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Productive forces in new extractivism on Paraguayan  
associated development

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## Productive forces in new extractivism on Paraguayan associated development

Ramón Fogel<sup>1</sup>

### Abstract

*The paper analyses the impact of new extractivism in Paraguay impelled by the globalized economy and with the active intervention of Brazilian agrarian bourgeoisie. The work emphasizes the socio political and environmental consequences of productive forces expansion in agribusiness with the production of transgenic soybean and cattle raising which increases productivity requiring more land but few workforce.*

*The transformations, the operating forces and their consequences vary if it is regarding soybean or cattle raising. The transgenic soy is the main product of the new extractivism and with other GM crops point Paraguay as first country producer of transgenes. In 2014 it accounted 62% of the cultivated area in the country but with the associated crops it occupied more than 80% of that acreage. In the remarkable expansion of soybean the production phase is basically controlled by Brazilians who monopolize the best land suitable for agriculture but are subordinate to the large biotech corporations that control technology, processing and marketing, while the production of raising cattle is controlled in all its phases by Brazilian businesses, also grabbing lands suitable for livestock.*

*The technological package of soy increases scales of production needs associating greater profitability with largest expanses of land. The increasing boundless usage of phosphorous agro toxics are damaging human health, environment and it is contaminating the giant Guaraní Aquifer which is shared with Brazil. This technology in addition to razing the natural resources is carrying the seeds of their own destruction as it associates increasingly powerful herbicides with the gene-splicing it develops resistance in some weeds that can no longer be controlled, what will influence the systematic collapse of the crop yield. This advance in agribusiness intensifies the separation of the peasants from their livelihoods without causing their proletarianization; the acquisition of more land for soy is given in a process of accumulation by dispossession with active participation of the State, both the Paraguayan which is controlled by the ruling classes as for the Brazilian who protects the expansion of its economy.*

*In cattle raising there is no subordination of the Brazilian capital to the transnationals as the Brazilian fridges control over 70 % of the industrialization at a global level. One of these companies is JBS which illustrates bribery practices. As well as others that operate in Paraguay had received financial support from the Brazilian government to facilitate its expansion. At the same time Oligarchy expresses concern about monopoly of the meat industry.*

*The class struggle in Paraguay is rural and it weakened with the massive expulsion of the peasants from their lands. The conservative alliance which controls the State, refers to the peculiar structure of classes that articulates a prebendary social formation, as it is not just a matter of the agricultural classes.*

*The paper uses the categories of historical materialism; the interrelationships between the economic and the political considers secondary data of the last 15 years.*

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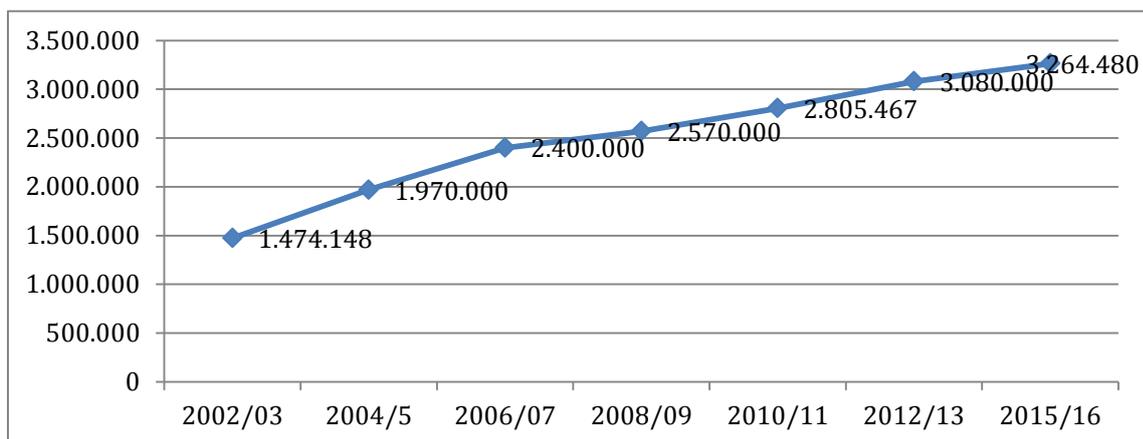
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## 1 Neo extractivism and soybean production.

Agribusiness was one of the starting points of the over accumulation crisis of global capitalism; before the fall of profits the owners of the capital need means to absorb the surplus and the available outlet was the spatial expansion (Harvey, 2004)<sup>2</sup>. In the Paraguayan case, transgenic soybean is the emblematic crop, and in its production genetic engineering techniques are used recombining the DNA of seeds; unlike classical extractivism that relied exclusively on large transnational corporations, the new stamp in the production phase rests primarily on enterprises owned by individuals while large corporations control technology, the provision of supplies, processing and marketing.

