The Internationalization of the Mexican Agro-Food Sector

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Introduction

The internationalization of agricultural production and related processing industries has increased rapidly in Latin America and in the Third World since the 1960's. The initial push to the acceleration of this process came from the growth and the promise of the Green Revolution in the 1940's and 1950's: with new technology, improved seeds, fertilizers, pesticides and other new inputs agricultural production was beginning to look like a profitable enterprise also in developing countries, at least in some of them. But if engaging into direct production was still considered too risky or was subjected to restrictions for foreign capital, catering these new inputs to local producers was safer and even more profitable. The process has yet been enhanced by the overall modernization of the Third World societies: the changing patterns of local consumption towards those of the industrialized nations have given rise to the markets of more processed food products, in turn offering new potential for foreign investment and global sales promotion. Thus, one can perceive three levels, or fronts, in which the process of internationalization has taken place: the agricultural input industries, direct production itself , and the processing industries. The latest phase of the process has been that of regrouping capital in all these fronts under centralized transnational, corporate capital.

One of the principal factors behind this development pattern has been the pre-eminence of the United States in food grain exports, also greatly envigorated by the Green Revolution impetus in the first place. According to Miguel Teubal, in 1982 the United States was producing 45 percent of the global wheat sales and 55 percent of other grains, including 90 percent of soybean and 22 percent of rice; and, as the Western European countries had by then reached self-sufficiency in basic food production, there was a large, constant overproduction in the U.S. agriculture, which now increasingly turned into finding new markets in Third

World countries.[1] Using heavy subsidies or dumping and its dominant position in global markets the United States was able to ”pursue international agricultural trade policies which simultaneously served cold war geopolitical goals and opened up new markets for the disposal of domestic production surpluses”.[2] This undermined food security in many Third World countries on their way becoming newly industrialized countries.

The U.S. dominated post-war food regime affected the internationalization of global agriculture in various ways. First, the more or less ensured global markets for the U.S. producers encouraged the continuing expansion of agricultural input industries (machineries, agrochemicals, etc.), and for these too, new markets were seeked abroad. Second, the saturation of domestic demand for basic food in the industrial North turned food-processing industries to develop and ingenuously invent new processed products which could use the surplus basic food crops but which would not necessarily taste like them: as one can see at any supermarket, there is, by now, an indefinite spectre of these products, ranging from all kinds of flakes, crunchies, crispies and chips to pastas and ready-mix-powders for pancakes, vanilla sauces or for cajun gumbos, for that matter. Then, exporting this dietary pattern to developing countries enhanced the exports of Northern surplus basic food crops to these countries, as a growing proportion of local basic food production was transformed into raw material for food processing industries.

Third, the ”fast-food revolution” in the North demanded ever-growing quantities of meat, mainly beef, which, in turn, had triple or quadruple effects. Meat production in developing countries was encouraged, at first to cater the fast-food industry in the North and later, when local consumption patterns were changing, also that in the developing countries themselves - especially true in Mexico and Central America, close enough to the United States. More and more agricultural land in developing countries was thus dedicated to meat production, which gave new outlets for the exports of animal feed grains from the North (including specificly animal feed grains, like sorghum, and surplus human basic food, like maize, and also industrialized, packaged and balanced animal feeds, say for the poultry industry) while yet diminished the share of agricultural land dedicated to basic food crops in those developing countries. And of course, as the fast-food consumption pattern spread globally, fast-food chains of the North found also room for expansion in the South through franchising.

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[1] Teubal, Miguel, Internationalization of Capital and Agroindustrial Complexes: Their Impact on Latin American Agriculture, *Latin American Perspectives*, vol. 14: 3, 1987, pp. 316-364 (esp. P. 321-327).
[2] Goodman, David & Watts, Michael, Reconfiguring the Rural or Fording the Divide?: Capitalist Restructuring and the Global Agro-Food System, *The Journal of Peasant Studies*, vol. 22: 1, 1994, pp. 1-49 (pp. 18-19).

On another level, the internationalization process has been a process of capitalization of agricultural production, which, in effect, has meant a strive ”to create sectors of valorisation by re-structuring the inherited, ‘pre-industrial’ rural labour process”.[3] There has been a tendency of capital to eliminate the agricultural labour process as a land-based activity, signifying a constant attempt to diminish the value of land in the production process. All new technological innovations have been of land-saving type, whether seeds, fertilizers, green-house technology or whatever; land itself as a production factor has lost its relative importance. However, this strive has been impossible to get completed totally, as agricultural production in most products is still intimately linked to natural processes through land. Therefore, the capitalization of direct production has meant valorisation through partial appropriations.[4] As a result, land-based direct production has not in all cases been the top priority field of activities for international capital in creating agro-industrial complexes. This has left some room for manoeuvre for family-based production units, whether peasant or capitalist farmer type of the North.

