The Maize Maze in Mexico

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> This perverse idea, that only money counts in business, has reached its apotheosis in the World Trade Organization – recognizing profit and loss, but not human rights, child labor, or the environment. If the WTO is our new, unelected world government, then it is government without a heart, and without a heart you find the creativity of the human spirit dwindles too.[1]
>
> - Anita Roddick, founder of The Body Shop

Maize and the Role it Plays

> There are more than fifty useful products which people use in their daily existence harvested from the "milpa" or corn field. In a modern corn field, usually only one product is produced: corn to be consumed by animals, and incidentally by the Mexican people.[2]
>
> - David Barkin

The American Heritage Dictionary defines corn as, "a tall, widely cultivated cereal plant bearing seeds or kernels on large ears" while defining maize as, "corn."[3] The difference between corn and maize is that maize is the traditional word and corn is the word chosen by European settlers. These definitions illustrate the European settler's lack of knowledge and respect for the many purposes of this amazing plant, especially its ceremonial uses. Out of respect for the indigenous peoples of Mexico, I will use the term maize rather than corn throughout my paper.

Mexican soil is home to the world's greatest diversity of maize and its supply of germplasm has greatly contributed to its global production. Maize is the most important

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[1] Anita Roddick. Take it Personally: A Globalization Action Guide. (Berkeley: Conari Press, 2001) p. 13. Roddick is an advocate of the belief that corporations can be both profitable and ethical.
[2] David Barkin. *NAFTA – No Solution to Mexico's Crisis*. Canadian Dimension, September 1992 v26 n6 p. 10. Barkin is professor of economics, Departmento de Produccion Economica, Universidad Automona Mextropolitana, Unided Xochimilco and a researcher at Centro de Escodesarrollo.
[3] The American Heritage Dictionary. (Boston: Houghton Mifflin Company, 1983) pgs. 156 and 411.

food product in Mexico both for its nutritional qualities and its source of livelihood for those who produce and market it. Unfortunately, the North American Free Trade Agreement (NAFTA) has severely threatened the ability of Mexican farmers to grow this important traditional crop and the ability of consumers to afford it. The genetic resources and indigenous knowledge needed to successfully produce maize in a multitude of microclimates has also become seriously threatened. The Mexican government's willingness to comply with NAFTA's shortsighted policies is creating massive displacement and forcing maize's traditional growers into various sectors of the global economy. NAFTA has opened Mexico's border to United States grown corn, which has flooded the Mexican marketplace. Local and global food security for the new millennium is already in great jeopardy. My study of United States corn's grand arrival into the Mexican marketplace will focus on the question: How has opening the border to U.S. corn impacted traditional Mexican agricultural production?

It is an accepted fact that maize originated in Mexico and that Mexican farmers have played a priceless role in the genetic development of the plant through careful planning, production, and perhaps most importantly, the selection of seeds from one harvest to the next. Many distinct varieties of maize developed due to numerous microclimates found throughout Mexico. The germplasm bank maintained by CIMMYT (the International Center on Maize and Wheat) in Mexico has 10,965 accessions [additions], of which Mexican varieties comprise one third.[4] The Mexican government-owned gene bank managed by INIFAP (the National Institute for Agricultural and

[4] Alejandro Nadal. *Corn and NAFTA: An Unhappy Alliance*. Seedling, The Quarterly Newsletter of the Genetic Resources Action International (GRAIN) June 2000, p. 1.

Forestry Research) has an additional 570 accessions.[5] Mexican maize varieties have been used throughout the world and in a wide variety of climates to improve factors such as yield, pest resistance, drought resistance, growth cycle, and protein content.

It is expected that most of the demand for maize will come from developing countries during the 21st century.[6] Greater yields will be needed since little additional land is expected to be used for the cultivation of maize in these developing countries.[7] Mexican maize's genetic properties will once again play an important role in improving global production.[8]

Despite Mexican maize's great importance to the entire world for it's genetic variability and the critical role maize plays in the lives of Mexicans, NAFTA threatens the ability of Mexican farmers to continue to grow this important crop, the ability of consumers to afford it, and perhaps most importantly the ability of Mexican growers to conserve and develop maize's genetic resources.[9] The United States, Canada, and Mexico negotiated NAFTA between 1992 and 1993. Alejandro Nadal, the coordinator of the Science and Technology Program at El Colegio de Mexico, states that the single most important element in NAFTA was probably the inclusion of Mexico's most important crop – maize.[10] More than one fifth of Mexico's working population of 39 million people are employed in the agricultural sector and somewhere between two and a half and three million of these are maize growers, mostly of indigenous descent.[11]

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[5] Ibid. p. 2.
[6] Ibid. p. 2.
[7] Ibid. p. 2.
[8] Ibid. p. 2.
[9] Ibid. p. 1.
[10] Ibid. p. 2.
[11] Ibid. p. 2 and Karen Lehman and Al Krebs. *Control of the World's Food Supply* in The Case Against the Global Economy and For a Turn Toward the Local. (San Francisco: Sierra Club Books 1996) eds. (Mander and Goldsmith) p. 126.

A Forced Migration

> The best wall against massive immigration to the U.S. is a free, just, and democratic regime in Mexico. If Mexicans could find in their own land what is now denied them, they would not be forced to look for work in other countries. By supporting the dictatorship of the state party system in Mexico, whatever the name of the man or the party, the North American people are supporting an uncertain and anguishing future. By supporting the people of Mexico in their aspirations for democracy, liberty, and justice, the North American people honor their history… and their human condition.[12]
>
> - Subcommander Marcos, leader of the Zapatistas

Proponents of the global economy say that the rules for trade should be based on comparative advantage. Comparative advantage in this case is the idea that countries should export goods that they can produce inexpensively while importing goods, which they can purchase on the international market cheaper than they could produce them in their own country. Therefore, if Mexico can buy maize at a lower cost in the international market than it can be produced domestically, it should give up on domestic maize production and sell products such as tomatoes to countries that can not produce them as cheaply. This type of reasoning is at the root of international agreements such as the General Agreement on Tariffs and Trade (GATT) as well as NAFTA, and the World Trade Organization (WTO).

While comparative advantage may seem like a good idea, there are two primary problems with this type of economic reasoning. First, it forces countries to depend on

[12] Subcommander Marcos in his letter to the people of the USA. The letter is from the Mexican South Insurgent. Mexico, September 13, 1995. Reprinted in: Roddick. Take it Personally. p. 121. Although Marcos is not Mayan himself, he has dedicated himself to helping the indigenous people in the jungles and mountains of Chiapas. His regular communiqués through the Zapatista Army of National Liberation (EZLN) website Ya Basta! -"enough is enough"- have mobilized global opinion on behalf of the Zapatistas.

foreign suppliers and international trading companies. Second, countries will implement policies that are destructive to their own citizens to maintain their comparative advantage in a given marketplace.

Mexico is a major example of this point. In rural Mexico, millions of farmers have been driven off the land through polices implemented under the guise of improving their economic condition utilizing the theory of comparative advantage. Barkin writes, "The Mexican government decided that it was more cost effective to import food than to allow 'inefficient' peasants to continue to fill their lands."[13] Public polices made credit and technical assistance unavailable to peasants so they were not able to increase their productivity. Without the compensation of adequate prices, many families were forced to reduce their plantings and abandon their farms.