This expansion of soybean production is such that between 2002/03 and 2015/16 crop years the cultivated area increased by 2.2 to 3,264,480 hectares, totaling 9,216,937 tons in the last crop year (Figure 1); this intense soybean production responds both to the crisis of over accumulation of capital as well as to the increase in demand of international market. In order to measure the importance of the referred data should be noted that the production of GM is not limited to soybean, which with other GM crops cover 3.6 million hectares; although it is true that in the world ranking, Paraguay is the sixth country considering cultivated surface, after United States, Brazil, Argentina, Canada and India, whereas the proportion of the total area occupied by GM our country is the largest adopter of GM crops and to that extent the most exposed to the effects of their production<sup>3</sup>.

**Figure 1. Expansion of cultivated soybean area**



Source: CAPECO 2017

In recent years, in the period between 2012 and 2016, the economy grew by 6.5% per year; the contribution of agriculture to GDP is close to a quarter, while exports to GDP ratio reaches 36% in 2014; considering the composition of exports 68% of them are primary products (agriculture and livestock), fact that makes the national economy very vulnerable to economic external conditions, particularly to the instability of commodities price.

The economy based on exploited natural resources with a short term vision which only seeks to maximize revenue at the expense of sustainability is one of the great challenges of Paraguayan society, and it is closely associated with the expansion of agribusiness.

Also, big companies rice producers are part of agro business and are in full expansion; a case that illustrates the conditions of its inclusion in the agrarian structure and that gained notoriety in the firsts

<sup>2</sup> Over accumulation in a territory usually involves surplus labor or merchandise that may not be accomplished in the market without losses, as well as a surplus of financial capital without exit via investment in the territory (Harvey, 2004).

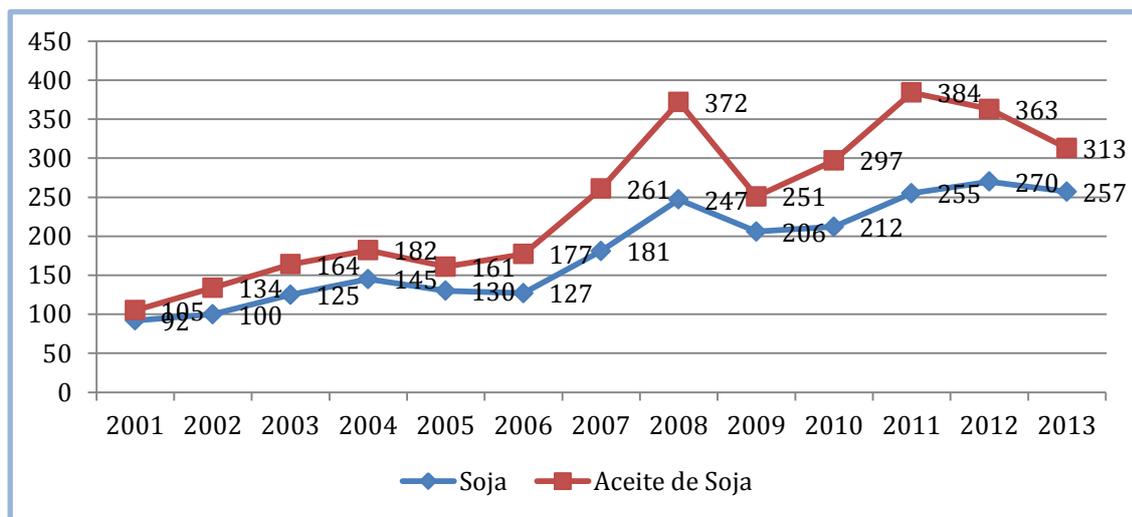
<sup>3</sup> See ISAA International Service for Agricultural Biotechnology Applications, Monsanto, quoted by Ultima Hora 16/05/2017.

months of the 2017 is that of the rice producer of Villa Oliva (Ñeembucú) of recent implantation that now operates 6,000 hectares and plans to double the area under cultivation; in the first phase of the production process eliminates the biomass by burning it, and then uses fumigation with Roundup herbicide.

The exploitation of natural resources that is intensifying in recent years strengthens the proposal of economic growth based on exports; even though the increase in the currency associated with higher yields has peculiarities of all enclave economy; the increase of exports means more currency, which according to proponents of the theory of the spill finally reaches everyone; critics to the referred theory rather assume that growth entails the increasing socio-economic asymmetries (Rodríguez, 2017).

Various are the factors explaining the modalities of the expansion of agribusiness in the case of Paraguay, thus considering institutional aspects highlight the high levels of corruption and the weight of the oligarchy in the control of the State; to the quality of natural resources external factors are added to them. In this regard according to the favorable conditions of the international market the substantial increase in the demand for seed of soybean and soybean oil, as well as other commodities, should be taken into account as reflected in the distribution of Figure 2, showing the sharp rise in prices paid between 2002 and 2013 which is multiplied by more than three in the case of soybean oil.