There has been some discussion on the extent to which the latter type, capitalized family farming, has taken root in Latin America[5] but what is more significant is that a considerable peasant sector has been able to survive under the new, internationalized agro-food regime until today. However, the most recent neo-liberal deregulations of state’s agrarian policies in Latin America (and especially in Mexico) will undoubtedly enhance the articulation between agro-industrial complexes and peasants, implicating renewed subsumption of the latter by the former, accelerated competition between the two and in some cases, hopefully, cooperation as well. The future of the peasantry - whether it will face a total demise or whether some peasant production enclaves will survive - is beyond the scope of this paper, but one should keep in mind that the process of internationalization, having been in progress already for decades, has gained new impetus from the recent neoliberal deregulation and continues greatly envigorated, which may result in more drastic, more painful and less easily accommodated changes for peasants - especially so in Mexico with such a extensive record of intensive agrarian policies and state intervention in agriculture.

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[3] Goodman, David & Redclift, Michael, Capitalism, Petty Commodity Production and the Farm Enterprise, *Sociologia Ruralis*, vol. XXV: ¾, 1985, pp. 231-247 (pp. 240-241).
[4] Ibid.
[5] See Llambi, Luis, Transitions To and Within Capitalism: Agrarian transitions in Latin America, *Sociologia Ruralis*, vol. XXX: 2, 1990, pp.174-196 (pp. 183-184).

Foreign Capital and the Agro-Food Sector in Mexico

After the second World War Mexico's agricultural output grew tremendously, and, at first, rapid growth was experienced both in commercial and in peasant production. The state provided new productive inputs - credit for irrigation and mechanization, subsidized energy and transportation, and the like - and, as a "basket-case" of the Green Revolution, Mexico not only maintained self-sufficiency in basic food crops despite of the rapid population growth but generated new and flourishing agricultural exports, mainly to the U.S. markets. In the long run, however, the relative deprivation of the small scale peasant sector grew wider in respect to the commercial sector, as the incentives the state provided went disproportionately to the latter and as surplus was transferred from the former to the latter by structural factors (e.g., low labour costs were made possible by the semiproletarianized status of the peasant labor force). But the widening gap between the commercial and peasant sectors did not hinder the "take-off" of the former; on the contrary, it has been maintained that the existence of a large, small scale peasantry based on subsistence production was a precondition for the agrarian capitalism to develop in the first place.[6]

Thus, the Mexican agrarian sector offered a wide range of sufficiently commercialized and infrastructurally developed branches of agricultural production from relatively early on for foreign capital to build on. And of course, for the U.S. agribusiness the proximity of Mexico was an important asset as well. Even when the (relative) stagnation of the Green Revolution became more apparent in the late 1960's, the internationalization process continued unabated. Significantly enough, the politically more turbulent period of the late 1960's and the subsequent *sexenio* of Luis Echeverría with its leftist undertones and envigorated agrarian populism did not affect the process either, as the basic rules of the game were left intact, no matter the revolutionary rhetorics of the government. Consequently, foreign direct investments into the Mexican agro-industrial sector grew from 173.8 million U.S. dollars in 1960 to 917.3 million dollars in 1979, of which the share of food products rose from 43.4 million dollars to 531.2 million dollars, respectively.[7]

This internationalization was linked to the industrialization of the agro-food sector. During the 1960's the proportion of agricultural production directed for further processing grew from 25 percent to almost 44 percent of total in 1970, or,

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[6] Bartra, Roger, *Estructura agraria y clases sociales en México*, México: Ediciones Era 1974, p. 51.
[7] Astorga Lira, Enrique, *Mercado de trabajo rural en México: La mercancía humana*, México: Ediciones Era 1985, p. 67.

