 80 million tons. Soybean production in the U.S. was quite unstable and stagnant in the 1980's and also during the first half of the 1990's. It even decreased considerably during that period. On the other hand in Brazil, as mentioned

above, soybean production grew greatly from 15 million tons to 40 million tons during the last 15 years. Accordingly, the Brazilian shares of soybean production in the world increased from 15% in the early 1980's to over 20% in recent years, growing at a faster speed than in the rest of the world. This progress was greatly supported by the improvement of varieties which are applicable in the areas around the equator. Those varieties were developed by the joint research of Japanese-Brazilian governments under the overall Prodecer programs.

Based on the increases in domestic soybean production particularly in the Cerrado areas, Brazilian soybean exports increased dramatically reaching 17 million tons in 2001 and accounting for a quarter of the world total 56 million tons of soybean exports (Fig. 5.5.2).



Source ; USDA: PS&D View , October 2001.

Fig. 5.5.2 Export volume of Brazil and Export share in the world of soybean

The increases in Brazilian soybean exports were particularly remarkable during the last 5 years. In the past, soybean exports from Brazil increased in the 1970's when the food supply shortages were experienced throughout the globe. The market prices rose greatly during those days. Brazil reacted very flexibly to the market prices back then, and its exports increased from 0.5 million tons in the early 1970's to 3.5 million tons in 1974. Brazilian Soybean exports then returned back to a 0.6 million ton level in 1977 and 1978. It was around 1980 when Brazilian soybean exports again began to increase. The exports fluctuated for the first 15 years after 1980, but during the last 6 years, soybean exports from Brazil increased by 4 times reaching 17 million tons and earned

for Brazil the status as a stable and reliable supplier in the world soybean markets.

Table 5.5.1 shows the top four exporters of soybeans from the 1960's through the first half of the 1990's. The U.S. has been the largest soybean exporter throughout the period. The U.S. accounted for almost 90% of the total world soybean exports in the 1960's, and Brazil was the third largest exporter after China. During the food shortage period in the 1970's, Brazil became the second largest exporter. 10 years later, Argentina earned the distinction of being second. During the first half of the 1990's, however, Brazil returned as second, surpassing Argentina, third, by almost double the amount of exports of Argentina. Meanwhile, the U.S. share of soybean exports decreased to less than 70% during the period. Even at the beginning of the 21st Century, Brazil has maintained the second position in the world soybean export market accounting for a quarter while the U.S. share has decreased to a half.

These dramatic increases in soybean exports in Brazil were also supported by the improvements of infrastructure of the whole transport system (at the harbors and roads) as well as increases in soybean production. Infrastructure has continuously improved to further enhance agricultural exports.

Table 5.5.1 Volumes and Shares of the Top Four Countries in Soybean Exports from 1962 through 1996 (5 year average)

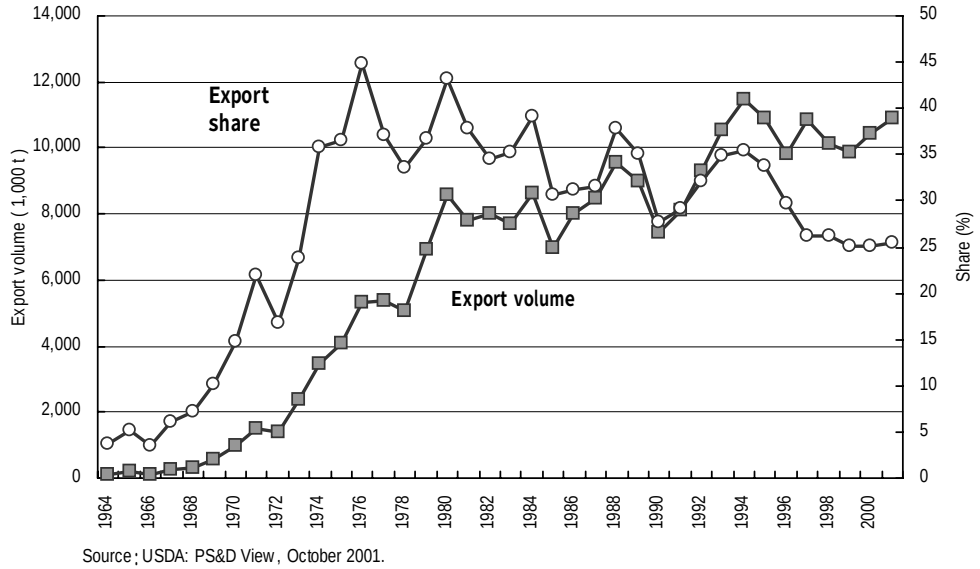
(unit: 1,000ton)