Until Carlos Salinas de Gortari became president in 1988, Mexico attempted to protect its maize production system from artificially cheap U.S. corn.[14] Maize is growing on half of the cultivated land in Mexico and is as important culturally as it is economically. However, to ensure the passage of NAFTA, Mexico initiated a series of reforms in the agricultural sector, including the breakup of ejidos and threw away its right to protect maize under NAFTA.[15]

Article 27 of the Mexican Constitution guarantees land distribution to the poor, but in order to join NAFTA, the Mexican government rewrote Article 27.[16] Article 27 was the legal basis for land reform, which declared the land and natural resources to be property of the state. Land titles were granted not to individuals but directly to villages in

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[13] Barkin. *NAFTA – No Solution to Mexico's Crisis* p. 3.
[14] Lehman and Krebs. *Control of the World's Food Supply* p. 126
[15] *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*. (San Francisco: Global Exchange, 1997) p. 4.
[16] Ibid. p. 3.

collective holdings called *ejidos*.[17] Land was promptly sold off to the highest bidding multinational corporation, thus effectively breaking up ejidos.[18] This led economists to predict that between seven hundred thousand and ten million farmers would be displaced during the decade after NAFTA took effect.[19] After 18 months of NAFTA, 2.2 million Mexicans had lost their jobs, and 40 million had fallen into extreme poverty.[20] This pattern is certainly not limited to Mexico and is creating overpopulation in the urban cities throughout the world.

When Will the Market Be Open?

> Probably about half the population can barely get enough food to survive, while the man who controls the corn market is still on the list of billionaires which is the one category in Mexico that ranks pretty high.[21]
>
> \- Noam Chomsky

Opening up the Mexican market had been a goal of the North American corn producers' lobby since the 19th century. Many years later, efforts to consolidate the world's food supply intensified through agreements such as GATT. U.S. agribusiness companies such as Cargill, the world's largest grain-trading company, have either been the ones setting trade policies or have had direct ties to the people setting trade policies.[22]

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[17] Joel Simon. Endangered Mexico: An Environment on the Edge. (San Francisco: Sierra Club Books, 1997) p. 40.
[18] *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*. p. 4.
[19] Lehman and Krebs. *Control of the World's Food Supply* p. 126.
[20] Vandana Shiva. Stolen Harvest: The Hijacking of the Global Food Supply. (Cambridge: South End Press, 2000) p. 9. Shiva is a world-renowned environmental thinker and activist. Her credentials include the position as Director of the Research Foundation for Science, Technology, and Natural Resource Policy.
[21] Noam Chomsky. Latin America: From Colonization to Globalization. (Melbourne: Ocean Press, 1999) p. 98. Chomsky is a philosopher, scholar, political activist, and professor of linguistics at Massachusetts Institute of Technology (MIT).
[22] *Ann M. Veneman: Agricultural Secretary* Center for Responsive Politics http://www.opensecrets.org/bush/cabinet/cabinet.veneman.asp and *The Revolving Door: US Government &*

President Nixon's first trade advisor was William Pearce, a vice president of Cargill and another Cargill representative, Daniel Amstutz, drafted the U.S. agricultural proposal for GATT for President Reagan.[23] With an annual production of 240 million tons, the U.S. is the largest producer of corn in the world, and thus has the power to set the international price of this basic commodity.[24] It was the perspective of the Mexican government that including maize in NAFTA would enable the country to concentrate on more labor-intensive crops and to free up the financial resources used to subsidize inefficient maize producers. Mexican consumers were promised that they would benefit from lower prices by purchasing corn grown in the U.S.[25]

An important aspect of NAFTA was the immediate replacement of the corn tariff system with a tariff-rate quota (TRQ) system. The TRQ system tried to make domestic prices equal to international prices by gradually phasing out tariffs on all imports over a fifteen-year period starting in 1994. The goal of this system, known as trade liberalization, was to protect domestic producers during the transition period, but it does not work. In reality, all corn imports since 1994 have been tariff-free.[26] The failure of the Mexican government to implement effective TRQs eliminated all protection barriers for domestic maize producers. This led to a 50% drop in the price of corn between 1994 and 2000 and thus made domestic maize equal to the international price of corn.[27] Millions of maize farmers knew that they were in jeopardy of losing their land and much of their culture. PROCAMPO, the support mechanism established in 1994, lost half of its

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University Researchers Go Biotech…. …and Back Again. A Question of Ethics. http://www.mindfully.org/GE/Revolving-Door.htm

[23] Lehman and Krebs. *Control of the World's Food Supply* p. 124.

[24] Nadal. "Corn and NAFTA: An Unhappy Alliance." p. 2.

[25] Ibid. p. 2.

[26] Ibid. p. 3.

[27] Ibid. p. 4.

value in real terms and was insufficient to compensate producers for the price reductions.[28]

Public support for the Mexican agricultural sector experienced reductions in several key areas such as credit, infrastructure, research and development, and technical assistance during these six years. The major public sector agency used to regulate support prices for basic agricultural commodities was dismantled in 1998, long before it could fulfill its role in the fifteen-year transition period.[29] Therefore the problems for Mexican maize farmers needs to be looked at in the context of reduced prices, reduced credit, and reduced investment in infrastructure and other public support mechanisms.

From the Mexican government's perspective, including corn in NAFTA would enable the country to focus on more labor-intensive crops and to free up the fiscal resources used to subsidize inefficient corn producers.[30] Most Mexican maize growers rely on a great variety of landraces as their protection against crop failure. Landrace refers to a locally-adapted strain of a species bred through traditional methods of directed selection.[31] The United States on the other hand has a system of very capital-intensive agricultural production utilizing heavy machinery, synthetic chemical inputs, and hybrids of corn known as high-yielding varieties (HYV).

The United States' capital intensive system is not sustainable in the long-term for many reasons,[32] however in the short-term it has proven to yield far greater harvests per

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[28] Ibid. p. 4.
[29] Ibid. p. 4.
[30] Ibid. p. 2.
[31] Stephen R. Gliessman. Agroecology: Ecological Processes in Sustainable Agriculture. (New York: Lewis Publishers, 2000) p. 342.
[32] *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*. p. 4. The "inexpensive" U.S. corn freely imported is in truth heavily subsidized by farming practices that cause depleted topsoils, depleted and poisoned aquifers; practices that use herbicides and pesticides, poisoning water, soil, plants, animals, as well as humans; and practices that consume tremendous quantities of dwindling reserves of oil.

acre giving them the comparative advantage in production. The climate of the mid-western United States is ideal for this type of high-input farming and has led to enormous amounts of land dedicated to corn monocultures year after year, and the specialization in only a handful of varieties. Unfortunately, the environment is suffering, sustainability is doubtful, and genetic diversity is all but gone as a result of the U.S. system of high-intensity agricultural production. One example of the vulnerability of high-input agricultural systems is a disease known as Southern corn leaf blight which wiped out 25% of the U.S. corn crop in 1970.[33]