to put it otherwise, in the period 1960-1975 the Mexican food processing industry grew on the average 8.4 percent annually.[8] Most of the foreign capital invested in the Mexican agriculture went to the processing industry and not to the basic production, which is understandable from the profit-making point of view: the more processed the more added value a product brings. This means also that the growth has been most rapid in ”luxury products” that are more processed, relatively more expensive but nutritionally poorer (e.g., products like potato chips and other snacks, bisquits, pasta, mayonnaise, soft drinks, etc.). As Teubal notes, the new Mexican food industry has been oriented to follow the consumption patterns of the advanced capitalist countries and towards the higher income strata of the Mexican people.[9]

The reverse side of this development was that in the early 1970's Mexico became a net importer of basic food crops, as production shifted more and more from these crops to other, commercialized (directed for further processing) or exportable crops, and as a growing part of the basic crops themselves (especially of wheat, but also of maize) was directed for the food processing industry.[10] This turn reflected also the more general trend in the global food regime: at that time the U.S. grain exports were shifting their focus from Europe to the Third World, and, against the declining world market prices of basic grains (due to the heavy subsidies paid in the United States), large scale commercial production of basic food crops began to look all the more unprofitable in Mexico. Basic food production were lagging behind so badly that imports were needed even though the consumption of these crops (mainly maize and beans) declined on per capita basis. In the 1980's, when decreasing real incomes reduced the buying capacity of the majority of the population, there was not only a crisis of food production but a severe one of nutrition as well.[11] Had there not been the small-scale peasant production of basic food, the situation would have been even more dramatic.

However, direct production has by no means been left untouched by the advance of agrarian capitalism. The growing tendency of vertical integration has directed the interest of agroindustry both ”upstream”, that is, to direct production, and ”downstream”, to distribution and marketing even at retail level in shops and restaurants. Even if agroindustrial enterprises do not undertake the actual task of

[8] Teubal, art. cit., p. 340.
[9] Ibid., p. 342.
[10] The road of Mexico from a basic food crop exporter to an importer has been analyzed by several authors, see, for instance, Barkin, David & Suárez, Blanca, *El fin de la autosuficiencia alimentaria*, México: Nueva Imagen 1982.
[11] Romero Polanco, Emilio, La crisis y la alimentación nacional: opciones de desarrollo, *Comercio Exterior*, vol. 40: 9, septiembre de 1990, pp. 859-867.

direct production they do, in many cases, control and influence the production process by contract farming or by means of their position as a monopoly buyer of the product. An extreme example of such monopoly position is tobacco: in the 1980's, two companies, affiliates of two major transnational tobacco companies (BAT and Philip Morris), controlled 99 percent of tobacco sales in Mexico.[12] Until recently, direct ownership of agricultural land in Mexico was restricted to Mexican nationals only, making the use of contract farming or a minority share in a Mexican farming company the options available for foreign capital, but since the December 1991 reform to the Article 27 in the Constitution and the deregulation of property rights restrictions brought by NAFTA, also direct production is now open for transnational companies, if only deemed profitable enough.

In addition, the growing tendency of horisontal integration - meaning that TNCs and large national conglomerates expand their operations into several sectors and lines of production - has extended the influence of a single company, usually through affiliates with distinct names, simultaneously over a great variety of related and unrelated products. Expanding operations both within a sector and across sectors is, of course, open to both domestic and foreign capital, and the former may have some competitive edge by knowing the markets and suppliers and sharing the business culture, but the general lack of capital in the Mexican agrarian sector facilitates the expansion of the latter. The lower overall costs of production on the Mexican side have also a notable pull effect to bring in new foreign capital. Under the present free trade regime, one may suspect that taking up direct production in Mexico can be lucrative for those U.S. companies that already have some processing industry based on agricultural products on either side of the border: by combining direct production and processing they may seek to strengthen their market position in the whole NAFTA area. For sure, international agribusiness may bring capital to the Mexican agrarian sector, but to the extent it will only replace domestic Mexican capital from the sector, it is a zero sum game, and, to the extent it would domesticate the revenues abroad, it could result in a negative balance for Mexico.

