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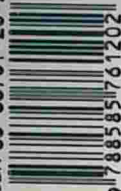
Initial concern for the environment, among Brazilian social scientists, was directed to the "brown agenda," seeking to identify the environmental components of an unjust society. The differential effects of environmental change on different social groups revealed the additional onus borne by the poor, in terms of health and quality of life. Unlike the experience of social science in rich countries, the "green agenda" and concern for the integrity of natural systems appeared later. The attention given to ecologically important regions emerged from a concern for the effects of both environmental degradation and of environmental preservation in the lives of traditional populations. This book is the first systematic effort to bring these concerns to bear on global change.



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Human Dimensions of Global Environmental Change

Brazilian Perspectives

Edited by:

Daniel Joseph Hogan
Maurício Tiomno Tolmasquim



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**SUSTAINABILITY:
A KEY CHALLENGE TO SCIENCE & TECHNOLOGY**


There is increasing scientific evidence that the major problems presently faced by humanity are caused and nourished by human action. Disarrayed population growth in various parts of the planet; degradation of agricultural and forest land; augment in the number of the endangered species; natural resource depletion; destruction of the ozone layer caused by greenhouse gas emissions; acid rain; global warming; alteration in the patterns of precipitation; sea level rise; environmental degradation caused by pollution; famine in ample parcels of the world population; extreme inequity in income and wealth distribution; social, cultural and ethnic conflicts... Hence, the roster is long and, more serious, alarming.

What the future holds in store for individuals and to humankind itself depends, to an extent, on the wisdom and use, destined by humanity, to science and technology. The development of science can provide humans with the knowledge of the biophysical environment and of social behavior needed to develop effective solutions to its global problems; without that knowledge, progress toward a safe world will be unnecessarily handicapped.

It is a major challenge to the international scientific community to contribute to the overcoming of the distresses presently afflicting societies, especially in developing countries. Without the continuous development and creative use of new technologies, society may limit its capacity for survival and for working toward a world in which the human species is at peace with itself and its environment.

As a result of planning and organizing the Open Meeting of the Human Dimensions of Global Environmental Change Research Community, held in Rio de Janeiro on October of 2001, the Board of the Brazilian Academy of Sciences

decided to invite Brazilian scientists to present position papers on subjects concerned with transition to sustainability in the new millennium. This book represents a contribution of Brazilian science to the debates of the international scientific community on the quest for sustainability. I hope you enjoy your reading.



Eduardo Moacyr Krieger
President of the Brazilian Academy of Sciences

PREFACE

The initiative of the Brazilian Academy of Sciences, in creating the National Committee on the Human Dimensions of Global Environmental Change, exemplifies the importance of leadership in furthering certain academic themes. Environmental studies have developed slowly within Brazilian social sciences and do not yet constitute a major area of concern. *Global* environmental change, in this context, has not been a priority, not even for researchers in the environmental area. These researchers were much more concerned – and continue to be so – with determinants and consequences of environmental change at the local (Brazilian) level. The gravity of the degradation of urban environments, pressure on natural resources and a limited tradition of public policies in the environmental area justify this emphasis.

Initial concern was directed to the "brown agenda," seeking to identify the environmental components of an unjust society. The differential effects of environmental change on different social groups revealed the additional onus borne by the poor, in terms of health and quality of life. Unlike the experience of social science in rich countries, the "green agenda" and concern for the integrity of natural systems appeared later. The attention given to ecologically important regions emerged from a concern for the effects of both environmental degradation and of environmental preservation in the lives of traditional populations. Today, Brazilian social sciences contemplate the full range of environmental problems.

In the last decade (with a lag in comparison to rich countries), the several disciplines of the social sciences have considerably expanded their research and teaching in the environmental area. This can be seen, for example, in the establishment of working groups on the environment within professional associations and the number of seminars dedicated to this topic. It is also seen in the creation of areas of concentration within traditional graduate programs and the

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Global Food Risks: Environmental and Health Concerns in Brazil

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INTRODUCTION

One of the dimensions of global environmental change is related to the food system. This does not refer only to production and its environmental consequences (water and soil pollution, declining soil fertility, water scarcity, for example), but obviously to the effects on consumers' and producers' health. Environmental and health food risks are global because the modern food system involves international trade, with more integrated international markets, and also because their effect on health and the environment is not restricted to national boundaries or poverty pockets. Pesticides, for example, through the circle of poison, may affect populations that consume imported food harvested with illegal pesticides (Guivant, 1992, 1995, 2000a). Other characteristics of modern food risks are that they can be invisible and irreversible (as in the case of DDT, whose effects were discovered much after commercial use began).

