

Agrofuels and food crisis

In the current global context we are confronting the convergence of the food crisis, the climate crisis, the energy crisis and the financial crisis. These crises have common origins in the capitalist system and more recently in the unrestrained de-regulation in various spheres of economic activity, as part of the neo-liberal model, which gives priority to business and profit. In the rural zones of the world, we have seen a ferocious offensive of capital and of transnational corporations (TNCs) to take over land and natural assets (water, forests, minerals, biodiversity, land, etc.), that translates into a privatizing war to steal the territories and assets of peasants and indigenous peoples. This war uses false pretexts and deliberately erroneous arguments, for example to claim that agrofuels are a solution for the climactic and energy crises, when the truth is exactly the opposite. Whenever peoples exercise their rights and resist this generalized pillage, or when they are obliged to join migrant flows, the response is always more criminalization, more repression, more political prisoners, more assassinations, more walls of shame and more military bases. Declaration of Maputo, La Via Campesina, 23 October 2008¹

Agrofuels must be considered within the context of the world food price crisis if we are to evaluate their likely impact, and we should judge their compatibility with food sovereignty, proposed by farmer organizations as the solution to the food crisis. In fact, in today's world we not only face a food crisis, but rather interlocking crises of the climate, energy, food and finances. All of these crises are products of the world capitalist system and neoliberal deregulation of markets. Agrofuels are related to all facets of this multidimensional crisis. They have been posited as the solution to the energy and climates crises, dubious claims which are addressed elsewhere in this issue, and they certainly are part of the financial crisis. "After the mortgage crisis, investors needed a new place to put

their money. So they pumped it into commodities, farmland, and the new biofuels boom...”, according to the Institute for Food and Development Policy and other analysts (Gordon, 2008).

1. THE WORLD FOOD PRICE CRISIS AND FOOD SOVEREIGNTY

It is the relationship of agrofuels to the food price crisis that we examine in this essay. In today's world we find ourselves mired in a global food price crisis that is driving increased hunger and even food riots in several continents. It seems odd that we are in crisis of high food prices, when the past twenty to thirty years have seen a crisis of *low* prices, prices so low that millions of peasant and family farmers around the world were driven off the land and into national and international migrant streams. To confront that harsh reality, La Via Campesina, the international alliance of organizations of peasant and family farmers, farm workers, indigenous people, landless peasants, and rural women and youth, developed a comprehensive alternative proposal for restructuring food production and consumption at the local, national and global level, called “food sovereignty”.

Under food sovereignty, and in contrast to the “one size fits all” proposals of the World Trade Organization (WTO), every country and people is deemed to have the right to establish its own policies concerning its food and agriculture system, as long as those policies don't hurt third countries, as has been the case when major agroexports powers dump foodstuffs in the markets of other countries at prices below the cost of production, thus driving local farmers out of business (Rosset, 2006). Food sovereignty would allow countries to protect their domestic markets against such practices. But now that we have shifted from a period of artificially low prices, to a period of high prices, or more accurately, more *volatile* prices, does food sovereignty still make sense? An examination of the causes of the current crisis, which turn out to be not so different from the previous crisis, show that it indeed does. In fact food sovereignty may well offer our only way of the current conundrum.

But, what are the causes of the extreme food price hikes? ² There are both long term and short causes. Among the former, the cumulative effect

of three decades of neoliberal budget-cutting, privatization and free trade agreements stands out. In most countries around the world, national food production capacity has been systematically dismantled and replaced by a growing capacity to produce agroexports, stimulated by enormous government subsidies to agribusiness, using taxpayer money.

It is peasants and families farmers who feed the peoples of the world, by and large. Large agribusiness producers in most any country have an export “vocation.” But policy decisions have stripped the former of minimum price guarantees, parastatal marketing boards, credit, technical assistance, and above all, markets for their produce. Local and national food markets were first inundated with cheap imports, and now, when transnational corporations (TNCs) have captured the bulk of the market share, the prices of the food imports on which countries now depend have been drastically jacked up (Rosset, 2006).

Meanwhile the World Bank and the IMF have forced governments to sell off their public sector marketing board and parastatal enterprises that maintained grain reserves. The result is that we now face one of the tightest margins in recent history between public food reserves and demand, which generates both rising prices and greater market volatility. Food inventories are now largely in the hands of the private sector, usually foreign corporations, which behaves in an inverse fashion to the public sector when a crisis emerges. As prices rise, private merchants withhold stocks from markets, in order to artificially drive prices higher before selling.