	1962-66		1972-76		1982-86		1992-96	
1st	US	6,571	US	13,926	US	20,377	US	21,462
2nd	China	564	Brazil	2,815	Argentina	2,256	Brazil	4,354
3rd	Brazil	167	China	255	Brazil	2,167	Argentina	2,323
4th	Canada	81	Argentina	147	China	1,042	Paraguay	1,450
	Others	39	Others	352	Others	1,048	Others	1,708
	World Tatal	7,422	World Tatal	17,495	World Tatal	26,891	World Tatal	31,297
	CR4	99.5%	CR4	98.0%	CR4	96.1%	CR4	94.5%
	CR1	88.5%	CR1	79.6%	CR1	75.8%	CR1	68.6%

Note 1: A five year average during the period.
Note 2: CR1 and CR4 indicate the concentration ratio(es) of the top 1 and top 4 countries, respectively.
Source: USDA/ERS: PS&D View, June 12,1997.

5.5.2 Soybean meal and soybean oil

Increases in production and exports of soybean products such as soybean oil and soybean meal have followed increases in soybean production as shown in Fig. 5.5.3.



Source ; USDA: PS&D View , October 2001.

Fig. 5.5.3 Export volume and share of Brazil of soybean meal

Brazil's exports of soybean meal increased dramatically during the late 1960's reaching 8 million tons in 1980. The export level was maintained at this level for a while afterwards, and it reached 10 million tons in the 1990's. The reason why soybean meal exports did not increase further despite of increases in soybean production may be because soybean grain exports were more encouraged than soybean oil production initiated by the domestic policies especially in the 1980's.

In the 1990's, soybean oil production increased followed by increases in exports of soybean meal. Soybean meal exports decreased slightly in the latter half of the 1990's possibly due to enhanced domestic demand for feed by growing livestock industries inside the country. Production of livestock products has continuously increased. Livestock products add value to the raw product, soybeans, and this clearly implies that the Brazil's soybean production contributes to the domestic economy and world markets.

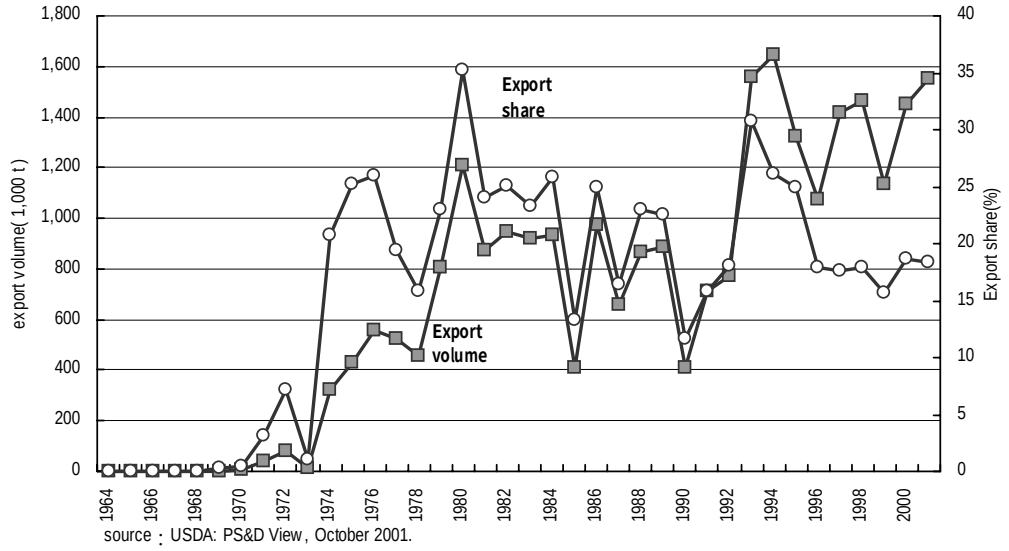


Fig. 5.5.4 Export volume and share of Brazil of soybean oil

Soybean oil exports from Brazil were stagnant at 0.8 million tons in the 1980's, decreasing to a half of that level for a couple of years, but recovering in the 1990's and reaching a record at 1.6 million tons in 1994 (Fig. 5.5.4).