Although lacking recent figures, it is safe to say that the Mexican agrarian sector has been heavily penetrated by foreign capital. Already in the early 1980's, 130 foreign companies, with over 300 individual plants, controlled many key agro-food sectors in Mexico: e.g., instant coffee, soft drinks and juices, snacks, milk products, chicle, animal feed grains, canned food, bottled salsas, wheat flour based mill products, processed fruits and vegetables, baby food, tobacco, meat

[12] Teubal, art. cit., p. 347.

products, to give a selection. Of these companies 33 belonged to giants that were among the 100 largest agroindustrial conglomerates in the world.[13] There is no reason to expect that the presence of foreign capital in the Mexican agriculture has diminished from those figures, given that former limitations for investment, profit domestication and monetary transactions in general have been lifted in the 1990's.[14]

Direct production has been internationalized also from another direction: a significant proportion of the productive inputs is being controlled by foreign capital, especially those of seeds, agrochemicals and machinery. With the exception of a few basic crops (maize, beans, rice, and to a lesser degree, wheat) most of the seeds used for commercial annual crops are hybridized varieties either imported or produced in Mexico by the affiliates of TNCs: for example, almost a hundred percent of the two most important animal feed grain seeds (sorghum, alfalfa) and a major part of cotton, vegetables and spices like cardamon and a half of wheat seeds are provided by international agribusiness. And as commercialized seeds are hybrid, they need a higher input of agrochemicals (pesticides, insecticides, fertilizers, etc.), of which a considerable share is again provided by foreign companies or their Mexican affiliates. Of machinery and equipment the foreign control is less marked and varies from sector to sector but is still notable, say, from tractors to chicken incubators and milking machines.[15]

In the 1990's, two of the most expansionist product categories in the Mexican agro-food sector have been those of fruits and vegetables, especially those grown for the U.S. winter season. For instance, the exports of vegetables and fresh garden products (like strawberries), excluding tomato, grew from 489 million dollars in 1991 to 929 million dollars in 1995, and tomato exports from 395 million dollars in 1993 to 586 million dollars in 1995.[16] It is in these products that foreign capital has also been active. In the early 1990's, of the estimated 100 000

[13] Astorga Lira, op. cit., pp. 66-67; Teubal, Miguel, art. cit., pp. 340-341.

[14] An interesting change has taken place in the foreign direct investment (FDI) participation in Mexican companies. In 1985, of all Mexican companies with any amount of FDI 31 percent were companies in which the share of FDI was between 41 and 50 percent of the constant capital, and in 40 percent of the companies with FDI the share of FDI was 91-100 percent; in 1994, however, only in 14 percent of companies with FDI the share of the latter of the constant capital was 41-50 percent, while in 60 percent of companies with FDI the share of FDI was 91-100 percent (see table 14 in Cervantes González, Jesús A., Cambio estructural en el sector externo de la economía mexicana, *Comercio Exterior*, vol. 46: 3, marzo de 1996, 175-192). Thus, there seems to be a tendency from minority shares to majority shares in the participation of foreign capital in Mexican companies. There is no reason to believe that similar trend would not apply to agroindustrial companies as well, although we are lacking evidence of this.

[15] Astorga Lira, op. cit., pp. 64-65.

[16] Cervantes González, art. cit., p. 192, appendix 3.

producers of fruits and vegetables 22 000 were producing for export and among those a group of 50 companies, mainly foreign with a few national ones, were controlling a major share of the exports.[17] It is evident that the internationalization in the fruit and vegetable sector has contributed to the separation and logistical differentiation of domestic and export branches of the sector and to the division of the export branch itself into a great many small and a few really big ”players”. Then, as the producers, big and small, are very dependent on the foreign-controlled productive inputs in seeds, crop varieties, technology and marketing, the idea of a purely Mexican producer in this sector is somewhat deceptive, as noted by Sanderson.[18]

Sorghum and Dairy Products: Cases of Foreign Control

The history of sorghum in Mexico is a prime example of the surge of a previously unknown, imported crop variety, highly internationalized from the beginning.[19] Test cultivations of sorghum started in 1944 as a joint effort of the Rockefeller Foundation and the Mexican Ministry of Agriculture, with the objective to introduce an alternative crop for dry marginal lands where the yields of maize were low or frequently lost because of drought, to which sorghum is more resistant. However, the breakthrough of the new crop did not came about until the late 1950’s, responding to the growth of meat production: unlike some other old world varieties of sorghum the variety grown in Mexico is not consumable by humans, solely by animals. From 1965 to 1980 the area of sorghum cultivation grew by 13 percent annually, compared to the expansion rate of 1.5 percent for all cultivation. In 1989 the total area of sorghum production was 1.5 million hectares, an area second only to maize (around 6 million hectares), that is, more than those of wheat or beans.