**Figure 2. Price indices of soybean and soybean oil in the international market, 2001-2014 (index 2000 = 100)**



Source:  
 United Nations, UNCTAD, STAT 201

4 (Statistical Annex)

The remarkable increase in the demand for commodities, linked to troubled and uncertain neoliberal globalization, which prompted the expansion of soybean agribusiness, is altered from 2015, and does not loom a short-term recovery of previous levels. Certainly the route of these markets becomes uncertain.

## 2 Retraction of peasant sector and the reconfiguration of agrarian structure

Paying attention to the reconfiguration of the agrarian social structure shows that one of the most important consequences of the expansion of agro soybean business is the remarkable shrinkage of peasant agriculture, and that was already visible in the 2008 year of the last agricultural census. In that year peasant agriculture had clearly differentiated strata, on the one hand 117,229 productive units had registered, that is nearly half of the total number of peasant farms, they had less than 5 hectares with

an average of 2.03 hectares; taking into account that it's worn out soils it can be assumed that these peasant holdings, except the intensive use of labor force in horticultural production like in the sweetener *Stevia rebaudiana* (ka'a he'ë) had no chance of adequately cover the subsistence with what was obtained in the production of the plot they hold (Table 1); this layer does not have conditions to retain the family labor force.

**Table 1. Distribution of agricultural farms according to size. 2008**

Farms Size (hectares)	Number of holdings	% of holdings	Area (hectares)	% of total area
Less than 4.99	117,229	40.6	238,012	0.76
5.00-9.99	66,218	22.9	416,702	1.34
10.00-19.99	57,735	19.9	685,381	2.20
20.00-49.99	22,865	7.9	619,986	2.00
50.00-99.99	6,879	2.3	459,555	1.50
100.00- 999.99	13,222	4.5	4,109,633	13.20
1,000.00-9, 999.99	4,127	1.4	11,902,565	38.29
10,000 and more	600	0.2	12,654,779	40.70
Total	289,649	100	31,086,894	100

Source: MAG 2009.

The next stratum of holdings coming to 66,218 farms has an average area which is less than 7 hectares and also operates in very precarious conditions in terms of the basic means of production which is the land. The process of pulverizing the minifundios recent years has further reduced the size of these plots, which account for 63.5% of the total of rural productive units.

The peasant population, which holds 20 hectares and less, accounts for more than 80% of the so-called Peasant Family Agriculture (PFA), and despite internal differentiation shares common traits. Although that sector until the beginning of the 80s of last century contributed substantially to the total exports it is now mostly confined to marginal soils on sprayed plots, having decreased the cultivated area by farmers from 685,056 hectares in 2002 to 339,525 in 2014 (Ortega 2016), which is equivalent to a loss of more than 50% in ten years. Certainly viable land-based farmer actor is endangered. In a fulminating process agribusiness moves forward by expelling peasants and indigenous people and communities.

Even if such small-scale farming contributes to community cohesion, reproduces environmental resources and promote organic farming and a healthy food system, it is disqualified as an archaic and obstacle to development in biased view of agribusiness and considered non-viable in public policies which provides little technical assistance and focuses more in crops than in productive units.

At the emerging context the peasantry is going reconfigured, turning in marginal areas; this stratum of producers of subsistence which would have been paid by other rural units remained, as we shall see, with this option substantially decreased with the diminished experienced by the sector as a result of the expansion of soybean agribusiness. In that scenario the State identifies the peasant farmer actor as an object of welfare policies in ways of disappearing.

The changes already commented on as a result of the process of concentration which is intensified since the mid 90's, as you may notice examining changes during the inter-census period 1991-2008 on the one hand indicates is the remarkable expansion of the agricultural frontier, and on the other the decrease of less than 200 hectares farms has in quantity and area, in contrast to larger size farms that

grew in number and area (Table 2). Thus, between 1991 and 2008 the total number of farms decreased by 6%. The stratum of less than 200 hectares farms which includes peasant productive units decreased in quantity and in the occupied area (15.6%). At the other end more than 500 hectares farms have increased in number and area (Table 2). The area occupied by enterprises with more than 100,000 hectares have they totaled 600 and was increased by 30% in the inter-census period.

With the modalities in which agribusiness expansion was given and continues to give, expelling population without generating employment the territory is being reconfigured, already without the traditional actors of some demographic and socio cultural weight; the State is no longer a producer of territory and the configuration, production and articulation of spaces becomes controlled by dominant actors with veiled interests that happen to determine the relations with those remaining.

**Table 2. Variation in the number of farms and the occupied area inter-census period**

Farm size (hectares)	Amount of farms		Total area (hectares)	
	1991	2008	1991	2008
<b>0-200</b>	298,953	276,160	3,697,169	3,118,893
<b>200-500</b>	3,503	5,251	1,050,034	1,600,537
<b>500-1,000</b>	1,525	2,737	1,010,952	1,810,119
<b>1000-5,000</b>	2,356	3,443	4,982,438	7,200,531
<b>5,000-10,000</b>	533	684	3,644,873	4,702,034
<b>&gt;10,000</b>	351	600	9,730,949	12,654,779
<b>Total</b>	307,221	288,875	24,116,415	31,086,893

Source: Agro-livestock Ministry. Agro-livestock Census, 2009.