Since then, however, soybean oil exports have again decreased. This may be because domestic consumption of soybean oil increased continuously during the recent years. Domestic soybean oil consumption during the last decade increased from 2 to 3 million tons. Demand for soybean oil produced in Brazil will expand domestically and for exports in the future.

5.5.3 Increases in exports of livestock products

Increases in soybean and the related products are followed by increases in production of livestock products. Increases in soybean oil is enhanced by the increases in production of soybean, but production of soybean oil generates by-products, soybean meal, which is fed to the livestock such as cattle, pork and chicken. Feedstuff factories have been developed in the Cerrado areas, giving livestock producers easier access to feed. In Paracatu, Minas Gerais, where the first Prodecer was conducted, a feed factory run by a coop opened soon after the start of Prodecer and began to provide feed at a price 5% cheaper than market prices then.

Supported by improvements of infrastructure for the livestock industry, livestock production has increased dramatically as mentioned in Section 5.4.4. Production of chicken broilers increased by 4 times from 1.5 million tons in the early 1980's to 6 million tons in 2001. Exports of broilers produced in Brazil increased from 0.3 million tons in the early 1980's and eventually reached over 1 million tons in 2001. Production

of beef also increased from 3 million tons in 1980 to 7 million tons in 2001. Exports of beef also increased to 0.65 million tons in 2001. Production of pork increased from less than 1 million tons in 1980 to over 2 million tons in 2001, while exports of pork substantially increased during the last 5 years from 30,000 tons in 1995 to 150,000 tons in 2001, an increase of about 5 times.

Shares of Brazilian livestock products in world markets during the last two decades are summarized in Table 5.5.2. The increases in production in Brazil are distinctly larger than increases observed in the neighboring country, Argentina. In Argentina, beef production has been stagnant at 3 million tons since 1980's and pork production at 0.2 million tons without a major improvement during the same period.

Table5.5.2 Exports and Shares of Soybean Related and Livestock Products from Brazil

(1,000 tons)

	Soybeans		Soybean meal		Soybean oil		Broiler		Beef		Pork	
	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports
1980												
Brazil	15,200	1,502	10,607	8,562	2,585	1,212	1,250	169	3,285	189	850	2
World total	80,873	24,514	55,385	19,868	12,584	3,434	16,116	1,157	42,921	4,528	49,422	2,840
Brazil's share	19%	6%	19%	43%	21%	35%	8%	15%	8%	4%	2%	0%
2001												
Brazil	41,500	16,900	18,350	10,900	4,450	1,550	6,055	1,050	6,645	650	2,060	150
World total	180,674	55,964	122,866	42,686	28,091	8,453	42,655	6,694	48,758	6,824	84,314	6,782
Brazil's share	23%	30%	15%	26%	16%	18%	14%	16%	14%	10%	2%	2%

Source: USDA: PS&D View, October 2001

5.5.4 Contribution to world market prices

Areas and yields in Brazilian soybean production are compared with the world largest producer, the U.S., in Fig. 5.5.5. In around 1980, soybean producing areas in Brazil were about a third of those of the U.S. Since then, soybean production in Brazil increased steadily while U.S. production was stagnant. Soybean areas in Brazil have reached a level of about half of the U.S. soybean areas. Whereas yields of soybeans in Brazil were smaller than those in the U.S. in the 1980's and 1990's, during recent years, Brazilian soybean yields have been slightly greater than U.S. yields.