The productivity of sorghum grew even faster, with a rate of 18 percent per annum: the average yield per hectare is about 40 percent higher than that of maize; although the price per ton is lower than that of maize, the crop value per area unit remains higher for sorghum, making it a lucrative crop. In the 1960’s and 1970’s the guarantee price system of the government also favoured the adoption of sorghum cultivation. Sometimes even external socio-economic conditions have favoured sorghum over maize: sorghum is not susceptible to

[17] Paz Sanchéz, Fernando, *El campo y el desarrollo económico de México*, México: Editorial Nuestro Tiempo 1995, p. 125.
[18] Sanderson, Steven E., *La transformación de la agricultura mexicana: estructura internacional y política del cambio rural*, México: Alianza Editorial & Consejo Nacional para la Cultura y las Artes 1990, p. 87.
[19] This history is neatly traced in Barkin, David, *Un desarrollo distorsionado: la integración de México a la economía mundial*, México: Siglo XXI Editores & UAM 1991, pp. 44-51.

”midnight harvesting”, i.e. to theft, as is maize - a factor of real significance in the northern frontier regions where hundreds of thousands illegal immigrants cross the border each year. For the agribusiness sorghum is a gratifying crop also for the fact that it is easily mechanized and requires relatively little labour. Small wonder then that, in the end, at least 35 percent of sorghum is grown on irrigated lands, thus crowding out these most productive lands from crops for human consumption.

Despite the voluminous growth of sorghum production in Mexico it has not been sufficient: in the 1980’s a half of the demand was satisfied with imports from the United States. The ever-growing demand of sorghum has reflected the equally rapid growth of cattle, pork and poultry industries in Mexico, as three quarters of the feed grain output is sorghum. Combining the area used for feed production with that of cattle ranching gives the figure of 64 percent of the agricultural land being dedicated to meat production. However, the economic crisis of the 1980’s reduced substantially the capacity of the poor to regularly include meat in their diets, this meaning that sorghum production, sorghum importation and meat products industry serve to satisfy the consumption needs of only a part of the population (middle and upper classes). And while sorghum is an exceptional novelty crop in the sense that it is not being exported, it is nevertheless exceedingly internationalized and a good example of a product linked to the vertical integration: TNCs (like DeKalb, Pioneer, Asgrow, Northrup-King, Anderson Clayton, Ralston Purina, and others) supply all the hybrid seed needed, control most of the production of packaged, balanced animal feeds, and participate actively in the meat production and in the processing industry of meat products.

Another case, somewhat similar to the sorghum, is the dairy product sector: it is one of the most internationalized and vertically integrated agroindustrial sectors in Mexico, despite the fact that the products are consumed in the domestic markets. The production of powdered and condensed milk is up to almost a hundred percent controlled by a single company, Nestlé (since 1985, when Nestlé purchased its main rival, Carnation). Both these products have relatively more importance in Mexico than in the industrialized North: condensed (canned) milk is widely consumed by poor people with no refrigerators, and powdered milk is the most important raw material for further processed dairy products because it is cheaper than fresh liquid milk and because the supply of the latter is in any case inadequate. In order to satisfy the demand Mexico has been a net importer of

powdered milk from the United States in recent years; in fact, Mexico is the number one importer of powdered milk in the world.[20]

Curiously enough, in the North American Free Trade Agreement powdered milk was classified as one of the three most vulnerable products for Mexico, along with maize and beans, thus being granted a long transition period to total free trade: a tariff rate quota of 40 000 tons was set for the imports, corresponding to the average annual imports of the immediate pre-NAFTA years, and then the quota shall be raised by 3 percent each year, until after 15 years the imports will become completely free of tariffs. In effect, then, what was given special protection under this NAFTA clause was not domestic but foreign capital (in this case Swiss) controlling the production of powdered milk in Mexico. In addition to powdered milk, of all other dairy products only cheese production has a transition period of up to ten years before the imports become tariff free.

Consequently, the small producers of fresh liquid milk have been exposed to falling producer prices and to the competition of tariff-free imports from the United States. In the first year of NAFTA, in 1994, there were incidents of attacks on U.S. milk tanker trucks by the aggravated Mexican milk producers in the border regions of Tijuana and Juárez, reflecting the plight of the Mexican producers.[21] Actually about 36 percent of the liquid milk consumed in Mexico is imported. Already the production of liquid milk is highly polarized between specialized producer companies, with high inputs of imported technology (from milking machines to freezers) and with high-yielding, ”hybrid” cows, and small producers with no sophisticated technology and with ”traditional” species of cows: the former have 33 percent of cows but produce 70 of the milk. Small producers and even some of the specialized companies cannot compete for long with the more capitalized, streamlined and subsidized U.S. milk production. Even of the companies only the strongest will survive. At the present, there are 108 pasteurizing companies in Mexico, but the bulk of the pasteurized milk production is controlled by only six major companies, four of which belong to TNCs and two are national giants. Also, there are nearly 1 400 companies producing cheese, cream and butter, but a major share of the production is again controlled by a few giants, TNCs (Chambourcy, Kraft, Chipilo) and nationals (Nochebuena).[22]