In the process of concentration increases the cultivated area of soybean and the number of producers decreases; the Brazilian victims of the concentration of land annexed by larger farms that end up delivering their land to suppliers return to Brazil (Avalos et al. 2017, Lima S. 2017).

Among owners with properties ranging from more than 31,000 hectares to more than half a million hectares the largest area corresponds to foreign capital including the Moon sect (590,000 hectares), Espiritu Santo Group (136,559 hectares), Favero Group (129.817 hectares). The group also includes the most influential owners of media and President Cartes' companies, which provides evidence of the connection between monopoly of land and political power in Paraguay<sup>4</sup>. It is important to note that the owners of the land are linked with the commercial capital and financial capital, in addition to its activities as livestock farmers or soybean agribusiness and in some cases as rentiers.

One of the aspects of the process of concentration of land, accented with the soybean production, is its land-grabbing by Brazilian producers, i.e. the denationalization of land is given basically through individuals more than large corporations or foreign States, such as occurs in Africa (Borras et al. 2012). This hoarding of land by Brazilians was already of such magnitude in 2008 than in the Department of Alto Paraná 62.5% of the more than 1,000 hectares farms are from foreigners, and

<sup>4</sup> Oxfam 2017. Yvy jara. Los dueños de la tierra en el Paraguay.

among these 55% are Brazilians; in Canindeyu, another border Department, the proportion of Brazilians among the owners of more than a 1,000 hectares reaching 60%.

The beginning of this process was already on the 70's from last century; since then Paraguayan economic possibilities become dependent on Brazilian developmental projects. This dependency is accentuated as Brazil turns out as an emerging power and a global player (Abente 2017, Masi et al. 2017), and encourages the formation of multinational corporations with financial support.

In recent years land grabbing in question has significantly deepened and Brazilians dominate among agribusiness entrepreneurs of neighboring countries, which defines a peculiarity of the social structure that has Brazilians as one of the key actors with a biased view that frequently disqualifies and discriminates Paraguayan peasants. This fact has several consequences.

### **3 Separation of peasants from the means of production without proletarianization**

It is pertinent to point out that in the case of Paraguayan social formation the development of agrarian capitalism separates the direct producer from the land but does not generate a process of proletarianization; comparing data from the 1991 and 2008 censuses shows a substantial decrease in temporary paid labor reaching 74.8%, while permanent paid labor remained unchanged. It can be stated that Lenin's thesis is not fulfilled, which affirms that the development of agrarian capitalism results in a social structure with antagonistic classes that are defined by positions shared in the relations of production.

Large companies, which certainly are not constituted of rich farmers, with their advanced technology displace peasants without creating jobs, and temporary proletarianization is basically generated by own peasant units that hire labor to complete their needs and only in few cases become rich farmers and later, entrepreneurs. Under these conditions there is no formation of a salaried peasant class that is based on the division of labor and with the same material interests, although the resulting collective shares a common consciousness that has more to do with its condition of being stripped; those already uprooted become dependent on multiple strategies including precarious work in urban belts and receiving remittances.

The so-called process of uprooting and pulverizing of plots increases the differentiation of peasant productive units and weakens the peasant actor; hence the divisions between organizations noted by some authors (Piñeiro 2004) are due less to intrigues between leaders than to heterogeneity of material interests, as well as regional differences. Also the class struggle, which in Paraguayan case with an agro-exporting economy is rural and it is linked to the land, is weakening; class conflict is limited to local spaces.

### **4 New players of agro business**

The new players that reconfigure the social structure include globalized actors such as the large corporations of the neoliberal agro-alimentary regime, agribusiness entrepreneurs and rentiers. Considering the forms of land tenure (Table 3), attention is drawn to the frequency of farms held as rented and, at the same time, that of rentiers tenant; in this sense it is pertinent to note that the farms under 20 hectares that are listed as soybeans producers in the 2008 Agro livestock Census and which represents 66% of the total holdings that in such source are listed as soybean producers, are actually plots of small rentiers; soybean as a crop of scale is not viable in small plots. In the new context, peasants who access plots of land that are desired by the agribusiness with the lease of their land, earn income that they could hardly achieve with their own production.

Of the 22,456 landowners who receive rents for the lease of their land, 17,691 are small producers who own plots of less than 20 hectares that lease small areas; at the other end 586 owners are rentiers with parcels larger than 1,000 hectares leased basically to soybean producers, and who receive at least half a million dollars a year for renting their land (Table 3).