This is hoarding and speculation, and has been the *modus operandi* of private grain merchants from biblical times to present day companies like Cargill, Archers-Daniels-Midland and Bunge. This was the case with the so-called “tortilla crisis” in Mexico in 2007 (Hernández Navarro, 2007). The public sector, on the other hand, does the reverse, releasing stocks as prices rise in order to ameliorate prices hikes and allow the poor to continue eating, thus averting famine. Although parastatal grain marketing boards were corrupt and inefficient in many cases, selling them off has proven to be a cure worse than the disease; they should have been reformed instead (Rosset, 2006).

In other words, many countries no longer have either sufficient food reserves or sufficient productive capacity. They now depend on imports,

whose prices are first skyrocketing, then dropping, then perhaps skyrocketing again. Another long term cause of the crisis, though of far lesser importance, has been changing patterns of food consumption in some parts of the world, like increased preference for meat and poultry products (Ray, 2008).

Among the short term causes of the crisis, by far the most important was the relatively sudden entry of speculative financial capital into food markets, followed by their at least partial exit. Hedge, index and risk funds have invested heavily in the futures markets for commodities like grains and other food products. With the collapse of the home mortgage market in the USA, their already desperate search for new avenues of investment led them to discover these markets for futures contracts. Attracted by high price volatility in any market, since they take their profits on both price rises and price drops, they bet like gamblers in a casino. Gambling, in this case, with the food of ordinary people. These funds injected an additional 70 billion dollars of extra investment into commodities, inflating a price bubble that has pushed the cost of basic foodstuffs beyond the reach of the poor in country after country.

More recently commodity prices have begun to drop, as the fund have been hard hit by the financial crisis, although the most likely scenario now is that prices will follow wild swings as derivative investors bet on both up- and down-swings. When crop commodity prices rise, consumer prices follow suit, but when commodity prices drop, consumer prices stay high, thus hurting both farmers and consumers. Furthermore, farmers scarcely benefited when prices rose, as most of their harvests were sold at lower prices and thus grain trading corporations made windfall profits (Hernández Navarro, 2008).

The major global price increases in the costs of chemical inputs for conventional farming, particularly fertilizers, as a direct result of the high price of petroleum, were also a major short term causal factor, although fertilizer prices began to fall more recently. Other factors of recent impact include droughts and other climate events in a number of regions, and a tendency of transnational corporations to export needed foodstuffs from certain countries in search of better prices, exacerbating local shortages.

There is no doubt that the agrofuel boom is a contributing factor in the food price crisis. While not yet a dominant causal factor - so far

these have been the dismantling of productive capacity, privatization, hoarding and speculating with reserves, trade liberalization and the role of speculative financial capital -, demand for agrofuels can only exacerbate the crisis.

Governments argue that many agrofuels are to be produced from crops which are not human foods, and therefore they make the claim that in such cases food for cars (agrofuels) does not in fact compete with food for people. This is patently false, as the area to be planted to these biomass crops often comes from areas that would otherwise be devoted to food production. Furthermore, when biomass crops are planted on marginal soils, they often compete even more with food production, as the expansion of agroindustry on the most fertile lands of most countries has driven peasant and family farm food producers precisely into those marginal areas now slated for agrofuel production. Finally, second or third generation agrofuels using cellulosic technologies to turn normally non-harvested crop residues into agrofuels, will also damage food production. This is because the non-edible portions of food plants like maize should be incorporated into the soil after harvest in order to maintain soil fertility. If instead they are harvested and sent to ethanol factories, we are likely to see a steep decline in soil fertility and a resulting drop in food crop yields (Science Daily, 2008). Agrofuels are clearly not the right policy direction for a world faced with a food crisis. We can use Brazil as a case in point.