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[20] McDonald, James H., NAFTA and the Milking of Dairy Farmers in Central Mexico, *Culture and Agriculture*, Number 51/52, Spring/Summer 1995, pp. 13-18 (p. 15).
[21] McDonald, art. cit., p. 17.
[22] Carmen del Valle, María del & Álvarez, Adolfo & García, Luis Arturo, El sistema de leche y lácteos en México: viabilidad y perspectivas de desarrollo, *Comercio Exterior*, vol. 46: 8, agosto de 1996, pp. 652-656.

Biotechnology and Agriculture

Recently, the surge of research and application of biotechnology has accompanied the internationalization in agriculture. Conforming a sort of ”second wave green revolution”, the full implications of biotechnology are not yet apparent. What is obvious, though, is that those implications are different in developed and in developing countries. While there are positive views that stress the new opportunities for the Third World agriculture (in areas like energy production with biomass gas and fermented combustibles, or in food, feed and forestry production with micropropagation), there are also strong reasons to believe that the benefits of biotechnological innovations do not reach the small farmer in a Third World country: that biotechnology enhances the dependency of the Third World agriculture on the technology imported from industrialized countries, increases the concentration of agroindustry and of rural landed property, benefits mostly large companies (and of them, especially the TNCs), and fortifies the existing patterns of agriculture which depend on credits, machines and agrochemicals.[23]

In respect to Mexico, the very few limited, sectorial case studies so far do not give definitive answers. However, the example of sugar production reveals the complexity of the issue. Presently, there is pressure in the United States to export maize-based fructose and other cane-sugar substitutes (like aspartam) to Mexico, mainly for the soft drink industry - which in the United States have already had their ”light choice” revolution in the consumption patterns - while the Mexican sugar-mill industry and cane-growers are, understandably, pressing against such imports. For the time being, the free trade agreement grants a few years’ time of protection for the Mexican sugar producers, but the U.S. agribusiness is pressing for a more rapid opening (not just the producers of sugar-substitutes but also the cane-growers of Florida). The situation is further complicated by the strong presence of both Coca Cola and Pepsi companies in the Mexican sugar production, as they have interests to protect both ways.[24]

Perhaps the greatest threat to developing countries is not biotechnology as such, but the accompanying trend for the exclusionary privatization of biotechnological knowledge: the more internationalized and technologically complex agro-food production has grown the more strict and binding the quests for intellectual property rights have turned. There is an exceptionally strong current seeking to

[23] Casas, Rosalba & Chauvet, Michelle: Biotecnología, agricultura, y ambiente: una recapitulación, *Comercio Exterior*, vol. 46: 10, octubre de 1996, pp. 834-845.
[24] Ibid., p. 841.

restrict and commoditize the use of transgenic plant species and other organisms. The GATT resolutions of December 1993 called for the signatory countries to adopt international intellectual property rights regime on plants and micro-organisms, this meaning that countries would deliberately restrict the hitherto free use of hybrid plant species and organisms and accept those becoming patented and licensed under the threat of economic retributions. The most active proponents of these enlarged property rights have been TNCs, whose research and development departments have the amplest capacities to produce new, modified and better sub-species of cultivated plants. Thus, somewhat paradoxically (which, of course, it is not), the most ardent protagonists of free trade are at the same time the most ardent protagonists of a more regulated and protected international commerce in this field. The World Trade Organization (WTO), founded to press and guide countries to adopt and enforce the GATT resolutions, has taken the intellectual property rights issue as one of its top priorities.