**Table 3. Forms of tenure according to size of the holding. 2008**

Farm size (hectares)	Amount of farms	Amount of owners	% of owners	Rented farms	Holdings as occupants
0-200	276,160	126,360	45.76	20,518	77,084
200-500	5,251	3,169	60.35	951	282
500-1,000	2,737	1,708	62.40	421	244
1,000-5,000	3,443	2,558	74.30	448	226
5,000-10,000	684	580	84.80	68	29
>10,000	600	537	89.50	50	13
Total	288,875	134,912		22,456	77,878

Source: Agro-livestock Ministry. Agro-livestock Census, 2009.

At least a part of these hold lands that are public goods, which are emblematic cases of accumulation by dispossession. It is notable that 268 large producers with farms greater than 1,000 hectares were registered in the 2008 Census as mere occupants; it can be assumed that these are fiscal lands, and that those who possess them are usurping public property.

The most important agribusiness actors came to the country with the neoliberal food regime, among them the representatives of large transnational corporations that exploit biotechnology, which are the most important economic protagonists in the neoliberal food regime. The following Table 4 shows the main transnational corporations operating in the country, and as a dominant player on a global scale, they control the development, production, processing, export and / or distribution of biotech products, especially soybeans, soybean oil and for its clients, medium and large agribusiness entrepreneurs to which it subordinates. Beef is also an important product in this distribution.

Globally, some of these corporations control the production of supplies while others monopolize the export of agribusiness products; even those in a third group also control processing. Only five corporations Syngenta, Dow, Basf, DuPont and Bayer-Monsanto control 75% of the market; after the merger of Bayer with Monsanto, which began in 2016, the resulting transnational will control 25% of the world pesticide market and 30% of the seed market. The economic power of these large corporations and media support, coupled with their dishonest practices, explain to an important extent the adherence to their ideas by local professionals who exalt the benefits of the system.

Out of the 18 largest agribusiness firms engaged in import and export, 5 of them process and export beef, including those of Brazilian capital that control most of the processing and exporting, although some of them also involved in the production itself or in any case acquire cattle from Brazilian producers; one of them, JBS the largest meat company in the world began in 2016 with an export of 226 million dollars<sup>5</sup>. JBS, with capacity to slaughter 1,200 heads per day, illustrates the corrupt

<sup>5</sup>The corporation also purchased the San Antonio and IPFSA refrigerators.

practices of large corporations to be involved in bribery at the Brazilian President himself and the notorious scandal rocking the Brazilian political world<sup>6</sup>.

It is noteworthy that in the case of beef the participation of Brazilian companies occurs in all phases of the chain, covering production, processing, export and distribution. In the case of JBS, it is one of the largest meat companies in the world that had multi-million dollar subsidies from the Brazilian government through the National Bank for Economic and Social Development (BNDES).

The continued expansion of the Brazilian economy in Paraguay is basically given through land grabbing, progressive control of soybean and livestock agribusiness production, processing and export of beef, and maquila. Soybean is an expression of Brazil's geopolitical power and one of the pillars of its insertion in a multipolar world, contributes to the balance of payments to China and facilitates land control by Brazilian businessmen in countries of the region and even in Africa (Oliveira 2016).

This expansion of the Brazilian economy is actively promoted by the Brazilian State through subsidies, diplomacy, and legislative measures, although in the case of soybean business owners are fully subordinated to large corporations, basically of American capital that control production technologies and globalized markets. Subsidies that financed the expansion of Brazilian monopolies in Paraguay were given through the BNDES.

**Table 4. Major corporations of agribusiness and its operations. 2016**

Corporations	Exports (fob millones de US\$m)	Imports (US\$m)
Cargil	653	6
ADM	584	3
Agrotec S.A.	8.3	60
Frigorífico Concepción	386	2.6
Mercantil Comercial S.A.	298	---
Bunge Paraguay S.A	234	26
Frigomer	223	---
Frigorífico San Pedro	229	---
Compañía Paraguaya de Granos	174	---
JBS Paraguay S.A.	226	23
Sodrugestivo Paraguay S.A.	217	9.4
Noble Paraguay	176*	54*
Bayer	---	53
Monsanto (Paraguay)	---	36
Agrosilo Santa Catalina	68	---
Dow agroSciences Paraguay	---	21
Frigorífico Norte S.A.	44	---
Syngenta Paraguay	---	52

Source: Own elaboration based on customs data (2017)

<sup>6</sup>The meat giant would have bribed more than a thousand Brazilian politicians to cover up their illegal practices and led to the resignation of four President Temer's ministers. See Ultima Hora from the 19th. to 21st. /05/2017.