The recent highly publicized debates on food-borne diseases, especially Bovine Spongiform Encephalopathy (BSE) and its links with new variants of the Creutzfeldt-Jacob Disease (CJD) in humans and the onset of genetically modified (GM) organisms in the food system, have deepened public concern about how food is produced on farms and in factories, processed, transported, stored and traded. More importantly, they have launched a crisis related to central social issues, such as the roles of science, politics and business corporations in the decision processes for determining which risks societies should or wish to assume. So far, consequences of these debates include governmental and ministerial destabilization, discredit of scientists, threats to international trade relations, and demand for public debates about how to regulate uncertain, open-ended and indeterminate technological risks. Also, public interest groups are attempting to influence the pace and trajectory of the globalization process itself (Tait and Bruce, 2001). This is the scenario of a global risk conflict.

This crisis was anticipated by German sociologist Ulrich Beck, who over ten years ago transformed the field of risk analysis when he introduced the distinctive concept of "risk society" in his 1986 book (translated into English in 1992),

to refer to the radicalization phase of the principles of modernity. "Risk society" is a term for contemporary or late modern societies which, contrary to the industrial and class society of early modernity, face environmental and human health risks that are not simply side effects of technological progress, but central and constituent components of these societies. Moreover, the risks are structurally different in terms of their sources because they threaten every life form on the planet. Humanity has always been faced with risks, but the current ones are specifically unique because they are consequences of a certain type of science and technology development, and they have open-ended consequences. These risks have invisible global effects - regardless of class or nationality distinctions - which can be fatally irreversible once they are identified. Examples of these risks are global warming, pollution of water sources, food contamination, AIDS, the ozone layer hole, desertification, eco-toxicity, and radioactivity, with short- and long-term effects on people, animals and plants.

Much social research on manufactured risks focuses on the situation of highly industrialized countries.¹ Particularly for Beck, they are risk societies because they are going through a process of reflexive modernization where there is a growing realization (reflexivity) of the dangers involved in modernity and a consequent questioning of the main structures of society through new forms of doing politics. Another type of reflexive modernization characterizes a previous stage of modernity, where risks are produced but not yet the subject of sustained public or personal debate or political conflict.

If global risk society theory can demonstrate how risks with serious consequences are central to understanding highly modern society, now, with the global dimension that food-borne risks have assumed, this theory can prove its heuristic value (Guivant, 1998). In this article I will argue for the need to develop a more complex perspective on the global dynamics of food-borne risks and how the Brazilian debates around manufactured global food risks, such as BSE and GMs, can contribute to this objective. A significant bibliographical production has emphasized how food production is a key issue of environmental security, one of the components of global environmental change (related to food supply and national sovereignty). Here I will consider how food safety is also central for the discussion of global environmental change. Its analysis, although still very marginal in Brazilian academic and policy debates, can contribute for a better understanding of the new characteristics of the global food system and also of the specificities of global challenges for more and less industrialized countries in

terms of the food policy research agenda in safety standards. Brazil is already affected by the increased concerns in highly industrialized countries on food safety issues. Pinstrup-Andersen (2000) identified two major consequences of this process for less industrialized countries that can be applied to Brazil. First, exports of food commodities will be exposed to new and more demanding food safety standards, partly included in changes of the Codex Alimentarius and partly through unilateral demands by importers. Second, the influence on consumers in less industrialized countries of the changing attitudes and new legislation for food safety in highly industrialized countries.

In the first section I briefly introduced world risk society theory. In the following sections, I analyze the character of the coalitions organized around GMs and BSE in Brazil and how the heterogeneous social actors involved interpret those risks. To understand the peculiar coalitions and meanings of global food risks in Brazil it is necessary to consider them in a broad perspective that includes a reference to the progressive awareness of consumer rights and the growing food safety control that coexists with a significant amount of ignorance in relation to food-borne risks. In the last section, I will examine how little discussion has been raised about global food risks and their implications for the population's quality of life in the academic context of social sciences in Brazil. Moreover, we will discuss the relevance of this analysis for suggesting a research agenda.

POLITICS AND SUBPOLITICS IN A WORLD RISK SOCIETY

Given the global nature of risks, surpassing class and national borders, Beck argues that this new type of society can no longer be explained as a class society. If in the past hunger was hierarchical, now pollution is democratic. If before risks were seen as personal, now they are global: "food chains connect practically everyone on earth to everyone else" (Beck, 1992: 36). It results in a boomerang effect, since risk society is a **global** risk society, and it is not easy to escape. Consumers who are more informed and who have higher incomes might be able to avoid eating vegetables with higher amounts of pesticides, for example, but complete protection from risks would only be possible if one did not eat, drink or breathe. With this argument, Beck does not deny that some people are more affected by the risks than others, and he recognizes that the distribution parallels class inequalities and positions on the social scale, but with a different distribution logic.