Minding the Maize

> The end result of a NAFTA-driven economy is a final knockout blow to the ancient self-sufficient, small corn farming economy of Mexico's Indigenous communities. Indigenous land, more than ever, is vulnerable to corporate and elite buy outs and foreign competition from the United States. Landless refugees everywhere![34]
>
> \- *Global Exchange*

Each year, Mexico's maize farmers engage in the traditional activity of selecting seeds to sow in their fields. The seeds are chosen according to their ability to respond to the environmental and physical characteristics of the regions in which the farmers operate. The land available to these farmers is usually in mountainous areas and their plots are subjected to an irregular rainfed regime.[35] They must be able to work on sloping terrains with poor soils, strong winds, early frost, and diverse pests. In the

[33] Ibid. p. 5.
[34] *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*. p. 4.
[35] Nadal. "Corn and NAFTA: An Unhappy Alliance." p. 5.

lowlands, close to the coastal plains or in some inland depressions, the tropical environment makes for difficult production and post-harvest conservation conditions due to pests and poor soils.

Seeds are selected based on their history of pest resistance, fungi resistance, or even to grow when the first rains are interrupted and plants are at their most vulnerable stage of growth. Varieties that are known to produce early are important for mountainous areas susceptible to frost. In tropical climates, an important seed characteristic is the hardness of the pericap (protective coating surrounding the seed), which keeps the seeds viable for long periods.[36]

In the mountainous areas of Mexico, farmers normally sow at least two corn varieties, one which is less productive but matures early and is capable of surviving the early frosts, and one which is more productive but slower to mature.[37] Many communities plant up to eight varieties of maize. The most important factors determining seed selection are the type of soil, drought and wind resistance, response to inputs, vulnerability to weeds, optimum periods of fertility, yield, final uses (sale, domestic, ritual), post-harvest conservation and dietary considerations (flavor, grain texture, and color).[38] The seed usually exhibits high performance in just one or two of these categories thus making seed selection critical to successful maize production.

Both the Mexican and U.S. governments have ignored the fact that the best U.S. hybrid seeds would be out performed by Mexico's landraces in most of the environments in which corn is planted in the U.S. Poor soil fertility often causes hybrids to yield less than local landraces. The ability of local landraces to outperform modern high-yield

[36] Ibid. p. 5.
[37] Ibid. p. 6.
[38] Ibid. p. 6.

hybrids under stressful conditions is based on the plant's excellent adaptive features and this explains why penetration of hybrids in corn production has never reached the high rates obtained in wheat production.[39] In Mexico the use of hybrids is limited to about 25% of the maize fields.[40]

Mexican growers that rely on local landraces are usually the poorest producers, have very little access to land, little or no access to credit, minimal use of synthetic chemical inputs, and usually no mechanization. The only way that these people can continue to produce maize is through the use, conservation, and continued development of genetic resources. Inherent in NAFTA is the logic that these poor maize farmers should cease their traditional practice of maize production to allow the economy to become more financially efficient.[41]

The idea of becoming more financially efficient is a key component of the comparative advantage theory and adding value to products with cheap labor. GATT, NAFTA, and WTO support the transformation and forced migration of traditional maize producers into oppressive sectors of the global economy which include working for labor-intensive, export-orientated transnational agribusiness corporations in regions such as the Bajio or in maquiladoras located throughout Mexico, especially along it's northern border with the U.S.[42] In addition to the farmers who take jobs with agribusiness corporations and the wide-variety of corporations operating maquiladoras within Mexico, many traditional subsistence maize farmers and other small and mid-sized agricultural

[39] Ibid. p. 6.
[40] Ibid. p. 6.
[41] Ibid. p. 7. and *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*. p. 3.
[42] John Borrego. Office Hours. November 14, 2001.

producers are also migrating to urban and rural areas of the U.S. in search of employment opportunities.[43]

Biopiracy: The Exploitation of Life and Indigenous Knowledge

> 95% of patents on life or life processes are held in industrial countries, despite the fact that 90% of the world's biological resources are found in developing countries.[44]
>
> - *La Jornada,* 4/8/00

Mexico, especially the predominately indigenous Southern States, has been exploited for centuries for resources such as oil, coffee, sugar, maize, and hydroelectric power.[45] Pharmaceutical and agricultural biotechnology corporations see Mexico's amazing ethnic and biodiversity (the diversity of all living things found in the natural world) and the indigenous knowledge that goes along with it, as "green gold" waiting to be discovered, patented, and sold for enormous profits. Although the latest attack on indigenous Mexican society may be more subttle than the effects of colonization, impoverishment, marginalization, and military occupation, biopiracy is just as, if not more, dangerous to indigenous peoples.[46]

Biopiracy can best be defined as the illegal appropriation of life – microorganisms, plants, and animals (including humans) – and the traditional cultural knowledge that accompanies it.[47] Biopiracy violates rules set forth at international conventions and the domestic laws of many countries. In addition, biopiracy does not

[43] John Borrego. Office Hours. November 14, 2001.
[44] *La Jornada*. Newspaper. Mexico City, 8 April 2000.
[45] *Biopiracy: A New Threat to Indigenous Rights and Culture in Mexico* (San Francisco: Global Exchange, 2001) p. 1.
[46] Ibid. p. 1.
[47] Ibid. p. 2.

respect, compensate, or even recognize the rightful caretakers of the life forms appropriated or the traditional knowledge related to their growth, use, and marketable applications. The vehicle permitting the grand theft known as biopiracy operates through the application of Intellectual Property Rights (IPR) to genetic resources and traditional knowledge.

Before biopiracy becomes a reality, an exploration known as bioprospecting must take place. Bioprospecting is the search for biological resources and accompanying indigenous knowledge - primarily for the purpose of commercial exploitation.[48] In and of itself, bioprospecting does not pose a threat to indigenous peoples or indigenous knowledge, however it does necessarily precede biopiracy. To clarify, bioprospecting is a tool for identifying biological resources and traditional knowledge with commercial potential while biopiracy represents the appropriation of these resources and traditional knowledge without obtaining Prior Informed Consent (PIC) or awarding adequate compensation.[49]

Capitalism values resources for their economic potential, accessibility, and monopolistic capabilities. Biodiversity is the backbone of food security and basic health needs as well as a highly strategic resource with commercial potential for the foods, pharmaceuticals, cosmetics, biotechnology, veterinary science, seeds and agrochemicals industry. The emerging genetic engineering sector views biodiversity as an untapped resource with enormous financial worth. In fact, commerce involving biological products and processes now accounts for almost half of the world economy, with profits concentrated in the emerging "life science" industry (food, pharmaceutical, and

[48] Ibid. p. 2.
[49] Ibid. p. 2.

agricultural production).[50] Countries with exceptionally high levels of cultural and biological diversity, such as Mexico, are considered to be regions of "mega-diversity" and are therefore the focal points of biopiracy.[51]

Biodiversity is being threatened on many fronts. Natural resource extraction (such as mining, oil drilling, and hydroelectric power generation), genetic contamination caused by the deliberate or unintentional crossing or drifting of genetic material through pollen transfer, industrial logging, carbon dioxide emissions, desertification (land that becomes washed of vital nutrients from years of unsustainable practices), and the disappearance of indigenous cultures all contribute to the loss of biodiversity.[52] Biodiversity and indigenous cultures thrive together while a decline in one coincides with a decline in the other. Depletion of biodiversity immediately effects indigenous cultures, however the loss of indigenous cultures represents a loss to the cultural wealth of humanity and along with that goes the loss of traditional knowledge for sustainable uses of biodiversity.