\*Data from 2014

## **5 The State support to agribusiness**

The commitment from the State to the neo-extractivism promoted by the large biotechnological corporations is openly and systematically expressed and manifested in various ways; the intensity of agribusiness support increases with the direct control of the State by representatives of the factual powers. Policies in both actions and omissions point to excluding territorial projects that aim to remove peasants and indigenous people from arable soils, to the point where it is promoted the intervention of thugs or private guards in the evictions, sometimes acting jointly with the National Police. In fact, judges and prosecutors have as one of their functions to give warning of legality to a process of accumulation by frequently dispossession of public resources confirming the validity of the affirmation of Thrasymachus of Chalcedon who defined in ancient times justice as what is convenient for the strongest<sup>7</sup>.

While Parliament understands that it must not charge tax to agribusiness and dictates laws that facilitate its expansion the Government is reducing the budget of the Ministry of Agriculture and Livestock to such an extent that in relation to assigned dropped by almost half in 2014, and resources apply to increasingly larger farms<sup>8</sup>. At the same time the Paraguayan Institute for Agricultural Technology (IPTA) devotes its resources increasingly to research and experimentation in GM in partnership with large corporations; paradoxically that is the bet to achieve national development.

## **6 The development of the productive forces and the emerging scenarios**

The expansion of agribusiness in question, faced by capital intensive enterprises that produce in scale monoculture regime implies an intense deterioration of the natural resources that constitute the basic capital of the country. Even though the cultivated area by GM crops, led by soybeans, increased significantly in the amount of poisons used was much higher; That is to say, more and more agro-toxic and with more toxicity per cultivated area with transgenic is used, such as the herbicides due to resistant weeds that now reach 12, and that require the use of desiccants of more harmful incidence to Human and environmental health.

One of the herbicides in question is 2-4 D known as Orange Agent used as a chemical weapon in the Viet Nam war. Only between 2014 and 2015 the import of 2-4 D increased by 9.4% while the Paraquat increased by 62.4% (Base-IS 2015). The progressive increase of poisons is of such magnitude that only in the first months of the year 2015 they entered the country 31 million kilograms and 20 million liters, which were applied to the soil, contaminating the environment; to measure the magnitude of the problem you should take into consideration the fact that Paraguay is the country with a larger portion of acreage with genetically modified crops and it can be assumed that the load of 9 kg of biocide products per capita is the highest at least in the region (Base-IS 2015).

In relation to the increase in resistant weeds in Paraguay, in a non-ending process, Monsanto has patents of herbicide resistant to these plants (Fogel 2015). The increased use of herbicides and increasingly with greater toxicity is part of the development of the productive forces of the agro business which not only alters the relations of production, by separating the peasants of their means of production without turning them into proletarian but it also shows the limits of GM technology, causing severe damage to human and environmental health. Damages in health caused by Monsanto herbicides are so obvious that the Environmental Protection Agency (EPA) from the USA it is

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<sup>7</sup>As Monserrat Álvarez reminds us in Thrasymachus in Guahory, ABC 14/05/2017. Chalcedonia is an ancient city of Bithynia, built in 685 BC.

<sup>8</sup>Considering the four hundred largest taxpayers, agro-export companies taxed US \$ 13.9 million in 2016. Ultima Hora 04/06/2017.

probable to review its earlier conclusion that it is unlikely that glyphosate causes cancer; in fact 8 out of 15 experts expressed their concern about the previous benign gaze of the EPA and 3 experts called the data used as biased and unreliable; already in 2015 the International Agency for Research on Cancer tagged glyphosate as likely to be carcinogenic, and in July 2017 California State included glyphosate in the list of known carcinogenic (Bellinger et al. 2016). It is important to consider that the negative impact on human health of the herbicide it is not just limited to cancer.

The increasing use of chemical fertilizers also shows diminishing returns which require progressively larger applications so the raise in the volume imported increased by 31% between 2014 and 2015<sup>9</sup>. Taking into account the impacts on human health already in the 90s of last century investigations of research centers of excellence in the northern hemisphere had demonstrated the highly adverse impact on human health of the 2-4 D herbicide used in the Viet Nam war, particularly its carcinogenic effect, damage in the nervous system, and deformations of the descendants of the population exposed to their use (Fogel 2001), in recent years new research focused on increasing neurological damage caused by agrochemicals and particularly the effects of glyphosate on prenatal health.

Thus, Seneff et al. (2015) presented evidence of synergistic incidence of glyphosate and the aluminum in the pineal gland pathologies, related to intestinal disorders and neurological diseases. Various neurological disorders including autism, depression, dementia, Parkinson's disease, anxiety disorders are associated with abnormal patterns of sleep directly related to the pineal gland dysfunction; at the same time this gland is highly susceptible to two substances with great presence in the industrialized nations which are aluminum and glyphosate; the latter is an active ingredient in the herbicide Round Up.

The authors demonstrate that concerned toxic substances affect synergistically in the production of neurological damage; glyphosate interferes in the intestinal function affecting the metabolism of substances necessary for the brain. Its toxic product p-resole is linked to autism in humans and in rats used in trials; this substance increases the absorption of aluminum; also listed evidence of synergistic interaction between this chemical element and glyphosate which leads to imbalances in the pineal gland functions. Glyphosate aluminum chelate allows the ingestion of Al exceeding the intestinal barrier, inducing anemia which leads to hypoxia, fostering neurotoxicity.