Scientific knowledge, according to Beck, has caused two serious problems related to risks. One is linked to how "side effects" of a chemical substance are determined. The second problem relates to the fact that risks emerge not only as "accidents," "side effects" or because of improper use of technology. They are submersed and masked in the "levels of acceptability" of contamination that are defined through laboratory research standards, and thus unreal when expressed in formulas that do not reflect the multiplicity of chemical bombardment we suffer daily. Science, by stipulating these acceptable levels of contamination, is issuing a type of *carte blanche* for polluting and poisoning the environment. Yet the criteria of acceptability for residues and exposure are not fixed or definite. Often, what was said to be harmless to human health is later found to be harmful, through new evidence resulting from long-term research.

Beck's main criticisms of technical methods of risk analysis can be summarized as follows (Mol e Spaargaren, 1993): 1) limited method range, since not all substances can be evaluated for their risk potential, and neither can the effects of the combinations in our bodies and in the environment; 2) they do not consider cumulative long-term effects; 3) they project results for humans that were obtained with animals in a controversial manner and; 4) they ignore the social factors that may influence the peculiarities of individuals' sensitivities.

In regard to globalization, Beck (1997, 1999, 2000) has emphasized that the contribution of his theory of global risk society would be to demonstrate not only that there is a synchronism between class societies and risk society, but that both Western and non-Western societies can simultaneously face the same challenges of high modernity. He believes there is a plurality of modernities in the global risk society, in which non-Western and Western societies share the same challenges of second modernity, through different cultural perceptions.

However, it is surprising how Beck maintains an impoverished view of globalization, by considering the maximum difference within its synchronism to be the one between Western and non-Western societies, and ignoring the different types of Western and non-Western societies and the internal differences within countries (Guivant, 2000b,c). Poor countries are not found exclusively in non-Western societies. Neither are poor regions far from highly industrialized countries. By only referring to the latter countries, Beck disregards the complexities of possible combinations within the block of Western countries. An isolated reference to this problem is mentioned by Buttel (2000), but it is also absent from the various criticisms that Beck and his theories have received recently (see, for

example, Adam, Beck and Van Loon, 2000; Spaargaren, Mol and Buttel, 2000).

Another characteristic of risk society is that it leads to a redefinition of the social actors and arena for conducting politics (Beck, 1994, 1995). What once belonged to a private realm of responsibility and scientific creativity, has become a subject of debate for what Beck terms subpolitics (in the sense of political subsystems). Subpolitics distinguishes itself from politics (in the sense of the official political system) by involving actors who are outside the latter sphere (professional and occupational groups, technical intelligentsia of companies, research and management institutes, qualified workers, etc.) and who begin to participate in the public debate on various topics. Since there are limits for determining the standards of potential risks exclusively through scientific knowledge, the rules and bases for making such decisions should be reestablished: opening the dialogue and the decision process, recognizing that there is an inevitable openness of risk problems and solutions (Beck, 1994).

How are subpolitics implemented? How can risks be controlled? An alternative would be to set up negotiation forums with government authorities and corporations as well as unions, political representatives and other entities or individuals. These forums would not necessarily seek consensus, but would enable the parties to take precautionary and preventive measures, integrate doubts, define winners and losers, make the issue public, and thus finally, improve the pre-conditions for political action. These negotiating forums are not necessarily "consensus producing machines with guaranteed success," or do they eliminate conflicts or out-of-control industrial dangers. But they can contribute to the prevention of risks, guarantee a symmetry of sacrifices that can not be avoided and make it clearer as to who are the winners and the losers. Risk society's typical science, working behind closed doors, must be replaced by another science, which paradoxically would be more rational than the former. Beck is distant from the discourse of post-modernity or from recognizing any possibility of defending irrationality.

Research carried out recently in the EU in response to the challenges presented by BSE and GMs is, in part, greatly synchronized with Beck's proposed de-monopolization of the decision-making process. But this research has advanced significantly more than Beck in the formulation of more viable, yet not always easily implemented, strategies (Grove-White et al, 1997, 2000; Green Alliance, 2000; Stirling and Grove-White, 1999; Adam, 1998). The research is partially a product of the criticism of the way expert systems dealt with BSE and GM risks and so it has developed from a consensus about the need to substi-

tute unidirectional information systems with more transparent and open ones, so that consumers receive information that helps them make choices and decisions. The biggest challenge pointed out in the research is the lack of recognition on behalf of information providers about how to deal with risks about which there are divergent opinions, ignorance or uncertainty among experts. The tendency to deny such situations, instead of calming the public, can foment its skepticism and lack of confidence in the expert systems, in addition to stimulating suspicions about the opacity of the techniques and the potentially irreversible and unknown side effects.