In the study of global economics, we are witnessing unprecedented monopolistic control of agrochemicals, seeds, processed foods, and pharmaceuticals. There are several other key sectors of society that have been monopolized, such as telecommunications and main-stream media, but all four of these previously mentioned sectors fall into the relatively new category of industry known as "life science." Life science corporations are the dominant perpetrators of biopiracy.[53]

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[50] Ibid. p. 2.
[51] Ibid. p. 2.
[52] Ibid. p. 2. and Pat Roy Mooney. "*The ETC Century*" Rural Advancement Foundation International (RAFI), 2000.
[53] Ibid. p. 3

The process of biopiracy can be understood generally as reducing life and knowledge to a marketable commodity. In comparing colonization to biopiracy, Vandana Shiva writes, "Five hundred years after Columbus, a more secular version of the same project of colonization continues through patents and intellectual property rights."[54] Shiva also goes on to state, "The freedom that transnational corporations are claiming through intellectual property rights protection in the GATT agreement on Trade Related Intellectual Property Rights (TRIPS) is the freedom that European colonizers have claimed since 1492."[55]

The ownership of life forms and traditional knowledge is referred to as the privatization of life. Individuals or corporations can claim ownership of life forms and traditional knowledge via IPRs. A particularly disturbing example of privatization and monopolistic control is the current case in South Africa in which 39 pharmaceutical corporations are suing the South African government for its distribution of low cost medications to 4 million HIV positive citizens this demonstrates the detrimental effect of IPR on public health.[56] The pharmaceutical corporations claim the distribution program is an infringement of their patent rights.

Multinational corporations partake in bioprospecting and biopiracy in collaboration with intermediary bodies – including universities, governments and non-governmental organizations – which are able to contribute expert yet relatively low-cost field research and input and are generally better placed to gain access to biodiversity "hot

[54] Vandana Shiva. Biopiracy: The Plunder of Nature and Knowledge. (Boston: South End Press, 1997) p. 2.
[55] Ibid. p. 2.
[56] *Biopiracy: A New Threat to Indigenous Rights and Culture in Mexico* pgs. 3 and 4.

spots."[57] In return for their services, intermediary partners usually receive funding through grants, scholarships, or technological hardware.[58]

Traditional knowledge is important for the commercialization of life products and processes, but indigenous peoples do not patent their traditional knowledge and products for several reasons. The concept of indigenous peoples patenting their own knowledge, resources and products is virtually non-existent due to extremely high costs and more importantly, cultural values.[59] Patents reflect the reductionist ideology of western culture including the pursuit of wealth and private ownership. This ideology is far from the indigenous values rooted in communal living, shared resources, and the interdependence of all living things.[60]

Mexico, particularly Chiapas, is targeted for biopiracy because of its geographic diversity, geologic complexity, and it numerous niche climates. The abundant biodiversity of Mexico is in part due to serving as a species bridge between two very different regions, North and South America. Mexico contains 34 of 36 identifiable ecoclimates, 25 of 28 recognized types of soil, and 14.4% of all living species in the world while containing only 1.3% of the world's landmass.[61]

[57] Ibid. p. 4.
[58] Ibid. p. 4.
[59] Ibid. p. 4.
[60] Ibid. p. 4.
[61] Ibid. p. 4.

The Connection Between Genetic Diversity and Subsistence Farming

> The process of genetic erosion mediated through the disappearance of the institutional and social base is one of the major threats to Mexico's corn growers and their capacity to improve their livelihoods.[62]
>
> - Alejandro Nadal

Maize's genetic diversity is also related to the presence of many different indigenous communities with connections to maize both for pure subsistence as well as traditionally rooted cultural and social processes. Knowledge is limited by language. For example, many local languages identify more stages of plant development and a richer plant anatomy than conventional botanical literature.[63] Cultural knowledge and collective efforts by communities with strong social, family, and ritual bonds to plant and harvest maize play vital roles in the biodiversity of maize.

Factors at the household, social, and institutional levels affect conservation, selection, and development of genetic resources. At the household level, older generations pass down the knowledge needed to select seeds based on environmental conditions. Farmers trade resources with farmers in other communities and experiment with multiple varieties, which adds layers to the dynamic process in which landraces are used, preserved, and refined. Without proper living standards and the support of larger institutions, this educational process is greatly jeopardized. Economic pressures have deteriorated the social fabric that sustains the conservation and development of irreplaceable genetic resources. Recent research has revealed that the propensity to migrate is stronger in areas where poor corn growers using local landraces operate.[64]

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[62] Nadal. "Corn and NAFTA: An Unhappy Alliance. p. 10.
[63] Ibid. p. 8.
[64] Ibid. p. 9.

The effects of economic polices are multi-dimensional and can not be isolated and examined for only one class of people. A flooded maize market forces out mid-size producers while the poorer farmers who relied on these farms for supplemental employment are driven to other sectors which include, but are not limited to employment in maquiladoras or export-oriented, labor-intensive agricultural production referred to as agro-maquilas. Other sources of income, such as basket weaving and knitting, are also affected by the drop in rural wages because of reduced demand.[65]

A great pressure is then exerted on resources, such as land, which have become increasingly scarce. For example, proponents of NAFTA cite an apparent stability in the production of maize as proof that the drop in maize prices resulting from increased imports is not effecting subsistence farmers, but often do not mention it is the result of more land being devoted to maize production.[66] The continuing development and cultivation of land is not an indication of economic health, but rather a response by increasingly desperate maize farmers whose yields are decreasing. Subsistence farmers are being pushed to a threshold beyond which they can not survive.[67]

Only a very shallow understanding of subsistence farmers was taken into consideration when studies for NAFTA were drafted. It was assumed that these farmers would not be negatively effected by price reductions and that they would actually benefit from the reduced price of tortillas. This assumption ignores the fact that subsistence farmers must still fulfill their needs with marketed goods requiring cash. Household income is generated through various sources: local off-farm labor, remittances from

[65] Ibid. p. 9.
[66] Ibid. p. 9.
[67] Ibid. p. 9.

migrant workers, and petty sales of grain.[68] Petty sales take place in a buyers' market (a market known for low consumer prices). The grain sales are later replaced in a sellers' market (high prices paid to the retailer). If the grain deficit is not replaced, the household will have to buy tortilla dough [called masa] later, exacting even higher costs.[69]

MASECA and MINSA: Free Trade Flour vs. Traditional Tortillas

> A state-managed economy is giving way to NAFTA and freed-up trade. Right now the industry is just getting used to the liberalized environment. You have to remember that for decades the industry was government-controlled. The difference between then and now is enormous.[70]
>
> - Francisco Rivero