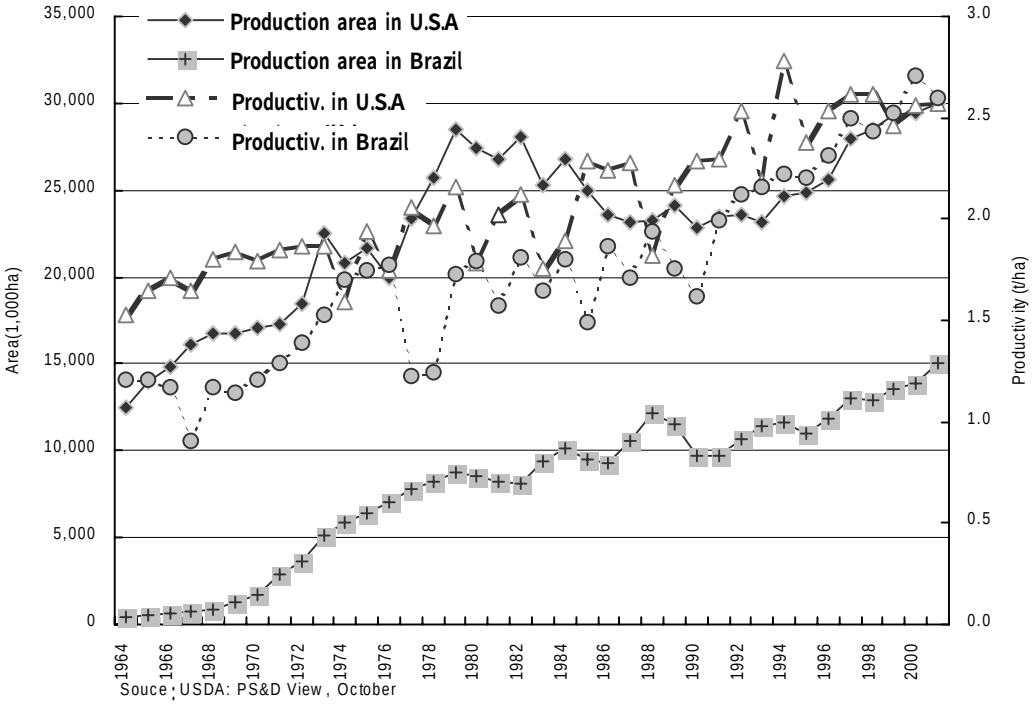


Fig. 5.5.5 Production area and Productivity of soybean in U.S.A and Brazil

Substantial increases in soybean production as well as soybean/livestock products in Brazil have greatly impacted world soybean market prices, making them cheaper and more stable for the world than ever before. As indicated in Fig. 2.2.2, real prices of soybeans in the world market during the last four decades are quite low, especiallyduring the last decade relative to the situation in the previous decades. Even in the mid-1970's when world market prices skyrocketed, soybean prices increased by only half of what rice prices increased. This may be in part due to sharp increases in soybean exports from Brazil.

After the food shortages, world prices declined. Soybean prices per metric ton are usually greater and more unstable than those for wheat and corn Since soybeans can be used more in speculative markets than wheat or corn. However, the magnitude of price fluctuation is becoming smaller and smaller during recent years and soybean market prices are steadily moving downwards. It was quite unusual for soybean prices to rise two years in a row during the last quarter century. In 1996, world soybean prices began to increase, but the situation moderated within a short period due to immediate doubling in Brazilian soybean exports relative to the previous year. This was a marvelous contribution to importing countries, and it makes a major point that importing countries can be assured of more stable and reliable world soybean markets in the contemporary era.

Source ; Oil Crops Situation and Outlook Yearbook, Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture, October 2000, OCS-2000, pp.54-59. Agricultural Prices, September 2001, p. A-12, after Oct' 2000.

Fig. 5.5.6 Monthly price movement of soybean producer in U.S.A

Monthly price movements in the world markets during 1995 and 2001 are shown in Fig. 5.5.6, and it shows that no sharp increases have occurred. Rather, the steady decline of prices during recent years is more highlighted by the figure. Increases in soybean production in Brazil, the Cerrado areas, are in part responsible for the declining prices.