The effort of the TNCs has had some success: e.g., in October 1992 the U.S. Patent and Trademark Office granted the first species-wide patent ever to a single company, when U.S. based Agracetus, a subsidiary of the agroindustrial giant W.R.Grace, was granted a patent on all forms of transgenic cotton. In March 1994 the same company was granted a patent by the European Patent Office on genetically transformed soy-bean. The implications of this trend for developing countries are far-reaching. First of all, such species-wide patents are representing a threat to world food security, as they are steps towards monopolies over food crops. They also tend to discourage biotechnological research and development that is being carried out in public sector research institutes, especially in the Third World. What is more, such patents do not allow farmers to save seeds from these hybrid species for the next crop cycle without license payments, as it has been done routinely with open pollinated crops, like cotton and soy-bean. No wonder, then, that India, the third largest producer of cotton world-wide, has already revoked Agracetus's patent on cotton.[25] One can imagine that the consequences of this cotton patent can be substantial in Mexico as well. In 1995, cotton (and other vegetal fibres) as raw material and as textile products was the tenth largest category of Mexican exports, representing the value of over 1.5 billion dollars and 1.9 percent of all exports, oil and maquiladoras included. The competitiveness of Mexican cotton producers could be substantially reduced if they were prohibited to use better, gene-manipulated varieties or forced to pay

[25] (No author) Species-Wide Patents: Implications for Agricultural Research and Human Well-Being Questioned, *Culture and Agriculture*, nr. 49, Spring 1994, pp. 23-24.

license fees on their use. The cotton or soy-bean patents of Agracetus are just precedents, as similar patents will surely follow.

There is yet another aspect in the intellectual property issue: traditional peasants and indigenous peoples may possess detailed traditional knowledge (that is, intellectual properties) on plants and their uses (say, for medicinal purposes), but they lack the means and the know-how to advance their patent pendings if such an idea would ever occur to them (as they do not usually perceive this kind of knowledge as being anybody's private property). Thus, they face the possibility of this knowledge being expropriated of them by the legal departments of TNCs. There is something fundamental in Vandana Shiva's proposition that patent protection on this kind of intellectual property "block a free flow of knowledge from the formal sector of the North to the formal sector of the South while maintaining a free flow from the informal sector of the South to the formal sector of the North".[26] As Mexico hosts the fifth largest biodiversity in the world (in terms of the number of different plant and animal species) and a notable indigenous and traditional peasant population, this aspect may not be without real significance.

Agroindustrial Development and Rural Employment

An important social consequence of the internationalization and of the agroindustrial development in general has been the effect on rural employment in Mexico. According to a study, there are two central processes involved that reduce the demand for rural labour: changes in crop composition and new, labour-saving technology.[27] Despite the fact that crop yields have risen dramatically in many crops and the amount of irrigated hectares has also risen, in some cases allowing double-cropping (a winter and a summer crop on the same field), employment opportunities have been reduced. In crop composition more labour demanding crops, like maize and beans, have been replaced by crops demanding less labour, like sorghum, wheat or alfalfa: maize alone requires more labour days per hectare than double-cropping with sorghum and wheat. Yields have increased most in crops that are most easily mechanized. In addition, this development has not only meant low employment generation but also promoted both the temporality and seasonality of labour demand, destabilizing rural labour markets. What is more, rural employment could be further decimated by the

[26] Shiva's proposition citated in Grinspun, Ricardo & Cameron, Maxwell A., Nafta and the Political Economy of Mexico's External Relations, *Latin American Research Review*, vol. 31: 3, 1996, pp. 161-188 (p. 181).
[27] Wilcox Young, Linda, Labour Demand and Agroindustrial Development: The Evidence from Mexico, *The Journal of Development Studies*, vol. 30: 1, 1993, pp. 168-189.

biotechnological development, which favours large producers with more capitalized methods and offers yet new substitutes for traditional crop varieties.[28]

The most recent phase of internationalization, that of free trade under NAFTA, will most likely accelerate the loss of rural employment in Mexico. Most analysts seem to agree that the labour-intensive, traditional peasant sector will be severely hit by the elimination of subsidies and by the tariff-free entry of U.S. maize, beans and wheat - hence the 15-year transition period for the first two. There are contesting views on whether there will be substantial job creation in the manufacturing sector that would offset the loss in rural jobs or whether the net employment generation in Mexico remains negative, but no one foresees growth in rural employment opportunities due to NAFTA. It all points to the conclusion that an enhanced rural-urban and/or cross-border migration will follow.