2. AGROFUELS IN THE CONTEXT OF THE FOOD CRISIS: THE CASE OF BRAZIL

Brazil has the potential to become a major exporter of biofuels. The expansion of monocropping as soybeans and sugarcane for the production of agrofuels, in addition to environmental degradation from the indiscriminate use of natural resources, tends to increase food prices and consolidate an agricultural model based on high exploitation of workers and dependence on TNCs. As a consequence, agrofuels dominate some of the best agricultural lands in Brazil, replacing food production and reaching protected areas of the Amazon and Cerrado.³

Brazilian government has targeted the Cerrado as a priority area for advancing the agricultural borders, as this region is characterized by favorable topography and is known as the “father of water,” for it fills up the principal water basins of the country. With nearly two million square kilometers, this biome is located between the Amazon, the Atlantic Rainforest, the Pantanal, and the Caatinga. The region, as important for its biodiversity as the Amazon, is shelter for nearly 160,000 species of plants and animals, many of which are endangered species. However, its destruction has not generated much visibility, in spite of the intensity and the consequences it has caused. Antônio Thomaz Júnior, professor of the Department of Geography of the State University of São Paulo (Unesp), states in an interview that “the expansion of sugarcane in Brazil for the production of ethanol may certainly advance over areas currently cultivating food crops, besides placing at risk the integrity of important biomes, like the Amazon and Pantanal.”⁴

In the 2007 harvest, sugarcane production occupied 5.8 million hectares of the Cerrado, according to the Brazilian Institute of Geography and Statistics (IBGE). To begin planting sugarcane, it is necessary to clear the native vegetation, and thus all of the trees are uprooted. Studies indicate that each year nearly 22,000 square kilometers of savannah are cleared. A report from the Society, Population and Nature Institute (ISPN) affirms:

Deforestation done for sugarcane production directly harms rural populations who survive off the biodiversity of the Cerrado. The other terminal consequence is that small food farmers leave their lands, having been lured into temporary employment in the sugarcane fields. This will diminish the food production in the area, which only serves to aggravate the migration to urban slums.”⁵

In August 2008, an agreement between the Ministry of the Environment and the Ministry of Agriculture resulted in a series of modifications in the “Law of Environmental Crimes”, including one that allows the construction of sugarcane factories in the Pantanal.

Another concern that affects in a direct way the cost of food is the demand for water in agrofuels production. The director of the Scientific Committee of the Stockholm International Institute for Water, Jan Lundqvist, warns that

Currently the quantity of water used throughout the world in food production is approximately 7,000 km³. In 2050, the prediction is that this quantity will increase to 11,000 km³, almost double of what it is today. And the projections indicate that the demand of water necessary to produce biofuels will increase in the same proportions as the demand of water for food production, which would represent 20 -30 km³ of water in 2050. ⁶

Even in areas where there was already agricultural activity, sugarcane monoculture produces a much larger degree of devastation, because it substitutes diversified agriculture for homogeneous and continuous cultivation, which leads to the total destruction of forest reserves. The demand of ethanol corporations for large quantity of good quality lands, with access to water and infrastructure, results in the devastation of natural resources and local agriculture. So, it is not true that sugarcane plantations are expanding in degraded areas and marginal lands, as the Brazilian government claims.

It's illustrative to listen to the people who live at the town of Lagoa da Prata, state of Minas Gerais, where a sugarcane mill already existed since the 70's.⁷ Recently, the French company Louis Dreyfus acquired this mill, and expanded its plantations to produce ethanol, replacing areas of food production, besides destroying forest reserves.

According to farmer Gaudino Correia, it is not worth to lease out the land to the ethanol factory.

The contracts are for 12 years, and after that the sugarcane has destroyed everything. The mill uses heavy machines to prepare the land, and it causes soil erosion. They burn sugarcane, and the ashes spread throughout the region. I did not want to lease out my land, and now I'm surrounded by sugarcane. Here there is no more land for farming, and therefore food prices have raised a lot. My neighbours have stopped producing corn, beans, coffee, and milk, and leased out their lands. I still plant corn, beans, and produce milk, but for small producers the price did not increase, only for the middleman and for consumers.

Farmer Sebastião Ribeiro has the same opinion. "The company insisted, but I didn't want to lease out my land. My neighbours who did it ended up getting into depression, because it is the same as if you lose your land. What will happen if all farmers stop planting food crops?" He also explains that the companies use the water of the São Francisco River to irrigate sugarcane.

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Local organizations are concerned with the environmental and social impacts of agrofuels production. “The government should give priority to the preservation of the rivers springs. It is like wearing the veins that lead the blood to the heart. This expansion is happening very fast, and the production of sugarcane is supposed to double in the region. Family farming is going to disappear, and foods can become scarce”, says Lessandro da Costa, director of the Environmentalist Association of Alto São Francisco. The president of the Rural Workers Union of Lagoa da Prata, Nelson Rufino, explains that most of the workers in the agroindustry are migrants, so they are more vulnerable to exploitation and prejudice.