The study presents strong evidence that relates to the remarkable increase of autism in the United States, as well as other neurological ailments mentioned with chemicals in the environment; the application of glyphosate data were obtained from the United States Department of Agriculture, which allows to determine the relationship between the amount of surface of certain spaces exposed to glyphosate use and the incidence of neurological diseases referred. The correlation is demonstrated in statistical and theoretical terms of Biomedical Sciences.

At the same time Bellinger et al. (2016) discusses the toxic effects of exposure to neuron in early life including the prenatal stage, incorporating the context of child development in research on neuron degeneration. Ailments caused by exposure to neuron toxic in early life make it difficult for cognitive development and are at the beginning of a process of event's cascades that can cause additional diseases that differ from those observed initially.

The aforementioned intra-family and intergenerational exposure have impacts and influences the child's ability to respond to future negative actions. It is an environmental factor that alters biological processes and affects subsequent development; neurological damage suffered in early childhood is on a cliff which includes anxiety, anemia, dementia, schizophrenia, and manifestations of crisis behavior. The authors are based on solid evidence showing that deficits associated with exposure to neurotoxic tend to be immutable; they affect the development of brain microstructure. The cumulative risks associated with mixtures are being evaluated by focusing the analysis on similarly chemicals

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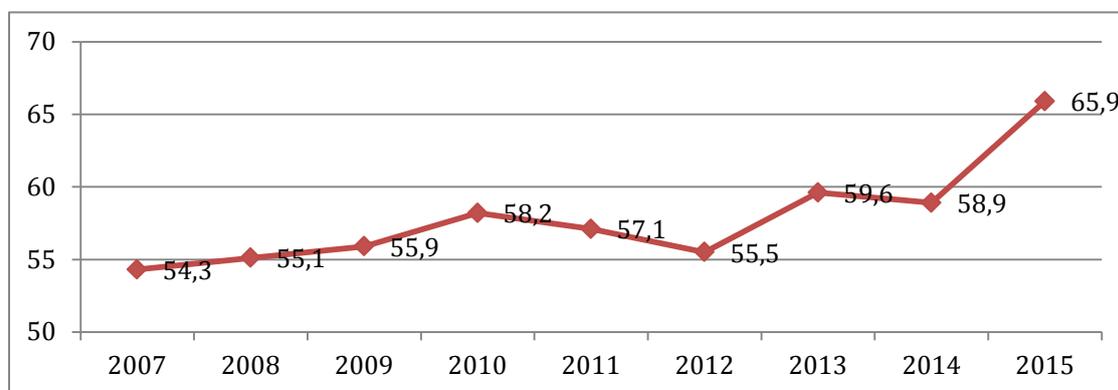
<sup>9</sup> See SENAVE Anuario Estadístico 2014 and Anuario Estadístico 2015.

structured or common action. Since 1996, the cumulative effects of multiple chemicals that have mechanisms of common toxicity are considered.

Neuropsychology's deficits include poor processing of verbal or visual information, inability to maintain attention, disorganization of strategies for solving problems, difficulties in the processes of communication and even antisocial behavior; these problems involve damages to the nervous system that are not openly expressed. The chemical attacks on the brain cause a variety of diseases; a case studied is the relationship between prenatal exposure to plumb and schizophrenia, and it is poor children who suffer more deficits associated with plumb neurotoxicity, which are permanent, since they are more exposed to poison sources and their homes are more precarious (Padilla et al., 2014). Also in a recent study, contamination with toxic substances from dairy-fed soybean, maize and other grains was investigated in Denmark and it was determined that all of them excreted glyphosate in their urine and demonstrated the effect of this active principle on the cells of the muscle and in the liver of these animals; of the impact of the agrochemical in question on the blood parameters is inferred its genotoxic and teratogenic activity. (Krüger et al, 2013)<sup>10</sup>. A working paper presents more evidence on the consequences of productive forces expansion in agro business<sup>11</sup>.

In Paraguay morbidity and mortality related to environmental contamination is high and it can be assumed that it is climbing; congenital malformations as a cause of infant mortality reached 27.4% in 2014 is the second largest and it is climbing from year to year (Figure 3).<sup>12</sup>. At the same time considering the mortality indicators by broad groups of cancerous tumors constitute the second leading cause has increased from 54.7/100,000 in 2007 to 65.9/100,000 in 2015 (Figure 3)<sup>13</sup>. On the other hand the Ministry of Public Health in the resolution approving the national health policy concerns that malignant neoplasm is the second leading cause of death<sup>14</sup>.