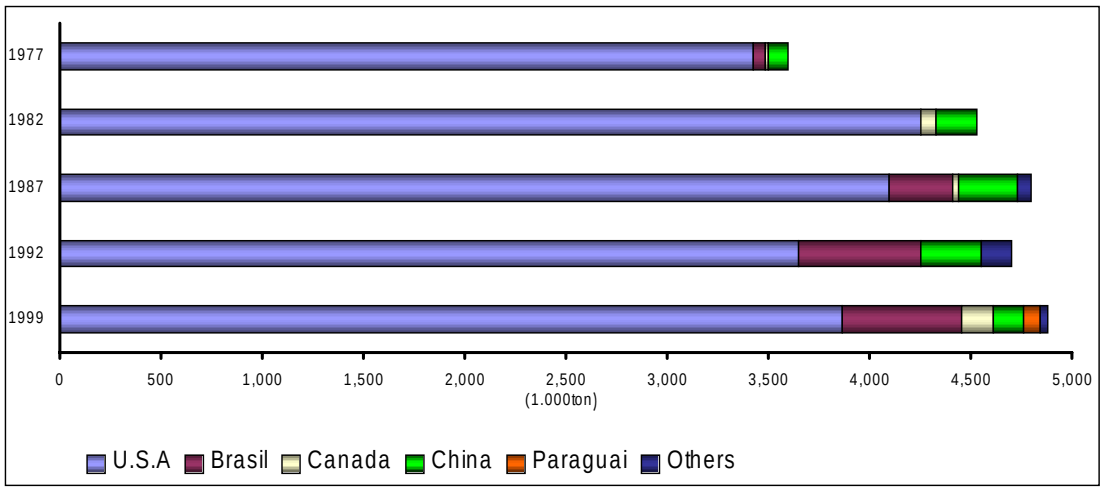
In the fall of 2000, BSE (mad-cow-disease) problems were causing chaos in Europe. Feedstuff made from bones and meat were prohibited by more countries and livestock producers shifted to soybean and soybean meal for feed. In the past in this type of situation, market prices would have surged. Now, however, without the U.S. having a monopolistic lion's share, major supplying countries such as Brazil and other exporters have contributed to stable market prices. Accordingly, responses of the market were calm and significant rise in prices occurred only for a short period. Farm prices of soybeans in the U.S. rose from US$4.50 per bushel in November 2000 to US$4.80 next month, only a 10% increase. Prices moved downwards after that.

Market prices at the Chicago Board of Trade are now very responsive to the situation in Brazil. Chicago prices each day reflect the supply/demand conditions in Brazil. Brazilian soybeans have established their status that high now. This situation of stable and increasing supply with downward prices for soybean as well as livestock products is welcomed by the international community. The benefits from this may be much larger than what one can imagine. The contribution of Prodecer, which initiated the major increases in soybean production in the Cerrado areas, may eventually be recognized as an invaluable program by international society as well as by the Brazilian people.

5.5.5 Contribution to Japan

Japan imports from Brazil just over 0.5 million tons of soybean (Fig. 5.5.7). Japan imported about almost 5 million tons each year from all over the world (mainly from the largest exporter, the U.S.) during the last decade. Brazilian soybeans account for only slightly more than 10% of total Japanese soybean imports. Accordingly, contributions of Prodecer appear to be quite small.

However, dramatic increases in soybean production in Brazil originating from the Prodecer projects have contributed to stable and lower world market prices for soybeans. This is a great benefit for soybean importing countries such as Japan. Imagine how much more an importing country would have to pay in case Brazilian soybean production were only half of their actual production level. It is expected that soybean production in the Cerrado areas will continue to increase in the future. Therefore, the current downward movement of market prices will also continue, and importing countries like Japan will continue to receive increasing benefits.



Source: "monthly data of Japanese trade"

Fig. 5.5.7 Main origin kind of imports of Japan of soybean

During the survey in the Cerrado areas in 2000 and 2001, soybean producers complained about lack of visits from Japanese trading companies. It was a strong disappointment for producers who moved to Cerrado areas with Prodecer programs in which Japan was the major contributor. It is ironic to listen to the gossip saying "Japanese projects have been successful in agriculture in Cerrado, but no Japanese company is involved to deal with the products."

Brazil is located completely on the opposite side of the globe from Japan, yet Brazil has contributed significantly to lower world soybean market prices. However, with those

lower prices, each producing country needs a strong relationship with an importing country. In order for a better international market situation regarding widened supply resources to avert risks in the future like natural disaster and attacks from the terrorists, Japanese involvement for more imports of Brazilian soybeans may become more important for Japan's own sake.