The mills spread poison by airplane, and the number of cases of cancer in the population is enormous... there are more than 140 workers removed from their jobs because of health problems... We have registration of five death cases from accidents at work... For the workers the situation has worsened because we have lost income.

The Minister of Agriculture Reinhold Stephanes affirms that the expansion of sugarcane plantations happens on land that is “degraded,” and there are no impacts on the environment or on food production. The data given to justify this assertion is based in the idea that in Brazil there are millions of hectares of land “abandoned” or “marginal.” On the other hand, the government has yet to explain what exactly it means by “degraded land”. It would not make sense for companies and public banks to heavily invest in a sector in which there is no possibility to plant on level ground, of good quality land, with access to water and infrastructure. Even when sugarcane production replaces other agricultural activities, or even cattle-raising, there is a much greater degree of devastation because large-scale sugarcane plantations do not thrive with other types of vegetation. If there really were so much land available in Brazil, there would not be necessary to expand ethanol production to preserved areas.

In fact, the cultivation of sugarcane comes near to restricted conservation zones of the Serra da Canastra National Park, considered of extreme biological importance by the Atlas of Biodiversity in Minas Gerais. Referring to the mill’s activities, Joaquim Maia Neto, chief of Brazilian Environmental Institute (IBAMA) at the Park, affirms:

They plant sugarcane practically inside the water. The company deforested and burned the area, and it was a major threat for the whole region. The Public Prosecutor's Office filed a lawsuit against the company. We hope that the area will be restored soon, and that the company be punished because of environmental crimes. This activity brings serious environmental problems. Brazil should prioritize a diversified model of agriculture.

The National Supply Company (CONAB), an organ linked to the Ministry of Agriculture, registered an increase in the production of sugarcane in the Amazon from 17.6 million tons to 19.3 million tons between 2007 and 2008.⁸ In 2006, CONAB demonstrated that the Northern region had the highest indices of increase in sugarcane production in the country. The expansion was 68.9% in Tocantins, 55.1% in Amazonas and 34.3% in Pará. The production from these three states was 1.6 million tons, representing an increase of 46.8% in relation to the previous harvest.⁹ Official data from IBGE indicates that cattle-raising in the Amazon has practically doubled in the last ten years, pushing for the expansion of the agricultural borders. The 2006 Farming Census showed that since 1996 the increase in agricultural expansion in the Northern Region was 275.5%. Between 2006 and 2007, the soy harvest in the Northern Region had a 20% increase.¹⁰

In Brazil, the increase in ethanol production has caused the expulsion of small farmers from their lands, and has generated a dependency on the so-called "sugarcane economy," where only precarious jobs exist in the sugar fields. Large landowners' monopoly on land blocks other economic sectors from developing, and generates unemployment, stimulates migration, and submits workers to degrading conditions. Despite propaganda about "efficiency," the ethanol industry is based on the exploitation of cheap labor and even slave labor. This pattern of exploitation has caused serious health problems and even death of workers. The causes of these deaths include assassinations, accidents, and illnesses. According to International Labor Organization (ILO), in 2007, public attorneys rescued 288 workers in slave conditions at six plantations in São Paulo, 409 workers in the sugarcane fields at the ethanol plantation Centro Oeste Iguatemi, state of Mato Grosso do Sul state, and 1108 workers in the sugarcane plantation Pagrisa (Pará Pastoril e Agrícola S.A.), municipality of Ulianópolis (state of Pará), in the Amazon region.

As a matter of fact, the debate on the production of agro-energy involves a wide range of themes, centered on the agricultural and economic model adopted by peripheral countries and in a process of “recycling” in the discourse that defines the geopolitics of central countries. In this context, the Brazilian government assumes a protagonist role in defense of the expansion of monocropping for the production of agro-energy. Currently, the priority of Brazilian foreign policy is to guarantee access to markets for agrofuels, principally in the European Union, Japan, and the United States, in addition to encouraging other countries in the Southern Hemisphere to adopt this production model, by means of technology transfer agreements.