**Figure 3 Tumors. Mortality rate per 100,000 population.**



Source: Ministry of Public Health and Social Welfare

Even though the conceptual framework refers to the social determinants of health and the development actions that address those determinants strengthening surveillance of occupational and environmental factors that may affect health (Base-IS 2016) and despite overwhelming evidence of the severe

<sup>10</sup>There is also evidence demonstrating other consequences of pesticides. Thus, it is mentioned the endocrine disrupting effects that affect the capacity that produce alterations in the homeostasis and the reproductive endocrine system what can produce dysfunctions of the reproductive apparatus. See Base-IS, 2016.

<sup>11</sup>See Fogel, R. Las Fuerzas productivas en el capitalismo agrario actual en el Paraguay. Working paper. [www.ceri.org.py](http://www.ceri.org.py)

<sup>12</sup>.See Subsistema de Información de Estadísticas Vitales (SSIEV). Dirección de Estadísticas en Salud (DES). Dirección de Información Estratégica en Salud (DIGIES)- MSPyBS. 2015.

<sup>13</sup>See Basic Health Indicators. MSP y BS. 2016.

<sup>14</sup>Resolution SG No. 612/2015 Approving the national health policy 2015 - 2030 Con la Soja al Cuello, Marielle Palau. Base-IS. 2016

damage to health caused by pesticides that reach the population through contaminated food, the Ministry of Health promotes paradoxically soybean consumption in needy families<sup>15</sup>. Thus, the Director of the Institute of Social Welfare from the Ministry of Public Health recently reported that due to the success of the program "Capeco's Nutrition with soybean" government has interest in replicating this experience on 72 family centers of the Ministry of Public Health<sup>16</sup>. Certainly, the less perceptible but more serious effects of neo-extractivism are the irreversible damage to human and environmental health; these damages occur not only at the national level, while reprimarized neighboring countries follow the same route, and even the recharge areas of the enormous Guaraní Aquifer which is shared with neighboring countries received the mentioned contaminants; otherwise the toxic effects reach more remote populations through the food chain. This circumstance and the scope of global players from corporations involved raises the need to feed the discussion in the arenas in which normative aspects of the international order are accord.

## 7 Conclusion

Several are the derivations of the agribusiness expansion and particularly of the development of its productive forces that imposes limits to its own reproduction, as they are exhausting the fertility of the soils and generate resistant weeds and the chemical contamination of its own production will begin to generate rejection of the most demanding markets, that consider food and consumer's right more as public good than as something comparable to a commodity.

Environmental contamination, more intense than in other countries, manifests itself in many diseases, including the neurological, associated with the increased use of glyphosate; derivations of these damages that develop in cascade raises the need to pay attention to the relationship between increased anti-social behavior and the neuron degeneration; in these conditions the recruitment of fanatizable extremists is facilitated.

With the uncontrolled use of biocides not only does the West self-destructed, accentuating its decline. This issue affects not only Paraguay; as it can be seen the global scope of damages in the context illustrated by Brazil soybean GM producer, China that imports it and soybean industry and technology controlled by corporations based in the United States. In fact, some of the corporations that control GM technologies are related to a criminal economy that requires a transnational approach (Bellinger et al., 2016).

Thus, environmental contamination becomes an important axis in the contradictions that affect the system as a whole since if not altered it can become a kind of extermination war that will have among its victims the own population of the hegemonic center.

This circumstance raises the peremptory need for public health policies that address environmental contamination; these policies referring to child protection should pay attention to deficits associated with early exposure to neuron-toxics that cause immutable pathologies. In these cases the available alternative is to address environmental factors that are causing irreversible damage; prevention of exposure to pesticides is a goal that should not be put in discussion.

Taking into account the expansion of agribusiness will continue feeding the hunger for land at the global level and that the basic function of the Paraguayan State is the protection of the interests of its citizen's public policy should seriously consider nationalization of this resource.

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<sup>15</sup>In this sense in a US study in 3 of 10 women tested for the presence of high levels of glyphosate in breast milk was detected, also recent studies established the average presence of poison 10 times higher than Europe in countries where Transgenic Soybean is not cultivated (Fogel, 2015).

<sup>16</sup>See ABC Color, "Programa de nutrición con soja beneficia a pobladores de Zeballos" May 16th. 2017

The Paraguayan neo-extractivism basic component of the development associated with Brazil shows its own limits and raises the need to discuss a post extractivism that distances the scenarios of the route of death in which we are currently induced (Abente 2017, Masi et al. 2017). These alternatives could be found in countries that are part of the BRICS block that could provide good replication practices. The growing interdependence among countries that puts us all in the same boat requires States and blocs with a global advocacy capacity to conceive new ideas that renew areas of cooperation that promote an agenda that prioritizes health and environmental care. Certainly Brazil and other emerging powers of the BRICS bloc are in a privileged position to include this issue in the reform of the regulatory system of world trade; also at the regional level the integrationist vision of the possible future should emphasize this socio-environmental agenda.

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