The most important staple in Mexico is maize. Tortillas are commonly eaten with a filler meat and used in tostadas, flautas, chalupas, sopes, chimichangas, and enchiladas. Unfortunately, many people in Mexico lack the financial resources needed for such meals and therefore the tortilla is all there is to eat. Thirteen million children living in what the government calls "extreme poverty" derive 80% of their caloric intake from tortillas, according to studies by Dr. Adolfo Chavez at the National Nutrition Institute.[71]

Rural peoples prepare tortillas made from locally grown maize each day to satisfy nutritional and cultural demands. The process begins by chopping wood, creating fire, and grinding red, blue, or purple corn in a stone matate. A large clay comal (griddle) is placed above the fire and doughy maize discs are then placed onto the hot surface. These

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[68] Ibid. p. 9.
[69] Ibid. p. 9.
[70] Francisco Rivero as quoted in Robert Donnelly's article *Tortilla Riddle* (Mexico City: Business Mexico, October 1999) p. 6. Rivero covered both MINSA and MASECA, the two biggest players in the tortilla market, at Mexico City brokerage Valores Finamex.
[71] John Ross. *Tortilla Wars* The Progressive, June 1999 v63 i6 p. 34 of the magazine, p. 3 of the article.

traditional tortillas are still prepared in homes in the rural country side as a tradition handed down from mother to daughter. Young girls often grow up helping their great-great grandmothers in this important daily ritual.

In the majority of the tortillerias in the nation, maize dough is still the primary source for tortillas. However, corn-flour has made tremendous inroads in the tortillerias, especially in urban areas such as Mexico City. While corn dough still has at least 50% of the market because of taste and tradition, Mexican society is continuing to concentrate in urban areas where working hours, scheduled meal times, and eating habits are markedly different than in the country and therefore creating the need for the convenience of purchasing corn-flour tortillas.[72] Traditional tortillas created from ground maize-kernels of ancient seed stock produce a thick, sturdy tortilla while tortillas sold in Mexico City are often thin as toilet tissue and crafted from a corn-flour mix rather than the whole kernel.[73] Corn-flour tortillas are cheaper, lighter, and last longer than traditional tortillas, plus they have the backing of very powerful multinational corporations such as Archer Daniels Midland (ADM) and the worlds largest privately owned corporation, Cargill.[74]

The Maseca-Gruma empire, a company of which ADM owns 22%, markets most of the corn-flour mixture.[75] The flood gate, or US / Mexico border as it is commonly known, was pried all the way open with the passage of NAFTA, thus spilling cheap, high-tech corn-flour from the United States and Canada into Mexico. Although imports were supposed to rise gradually over a fifteen year period, this was never the case as demonstrated by the fact that fourteen million tons were bought in 1998, almost tripling

[72] Donnelly. *Tortilla Riddle* p. 1.
[73] Ross. *Tortilla Wars* p. 2.
[74] Ibid. pgs. 2 and 3.
[75] Ibid. p. 2.

pre-NAFTA levels and exceeding limits set by the free trade treaty by millions of tons.[76] Farmers in Mexico do not stand a chance against this subsidized surplus of corn-flour and they continue to be driven off their land.[77]

Taking the place of traditional small scale subsistence farmers are transnational corporations specializing in corn-flour, mainly Cargill and ADM. Striking statistics demonstrate the increasing dominance of Cargill. In 1998, Cargill reported sales of $51 billion – roughly the equivalent of Mexico's entire federal budget.[78] According to industry estimates, in 1998 Cargill accounted for 40% of Mexico's grain imports and bought up to 10 percent of the harvest.[79] This increased share of the market is very substantial.

Dry flour is lighter and more easily transported than wet maize dough. A longer shelf-life of about 24 hours also leads many consumers and retailers to prefer dry flour. Hubert Ehril, CFO of Minsa, claims that the flour process is safer, and that the enforcement of environmental laws could spell doom for millers, who create cesspools by dumping lime and other organic waste into sewers during the processing of maize dough.[80]

Another turn of events that is keeping maize dough out of the reach of many people was the decision in 1999 of Ernesto Zedillo and the Mexican Government to dismantle Conasupo, the federal grain distribution agency.[81] The agency was first established sixty years ago to feed the poor and keep farmers on the land.[82] Flour

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[76] Ibid. p. 2.
[77] Ibid. p. 2.
[78] Ibid. p. 3.
[79] Ibid. p. 3.
[80] Donnelly. *Tortilla Riddle* p. 3.
[81] Ibid and Ross. *Tortilla Wars* p. 3.
[82] Ross. *Tortilla Wars* p. 3.

producers upped their market share from 20% in the early 1990s to almost 40% by 1996, due mainly to the privatization of MINSA, the second biggest tortilla corporation, and a trend toward a more laissez faire (less government control) market.[83] MASECA and MINSA are not currently in competition with each other, but rather with the traditional tortillas. These companies are targeting their efforts at tortillerias, which are very reluctant to switch to corn-flour due to a decreased customer demand and knowing full well that their customers can go down the street and purchase the traditional maize dough tortillas. Preference is one thing, and reality is another. Many people simply can not afford the premium price charged on traditional tortillas and must therefore switch to the less expensive corn-flour variety despite their preference for traditional tortillas.

Overtime, the 1999 demise of Conasupo will be to the disadvantage of traditional grain millers who depend on cheap subsidized corn to compete with flour producers.[84] In addition to the important loss of Conasupo, millers also lack international resources such as financing and storage facilities, which help MINSA and MASECA, participate in the global economy.[85] Francisco Rivero, former head of analysis for Valores Finamex brokerage in Mexico City, sums up the advantages flour has over maize by stating, "MASECA … has a team of people who can monitor prices and buy high quality corn. Moreover, a strong balance sheet can allow them to incur prolonged expense in order to get consumers to make the switch."[86] By incurring prolonged expenses, MASECA has

[83] Donnelly. *Tortilla Riddle* p. 2.
[84] Ibid. p. 3.
[85] Ibid. p. 3.
[86] Ibid. p. 3.

forced people to make the switch to corn-flour by selling below costs, thus draining out the competition and controlling the price and market for tortillas.[87]

An example of the significance of NAFTA in the tortilla supply is demonstrated by an event, which took place in 1995, the treaty's second year, when imports began to drastically rise. U.S. and Canadian yellow feed corn is considered to be inferior to traditional maize and is supposed to be consumed only by animals. This was made clear when shippers started to pump green dye into the boxcars of corn headed for Mexican livestock. Within weeks, green tortillas started showing up at many of the nations 40,000 tortillerias.[88]

NAFTA Tills Mexico's Soil for the Violence of Biotechnology

> Corn genetically engineered to contain a toxin produced by Bt, Bacillus thurengienis, comes courtesy of the North American Free Trade Agreement, which opened the Mexican market to cheap grain from el norte.[89]
>
> \- John Ross

Mexico has been contaminated with DNA from genetically modified maize.[90] After extensive research and testing, Dr. Ignacio Chapela, a microbial ecologist at UC Berkeley's Department of Environmental Science, Policy and Management, and David Quist, a UC Berkeley graduate student, claim they have discovered transgenic organisms