Opting for an agricultural model that prioritizes monocropping for export is based on the idea that implementation of full agrarian reform would not be significant for rural development in Brazil. As Manuel Correia de Andrade (2005) observed, the processes of rural exodus are based on the image of urban centers as the chief generators of income and economic opportunities.¹¹ However, the major regions in which natural resources are concentrated—such as water, land, minerals, and biodiversity—are in the rural environment and have come to be the center of the principal political and economic disputes, both nationally and worldwide. Multilateral financial agencies, large national and transnational firms, and governments dispute geopolitical control of regions rich in strategic resources, both agricultural and mineral energy-related.

To justify this option, it would be necessary to “extinguish” the idea of the importance of supporting agrarian reform and family farms, as policies central to rural development. During the Fernando Henrique Cardoso administration, agrarian reform policy was replaced by a project called “The New Rural World,” basically centered on three principal assumptions: settling of landless families under a compensatory social policy; “decentralizing” agrarian reform projects, passing responsibilities inherent to the federal government to states and municipalities; replacement of the constitutional instrument on expropriation by a “land market” policy, which signifies negotiated purchase and sale of land. This concept of “development” was encouraged by the World Bank, through the creation of three programs: the Land Title, the Land Fund, and the Land-Based Poverty Alleviation Project. In spite of this ideology being based on the

propaganda of minimum State, the World Bank demands a share of public funds in its projects, which compromises the State's budget and defines a land ownership policy based on privatization of land. In accordance with this policy, small farmers must seek "efficiency" by means of integration with the agro-industrial complex (Martins, 2004).

Currently, the Brazilian agro-industrial complex is joining the ranks of "globalized" capitalism, characterized by large agricultural and industrial monopolies, under a strong influence from financial capital (Oliveira, 1998), as well as the rules of international financial institutions, such as the World Trade Organization (WTO). Since its creation in 1995, the principal role of the WTO has been to expand its regulatory power in 147 countries, which means exercising a great influence in the daily lives of millions of people. In spite of spreading the ideology of "free trade," the WTO has a complex structure of rules used in defense of the interests of multinational corporations and their headquarter countries. The scope of the agreements contained in the WTO greatly exceeds the subject matter of international trade. In Brazil, agricultural policies follow this logic, with a view principally to expanding access to markets and consolidating commercial advantages for the agricultural sector based on monocropping for export. In accordance with this ideology, the big "villain" is public subsidy for food production, but there is no questioning of the problems caused by agricultural monopolies, and by a production model looking toward the external market.

Contrasting with the propaganda of the agro-industrial complex as a symbol of "development" and "efficiency," the land ownership and agricultural model of this sector creates serious social and economic inequalities, besides being highly dependent on public resources. Some of chief consequences of this policy are environmental degradation, concentration of income, and unemployment in rural areas. This process was identified by Alberto Passos Guimarães (1978:22) as the "conservative modernization of Brazilian agriculture". According to Ariovaldo Umbelino Oliveira (2007: 7028), professor at the University of São Paulo, of the total jobs created in the Brazilian countryside, 87.3% are in the small production units, 10.2% in mid-sized units, and only 2.5% on the large ones.¹² His study demonstrates that the small and mid-size rural properties are responsible for the greater portion of food production for local markets. The

2006 Agrarian Census by IBGE reveals that properties of less than 10 hectares occupy less than 2.7% of the rural area, while properties larger than 1,000 hectares represent 43% of the total.

3. FOOD SOVEREIGNTY: THE ONLY WAY OUT OF THE CRISIS

It is impossible to examine this and similar case around the world and not see the implications of agrofuels on the food crisis. Faced with this global panorama, there is really just one alternative proposal that is up to the challenge. Under the Food Sovereignty paradigm, social movements and a growing number of progressive and semi-progressive governments propose that we re-regulate the food commodity markets that were deregulated under neoliberalism. And regulate them better than before they were deregulated, with genuine supply management, making it possible to set prices that are fair to both farmers and consumers alike, as outlined in Table 1 (Rosset, 2006).

Table 1. Food sovereignty policies to address the global food price crisis

- Protect domestic food markets against both dumping (artificially low prices) and artificially high prices driven by speculation and volatility in global markets.
- A return to improved versions of supply management policies at the national level and improved international commodity agreements at a global level
 - Recovery of the productive capacity of peasant and family farm sectors, via floor prices, improved marketing boards, public sector budgets, and genuine agrarian reform.
 - Rebuild improved versions of public sector and or farmer-owned basic food inventories, elimination of transnationals and the domestic private sector as the principal owners of national food stocks.
 - Controls against hoarding, speculating and forced export of needed foodstuffs.
 - An immediate moratorium on agrofuels.
 - The technological transformation of farming systems, based on agro-

ecology, to break the link between food and petroleum prices, and to conserve and restore the productive capacity of farm lands.