According to an optimistic view of some World Bank economists, as quoted by Wilcox Young, increased employment in the labour-intensive fruit and vegetable sector will alleviate the job loss in the maize-producing peasant sector, but even this is doubtful, as it is based on the somewhat odd premise that there is no surplus labour in Mexico at the moment. But even if fruits and vegetables do create extra employment to a significant degree, the fact that those crops are grown for export mostly in the northern states of Mexico while the majority of maize-producing peasants live in the central and southern states would make the encounter of labour supply and demand very difficult and not without high social costs. Transforming the southern maize fields into competitive fruit and vegetable fields, in turn, would require enormous amount of new productive inputs (for transportation, storage, irrigation, machinery, etc.) and would still be impossible in most marginal lands, and not even taking into account the problem that the small average size of the peasant plot creates for the transformation. Agroindustrial capital, foreign or domestic, is in most cases not interested in such a task; investments will continue to flow to areas with an established production system of fruits and vegetables in large quantities. Also contract farming seems to favour relatively large units.[29]

Aside from the employment generation issue, the characteristics of the labour process itself under the internationalized and vertically integrated agro-food regime is also of relevance. It has been sometimes argued that the capitalized, mechanized and standardized production system in agriculture would create

[28] Casas & Chauvet, art. cit., pp. 842-843.
[29] Wilcox Young, Linda, Free Trade or Fair Trade? NAFTA and Agricultural Labor, *Latin American Perspectives*, vol. 22: 1, Winter 1995, pp. 49-58.

labour relations somewhat similar to those prevailing in industry and that a salaried agricultural worker would emerge that would resemble a Fordist factory worker with stable incomes, with semi-skilled professionalization and with union participation to reap fringe benefits; but, as Goodman and Watts convincingly argue, the reality in this respect has been totally different, labour conditions sometimes approximating to a sort of 'bloody Taylorism', with manipulation of the migrant or gender status of the worker and with limited unionism, even in the United States.[30] In Mexico, there is no fundamental difference between a worker in the sugar cane fields owned by the Pepsi Company through its affiliates and that of the past working on a sugar cane plantation owned by an absentee landlord - with perhaps less 'extraeconomic coercion' and with some new technology, the labour process itself remains the same. In a way, one can even see the present agro-food regime as a return to an 'archaic' type of labour exploitation: as Luis Llambi notes, the new trend towards greater flexibility in production with the attendant new forms of labour recruitment (both in agriculture and manufacturing) has meant that entrepreneurs, in their pursue of greater labour productivity, seek to "bypass most costs linked to the welfare legislation of the previous accumulation regime".[31]

Conclusion

In the internationalization of agriculture the question is not only of the expansion of foreign capital into fields of activities previously under the command of domestic, local capital. It is a comprehensive process that encompasses and entails a complex set of interrelated, smaller transformation processes, ranging from the control of production input technology to changing consumption patterns, food self-sufficiency of nations and employment issues. The Mexican agro-food sector is an illustrative case in this respect, as in Mexico there have been various factors that have made the case relatively more manifest than in many other parts of the world: e.g., Mexico was one of the original showcases of the Green Revolution, the agrarian sector beginning to attract capital in general and within it international capital in particular from relatively early on; also, the location of Mexico across the border from the world's largest single capitalist markets made it lucrative and natural especially for the U.S. capital to see Mexico as a locus of production and as a target for exports (of input technology as well as of surplus basic food and animal feed).

[30] Goodman & Watts, art. cit., p. 12.
[31] Llambi, art. cit., p. 190.

What has been particularly interesting in the Mexican case is the fact that the internationalization has taken place despite the existence of a large small-scale peasant sector, until very recently protected, to a degree, by the Constitution (Article 27) and various forms of domestic subsidies. Now, with the neo-liberal deregulation policies the peasant sector (especially that of *ejidos*) has been yet more opened to the competition of international capital. Added with the free movement of capital and goods under NAFTA, it is expected that the process of internationalization will be accelerated, resulting in an ever greater vertical and horizontal integration of the Mexican agro-food sector. This, in turn, will signify the growing role of TNCs - in effect, the growing subsumption or replacement of domestic Mexican agro-food capital and rural labour by transnational corporate capital.

Here it has been discussed of only some aspects of the complex phenomenon: the presence of foreign capital, the cases of sorghum and dairy products as examples, the new threat posed by the intellectual property rights demands of TNCs, especially in biotechnology, and the effects on rural employment. To be sure, there are other important aspects as well, not discussed here but meriting equal attention: the gendered labour practices linked to the agro-industrial production (a sort of ‘maquiladorization’ of production, say, in packaging exportable fruits and vegetables), or the environmental issues linked to the greater productivity demands that corporate capital brings in, to name only a couple.