[87] Ibid. p. 3.
[88] Ross. *Tortilla Wars* p. 4.
[89] John Ross. *Tinkering with the Tortilla: US Dumping Genetically Engineered Corn in Mexico*. Sierra Magazine, September 1, 2001 p. 1.
[90] Susan Ferriss. *Battle lines drawn in Mexico; Native corn to sacred to 'infect'?* Atlanta Journal and Constitution, February 28, 2002 p. 2.

in samples of maize taken from remote areas of Oaxaca.[91] Both the Mexican Ministry of the Environment and a peer-reviewed article in *Nature* magazine confirm the work of these researchers.[92] There are conflicting opinions as to whether GM pollution extends into the gene bank operated by the International Maize and Wheat Improvement Center (CIMMYT), the world's most important storage facility for endangered maize seed diversity.[93] According to an article in *Nature Biotechnology* (January, 2002) Chapela is warning that the maize gene bank at CIMMYT outside of Mexico City is already contaminated with genetically modified (GM) material.[94] CIMMYT has undertaken its own investigation and by February 22, the lab insisted that they have found no contamination and the organization has adopted measures that it believes will prevent GM maize from entering its gene bank, preserving at least some of Mexico's maize diversity.[95]

Discovering GM maize in the mountains of Oaxaca may be surprising to some people since the Mexican government bans the planting of GM corn and the agriculture industry has long contended that contamination from GM crops was extremely unlikely.[96] Chapela acknowledged, "I knew it was a difficult fray we were getting ourselves into."[97] Although there is no evidence that GM corn presents a danger to humans, Chapela and his allies are concerned that GM corn might pose a threat to corn's biodiversity.[98]

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[91] Charles C. Mann. *Has GM Corn Invaded Mexico?* Science March 1, 2002 Vol 295, p. 1617.
[92] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. January/February 2002 Issue # 74 p. 1.
[93] Ibid. p. 1.
[94] John Hodgson. *Doubts linger over Mexican corn analysis*. Nature Biotechnology, January 2002, p. 3.
[95] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 1 and Charles C. Mann. *Has GM Corn Invaded Mexico?* p. 5.
[96] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills*. Newsweek, January 28, 2002, p. 1.
[97] Ibid. p. 1.
[98] Ibid. p. 1.

Chapela also states that, "World food security depends on the availability of this diversity. Having it contaminated is something humanity should worry about."[99]

A rebuttal to these claims came in the form of a scathing editorial in the February issue of *Transgenic Research* and has been electronically navigating the globe via emails.[100] In the editorial, editor Paul Christou charged that Chapela and his co-author, Quist, had presented "no credible evidence to justify any of [their] conclusions."[101] This is the latest, and probably the greatest, scandal to rock the biotechnology industry. Regardless of which side in the gene wars is correct, one thing is clear: now that transgenic corn has been let loose in Mexico, stopping its spread is next to impossible.[102] Meanwhile, more than 144 farmer and other Civil Society Organizations (CSO) from 40 countries have signed a Joint Statement (released February 19) on the Mexican GM maize scandal.[103] The Joint Statement calls upon CIMMYT, the Food and Agricultural Organization (FAO), the Consultative Group on International Agricultural Research (CGIAR), academia, and private industry to conserve maize diversity and safeguard farmers.[104]

The Mexican GM maize scandal is an example of environmental and social violence. There was never a question as to "if" GM genes would end up in maize growing in Mexico; the only real question was "when" GM genes would be discovered in maize growing in Mexico.[105] In discussing the case of the Bhopal, India gas disaster, S.

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[99] Ibid. p. 1.
[100] Charles C. Mann. *Has GM Corn Invaded Mexico?* p. 1.
[101] Ibid. p. 1.
[102] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills*. p. 3.
[103] ETC group News Release. *Unnatural Rejection?: The academic squabble over Nature magazine's peer-reviewed article is anything but academic*. February 19, 2002, p. 1.
[104] Ibid. p. 3.
[105] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 2.

Ravi Rajan has explained how violent environments are the result of social phenomenon.[106] GM maize growing in remote hillsides of Southern Mexico can be described as technological violence or a "normal accident." A "normal accident" results when a mishap is a consequence of the characteristics of the system, predictable, and the result of a known cause.[107]

Altering the genetic makeup of DNA through the practice of biotechnology is fraught with uncertainty and risk due to the extremely complex technological processes and engineering systems that the science necessarily employs. A gene's behavior depends on its place in the genome, and therefore displaced DNA could be creating unpredictable effects.[108] The people living in Mexico were never warned about the inherent risks that GM corn poses to biodiversity. Many people believe that Mexican farmers bought GM corn to eat during a drought and then planted some of it without knowing it was transgenic.[109]

The Mexican government and the biotechnology corporations failed to communicate the risks of transgenic organisms to the Mexican people. This failure is illustrated by the case of Olga Toro from Capulalpam, Mexico; Toro purchased some corn kernels in 1997 at a low-cost feed store subsidized by the Mexican government.[110] What she didn't realize was that by sowing the seeds – probably imported from the United States – she was planting genetically modified corn unlawfully in Mexican soil.[111]

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[106] S. Ravi Rajan. *Toward a Metaphysic of Environmental Violence: The Case of the Bhopal Gas Disaster* in Violent Environments edited by Nancy Lee Peluso and Michael Watts (Ithaca and London: Cornell University Press, 2001) p. 380.
[107] Ibid. p. 381.
[108] Charles C. Mann. *Has GM Corn Invaded Mexico?* p. 2.
[109] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 4.
[110] Susan Ferriss. *Battle lines drawn in Mexico; Native corn to sacred to 'infect'?* p. 1.
[111] Ibid. p. 1.

Biotechnology corporations and the Mexican government have also failed to demonstrate any form of public accountability.[112] In a January 2002 interview with *Newsweek*, David Hoisington, Director of the Applied Biotechnology Center at CIMMYT, dismissed the negative impact of transgenic DNA in Mexico's traditional maize and tried to put the incident 'in perspective,' "Just the presence of one new gene is not going to destroy maize in Mexico…It's not a threat to biodiversity. It's just one gene among 50,000 to 60,000 genes."[113]

Another manifestation of a violent environment is known as corporate violence, or the violence of irresponsible capital and includes placing profit over the safety of people.[114] Genetically engineered food has not been proven safe to eat or grow; instead the burden of proof lies with the people questioning the safety of the science. While it is illegal to grow GM maize in Mexico, an average of 6 million tons of maize enters Mexico from the USA every year by truck and train.[115] Since there is no mandatory labeling of GM crops in the United States, these shipments contain unknown quantities of GM material.[116] GM maize could be growing in many locations throughout Mexico since Mexican migrants in the U.S. may have unknowingly smuggled GM corn into Mexico and then planted it in their community maize field (milpa). However, the theory that Mexicans have sabotaged their own fields by bringing GM corn seeds from the U.S. and