That necessarily means a return to protection of the national food production of nations, both against the dumping of artificially cheap food that undercuts local farmers, and against the artificially expensive food imports that we face today. It means rebuilding the national grain reserves and parastatal marketing boards, in new and improved versions that actively include farmer organizations as owners and administrators of public reserves. That is a key step toward taking our food system back from the TNCs that hoard food stocks to drive prices up.

Countries urgently need to stimulate the recovery of their national food producing capacity, specifically that capacity located in the peasant and family farm sectors. That means public sector budgets, floor prices, credit and other forms of support, and genuine agrarian reform. Land reform is urgently needed in many countries to rebuild the peasant and family farm sectors, whose vocation is growing food for people, since the largest farms and agribusinesses seem to only produce for cars and for export (Rosset et al., 2006). And many countries need to implement export controls, as a number of governments have done in recent months, to stop the forced exportation of food desperately needed by their own populations.

Finally, we must change dominant technological practices in farming, toward an agriculture based on agro-ecological principles, that is sustainable, and that is based on respect for and is in equilibrium with nature, local cultures, and traditional farming knowledge (Altieri, 2008). It has been scientifically demonstrated that ecological farming systems can be more productive, can better resist drought and other manifestations of climate change, and are more economically sustainable because they use less fossil fuel. We can no longer afford the luxury of food whose price is linked to the price of petroleum (Schill, 2008), much less whose industrial monoculture production model - with pesticides and GMOs - damages the future productive capacity of our soils. Clearly, we need an immediate moratorium on agrofuels.

All of these recommendations, which address each of the major cause of the crisis, are part of the food sovereignty proposal (La Via Campesina, 2008). The time seems to have truly arrived for La Via Campesina and for Food Sovereignty. There is no other real solution to feeding the world and it is up to each and every one of us to help force the changes in national and international public policy that are so urgently needed.

NOTES

¹ La Via Campesina. 2008. Declaration of Maputo: V International Conference of La Via Campesina. Accessed on 12 November 2008 at: http://www.viacampesina.org/main_en/index.php?option=com_content&task=view&id=623&Itemid=1

² The assertions in this section that do not include bibliographic citations come from: Berthelot, 2008; La Via Campesina, 2008; GRAIN, 2008.

³ See Maria Luisa Mendonça, Isidoro Revers, Marluce Melo and Plácido Júnior, *Impactos da produção de cana no Cerrado e Amazônia* [Impacts of the production of sugarcane in the Cerrado and the Amazon], published by The Pastoral Land Commission and the Network for Social Justice and Human Rights, December 2008.

⁴ *Cana pode prejudicar meio ambiente e produção de alimentos* [Cane may harm the environment and food production], *Repórter Brasil*, April 4, 2007 <http://www.reporterbrasil.com.br/exibe.php?id=984>

⁵ *Cana coloca em risco o cerrado brasileiro, O Estado de São Paulo*, December 3, 2007

⁶ BBC Brasil, Biocombustível causaria falta de água [Biofuel could casue water shortage], August 13, 2007.

⁷ The field research and interviews in Minas Gerais were done by Maria Luisa Mendonça, between March and April 2008.

⁸ Cited in Frei Betto, *Amazônia, ecocídio anunciado* [Amazonia, Ecocide Announced]. Adital, February 11, 2008.

⁹ *Jornal Valor Econômico*, June 1, 2006.

¹⁰ Radioagencia Notícias do Planalto, May 5, 2008.

¹¹ In *A Terra e o Homem no Nordeste*, Manuel Correia de Andrade (2005: 62) uses the expression “*cidade inchada*” (swollen city) coined by Gilberto Freyre to describe this process, and to point out that “considerable increase in population, without a corresponding increase in employment possibilities, is more of a swelling than it is a growth.” He explains: “We believe that one of the causes which most contributes to aggravating this problem is the dominant land ownership structure which has been in place since colonization”.

¹² Conference on May 29, 2006 at the State University of Paraná. Text available at:

e-revista.unioeste.br/index.php/pgeografica/article/download/1284/1038.