[112] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 3.
[113] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills* p. 3.
[114] S. Ravi Rajan. *Toward a Metaphysic of Environmental Violence: The Case of the Bhopal Gas* Disaster p. 384.
[115] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 4.
[116] Ibid. p. 4.

then planting them in their villages is a way of passing responsibility for the GM corn from the biotechnology firms onto the small farmers.[117]

In another example of corporate violence, the Mexican government and the biotechnology corporations have denied the validity of the work performed by Chapela and Quist, the two researchers from UC Berkeley.[118] Quist and Chapela's detractors, including many scientists, accuse them of exaggerating the dangers. The term "native corn" is a misnomer, they say, because farmers have been altering the genetic makeup of corn through selective breeding for thousands of years.[119] "We've got a lot of utopian idealists worried about contamination of the old corn varieties with the new. This is completely idiotic, the way it has been presented," says Norman Bourlag, a Nobel laureate and founder of CIMMYT.[120]

Some industry and industry-sponsored researchers insist that if the transgenic organisms do persist, they may actually prove advantageous for Mexican farmers and crop diversity![121] People from the pro-biotechnology camp have attempted to blame what they see as a "hysterical public" Dr. Val Giddings of the Biotechnology Industry Organization (BIO), a trade association, said the foreign DNA in the corn was not a threat to biodiversity because it would only help the strains survive.[122] Some proponents of biotechnology also go on to explain that genetically modified corn strains also help improve crop yields, lessening the need for acreage and slowing the conversion of wild

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[117] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills* p. 3.
[118] Charles C. Mann. *Has GM Corn Invaded Mexico?* p. 3.
[119] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills* p. 2.
[120] Ibid. pgs. 2 and 3.
[121] C.S. Prakash. *Scientists say Mexican Biodiversity is Safe: Concerns About Cross-Pollination Unfounded*. December 21, 2001, p. 1.
[122] Associated Press. *Biotech corn spreads in Mexico*. November 28, 2001. p. 2.

acres into farmland.[123] "Biotechnology is alleviating the threat on biodiversity by lessening the need for land… This argument [against GM corn] that has been advanced just doesn't hold water," Giddings said.[124]

For the Gene Giants to argue that there is no problem suggests that violating Mexico's sovereignty (i.e. its moratorium on transgenic planting material) and to insult the socio-cultural rights and concerns of Mexican farmers is of no concern.[125] In the words of Aldo Gonzalez, a farmer from Sierra Juarez de Oaxaca:

> "The contamination of our traditional maize exploits the fundamental autonomy of our indigenous and farming communities because we are not merely talking about our food supply: maize is a vital part of our cultural heritage. The statements made by some officials that contamination is not serious because it will 'increase our maize biodiversity,' are completely disrespectful and cynical."[126]

Some Mexican officials, including Victor Manuel Villalobos, Mexico's Undersecretary of Agriculture, seem to be attempting to dodge the role of protecting the safety of the people of Mexico and the diversity of maize by stating in an interview with *Newsweek* in January 2002 that "Mexico as a country cannot exclude itself from biotechnology. It is not an intelligent position to say that because there are risks we won't touch it."[127]

Distributive violence, or the violence of environmental injustice is applicable in the case of GM corn in Mexico. Mexicans are vulnerable to risks due to their economic

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[123] Ibid. p. 2.
[124] Ibid. p. 2.
[125] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 3.
[126] Translated from the Spanish, News Release issued by CSOs that organized a national workshop in Mexico City on World Food Day, "En defensa del maize y contra la contaminacion transgencia," October 16, 2001.
[127] Alan Zarembo. *The Tale of the Mystery Corn in Mexico's Hills* p. 2.

class because if Mexicans applied enough pressure to ban GM imports, then they would be faced with the reality of paying more money for non-GM corn. The economic damage stems from a bizarre irony: even though Mexico bans GM corn crops on its soil, a third of its imported U.S. corn is transgenic.[128] If public sentiment turns against GM corn, officials argue that having to import only non-GM corn would raise prices for consumers.[129] Without the financial ability to pay more for non-GM corn, consumers are forced to purchase GM corn along with the built in risks of the product.

During times of emergency, Rajan has identified a lack of effective regulation, a lack of transparency regarding risks, and the spread of panic as indications of bureaucratic violence.[130] In the case of GM corn contaminating Mexico, some Mexican academics seemed to prefer a "post-cautionary" principle, by insisting, peculiarly, that in the absence of knowledge about how transgenic organisms will behave in nature, scientists should operate on the assumption that they will do no harm.[131] Scientists who are optimistic about contamination argue that GM traits are just "more diversity" contributing to the millennium-long ebb and flow of old and new genes that crisscross species and environments.[132] This assumption demonstrates a lack of transparency regarding the risks of GM crops to the ecological environment and to the socio-cultural heritage of the affected communities. The announcement of contamination provoked an

[128] Ibid. p. 2.
[129] Ibid. p. 2.
[130] S. Ravi Rajan. *Toward a Metaphysic of Environmental Violence: The Case of the Bhopal Gas* Disaster pgs. 391 – 393.
[131] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas – Genetic Pollution in Mexico's Centre of Maize Diversity*. p. 2.
[132] Ibid. p. 3.

immediate crisis for local farmers and spread panic among the world's gene bank curators.[133]

The biotechnology industry has no moral problems with perpetrating social and environmental violence as demonstrated by the following remark made by an industry representative:

> "The hope of the industry is that over time the market is so flooded [with genetically modified organisms] that there's nothing you can do about it. You just sort of surrender."[134]

But You Promised

> A failure for citizens, a party for Big Business. It is time to end the NAFTA nightmare. NAFTA – and the model in which corporations are able to drag down labor, environmental and consumer standards by pitting countries against each other in a race to the bottom – must be scrapped.[135]
>
> - Russell Mokhiber and Robert Weissman

Mexico's agricultural sector is both complex and diverse. This sector can not support the weight of NAFTA, which has allowed imports of corn from enormous mechanized farms in the U.S. to flood the international market. When NAFTA opened up Mexico's border to mechanized corn a crisis emerged in Mexico, however GM corn is even more threatening to Mexico and the rest of the world, because the behavior of transgenic DNA in a center of mega-crop diversity over several generations is simply not known, and it is possible that CIMMYT, the world's most important storage facility for

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[133] Ibid. p. 2.
[134] Don Westfall. Quoted in the *Toronto Star* on January 9, 2001. Westfall is a biotechnology industry consultant, and vice-president of Promar International. http://www.promarinternational.com
[135] Russell Mokhiber and Robert Weissman. *NAFTAshock* in Corporate Predators: The Hunt for Mega-Profits and the Attack on Democracy. (Monroe, Maine: Common Courage Press, 1999) p. 176.

endangered maize seed diversity has already been contaminated by genetically modified corn.[136] There is no way that small farmers in Mexico can compete with the high-intensity, tariff-free corn available to consumers in Mexico. In contrast to the flat plains of the U.S., Mexican farms are much smaller, rainfall is less predictable, and the landscape is not suited for high-intensity agriculture.

Fertilizer, seeds, equipment, and credit are all more expensive in Mexico than in the U.S., not to mention that the North American logistical and transportation infrastructure is also superior.[137] Mexico's government once played a very supportive role to small farmers through subsidies as well as technical advice, however the government is no longer interested in creating opportunities for its' small farmers. Rather, policy makers are more interested in displacing small farmers, who must take up jobs in sectors such as labor-intensive, export-oriented vegetable production or manufacturing positions in maquiladoras, than helping farmers to increase their yields or substituting their crops.[138]

The failures of NAFTA are not only felt by small corn farmers and millers in Mexico, the failures are being felt by people all across the globe. NAFTA is being used as a model for similar treaties planning to transform regions into export-oriented industrialized zones across the global south to meet the needs of the consumer-based economies of the global north. The Free Trade Area of the Americas (FTAA) and Plan Puebla a Panama (PPP) have been designed to create a massive free trade zone stretching from Puebla, Mexico to Panama comprised of industrial parks with maquiladoras, luxury

[136] ETC group Communique. *Fear-Reviewed Science: Contaminated Corn and Tainted Tortillas*. p. 1.
[137] Robert Randolph. *For Better of Worse, NAFTA has Reshaped Mexico's Agricultural Sector* (Mexico City: Business Mexico, October 2001). p. 2.
[138] Ibid. p. 2.

hotels, more roads, and the creation of several "dry canals" through the Central American isthmus.

Proponents of NAFTA said that increased exports would create hundreds of thousands of new, good-paying jobs in the U.S. and at the same time the increased foreign investment in Mexico would raise Mexican living conditions. Side agreements were even attached to NAFTA to take care of labor and environmental issues, especially along the 2,000 mile U.S. / Mexico border, however these side agreements never received the funding needed to be effective. NAFTA's short-sighted planning is focused on the maximization of profits and this has only increased environmental degradation within Mexico and southern California. Imperial Beach in San Diego County is being polluted by the haphazard dumping of toxics into the Tijuana River, which then carries this toxic laden water across the border and through California, where it lingers in the Pacific Ocean. Knowing that untreated wastes from Tijuana and its 530 maquilas flush into the Pacific Ocean keeps many San Diegans from chancing a dip into their coastal waters.[139]

In addition to increased environmental problems, NAFTA has also increased social restructuring and fragmentation leading to problems such as rape and murder. All the social and environmental problems caused or increased by NAFTA have created an international spotlight on the border region. While this international spotlight is positive in many respects, it stands very little chance of creating effective policy changes because, among other things, there is now an international institution called the World Trade Organization (WTO) that acts as a global governing body which effectively strips local and national governments of their ability to enforce national labor and environmental

[139] Tom Barry with Beth Simms. The Challenge of Cross~Border Environmentalism: The U.S. – Mexico Case. (Albuquerque, NM: Resource Center Press and Bisbee, AZ: Border Ecology Project, 1994) p. 30.

laws. For example, laws that protect endangered species or increase the rights of laborers are usually seen as non-tariff barriers to trade, and thus local and national law is over-ruled by international law created in closed door sessions by the world's wealthiest countries.

International organizations such as the WTO are not created just by various governments. Corporations also play an enormous role in drafting the international laws and binding texts of the organizations. David Korten has outlined the ideal world of what he calls the global dreamers in his highly acclaimed book, When Corporations Rule the World. Global dreamers refers to the proponents of the free trade model based on corporate globalization. The ideal world of the global dreamers can be characterized as one in which:

- The world's money, technology, and markets are controlled and managed by gigantic global corporations;
- A common consumer culture unifies all people in a shared quest for material gratification;
- There is perfect global competition among workers and localities to offer their services to investors at the most advantageous terms;
- Corporations are free to act solely on the basis of profitability without regard to national or local consequences;
- Relationships, both individual and corporate, are defined entirely by the market; and
- There are no loyalties to place and community.[140]

All six of these points directly apply to the effects that structural adjustment such as the re-writing of Article 27 and the implementation of NAFTA have had, and continue to

[140] David Korten. When Corporations Rule the World. (West Hartford, Connecticut: Kumarian Press, 1995) p. 131.

have, on Mexican civil society in which the massive flooding of U.S. corn has greatly, and purposely, disrupted traditional Mexican agricultural production.

While NAFTA has made its contribution to soaring corporate profitability over the last eight years, it has degraded jobs, living standards, the environment, and democracy in the U.S. and Mexico, as well as Canada.[141] Many U.S. corporations have already made a dash to the U.S. / Mexico border to operate under the nearly non-existent labor and environmental regulations. Corporations that choose to remain in the U.S. constantly threaten to relocate to the border, other parts of Mexico, or similar zones of exploitation further away in South East Asia to manipulate and control workers, communities, and governments.[142]

This new millennium is a critical time in the struggle of resistance against capitalist accumulation, the mega-consolidation of the mainstream media, and corporate infiltration into all levels of policy decisions. We are witnessing commodification, deregulation, and privatization in the global political economy at an unprecedented speed. Global capital that can move instantaneously due to the computerized information age can bargain down virtually all parties, including nation state governments and their efforts to protect the rights and living standards of their citizens.[143] Sovereignty is almost non-existent today, meanwhile, self-reliance is seen as a threat to the model of capitalist accumulation and the tiny minority of extremely wealthy decision makers. It seems like the decision makers in the global north, through binding laws created and upheld through organizations such as the WTO, are using the world map to play a combination of the board games Monopoly and Risk. The goal of Monopoly is the ownership of all the

[141] Mokhiber and Weissman. *NAFTAshock* in Corporate Predators p. 174.
[142] Ibid. p. 175.
[143] *Mexico: The Slippery Slope: Poverty and Misery Aggravation by NAFTA*.

capital and the goal of Risk is for one color to conquer the entire world through military force.

It is unfortunate that technologies such as computers and the internet are facilitating increased rates of capitalist accumulation, but at the same time these technologies are becoming increasingly important to transnational networks of resistance. For example, the Zapatistas living in the Lacandon jungle of Southeastern Mexico surprised the world in 1994 by launching the website ezln.org even before technologically advanced peoples in the U.S. were communicating through email. The Zapatistas have sent communications accessible to people across the world through their website and various sources of decentralized, underground, and independent media.[144]

Zapatistas have raised the awareness of people all over the world that the consumer culture of the Global North has very serious and immediate repercussions on the cultures of the Global South. Indigenous communities have been forced to migrate from their traditional lands. This migration often causes people to move further into the forests, higher up on mountains, or into over-populated urban areas. Cultures with deep-rooted traditions are becoming increasingly fragmented everyday in the migration process.

Maize and cultural diversity are very similar in this respect. The same global institutions that have directly and indirectly caused the erosion of maize diversity have also caused the erosion of cultural diversity. The diversity of maize and the diversity of cultures are both critical for a healthy global society. As we struggle to preserve Earth's remaining plant, animal, and cultural diversity it is important we employ numerous methods of social and environmental change. There are no simple answers regarding the

[144] Zapatista. Video. (Santa Barbara, CA: Big Noise films, 1998).

best ways to create social change, therefore all the various methods enacted by people all over the world deserve both support and critical analysis.

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