Another consensual recommendation from the research cited above is that a participatory decision-making system is required in order to build legitimacy into the political decisions on food-borne risks. This can imply difficult challenges for politicians and scientific experts, as well as the need to accept imperfect decision-making and open learning processes: "there are no easy answers in the face of profound uncertainty" (ESRC Global Environmental Change Program, 1999).

In the following sections we will argue how the theory of world risk society can contribute to the analysis of the Brazilian debate on GMs/BSE and how this analysis can help to overcome the limits of a largely European focus.

UNCONVENTIONAL DISCURSIVE COALITIONS IN RESPONSE TO GMS

GM crops and food involve two types of uncertainty: how will they affect the natural life around them? And what will food from such plants do to humans when they become part of the standard diet? In regard to these two questions there are not any simple and definitive answers: "there could be hundreds of GM foods, all from entirely different gene adjustments. Even if one of them is proved safe – after a lifetime of human consumption – what does that say about the others? And if a consumer does die after many years of consumption, how will anyone be sure it was the GM food, and not the crisps, the hot dogs, the beer or the cigarettes? Can resistant genes escape into wild plants? Probably. Will it happen on a massive scale? So far, the answer is probably not. Will the world eventually be over-run by superweeds? Who knows? The alternative scenario painted by environmentalists is that the effect of herbicide resistant crops will be to kill off all the weeds, and with them the birds and insects that depend on

them, turning farmland into sterile monocultures (Radford, 1999). The answers to these questions are part of the struggle between coalitions – on the one hand, there are those who consider the uncertainties to be unfounded and irrelevant, and on the other those who prefer to assume an attitude of precaution.

The debate about GMs in Brazil began receiving media attention in September, 1998, when a report by the National Bio-Safety Techniques Commission (CTNBio) was challenged. This agency was created by the State within the Ministry of Science and Technology to regulate and study companies' requests to test and plant crops on Brazilian soil. It was initially comprised of scientists, representatives from interested companies and consumer organization representatives – who later withdrew from the commission due to disagreements over its operation. The disputed report was favorable to the first request (presented by Monsanto) for large-scale planting of genetically modified soybeans intended for commercialization, pending later approval by the Ministries of Health and the Environment. Reaction against this report was basically led by the Institute for the Defense of Consumers' Rights (IDEC) and by Greenpeace (as part of its international campaign), who initiated a public civil action suit against the government and Monsanto. The judge of the 6th District Court of Federal Justice in Brasilia sided with the plaintiffs and, with this decision, the government will have to elaborate safety and labeling norms so that in the future it can evaluate, and eventually authorize, the cultivation and commercialization of these foods (Leite, 2000; Gorgen, 2000).

The movement against the liberation of GMs was joined by other NGOs and political parties, such as the Workers Party (*Partido dos Trabalhadores* - PT), the Landless Workers Movement (*Movimento dos Trabalhadores Sem Terra* - MST), the Brazilian Society for the Progress of Science (SBPC), the Federal Prosecutor's Office, the Brazilian Institute of the Environment and Renewable Resources (IBAMA), and state Programs for the Defense of Consumer Rights (PROCON). These social groups and state agencies began to voice their concerns through the media, promoting debates, writing manifestos, and taking similar actions to publicize the lack of information about the risks involved and effectively press authorities to be cautious before approving any release of GMs (<http://www.consumidores.org.br>).

A new coalition of heterogeneous social actors is creating a space of supolitics against GMs. Although subpolitics refers to politics outside and beyond the representative institutions of the political system of nation-states, it can put unconventional political actors and discourses together in *ad hoc* 'coalitions of opposites'

with more conventional political actors (political parties, governments, unions, etc). This mix is also considered by Hajer (1995) in his characterization of the unconventional discourse coalitions in environmental issues: they are unconventional because they are constituted by a heterogeneity of social actors, such as scientists, politicians, activists, or consumer organizations, who do not necessarily share the carefully planned action strategies. However, as Hajer explains (1995: 13), "although these actors might share a specific set of story-lines, they might nevertheless interpret the meaning of these story-lines rather differently and might each have their own particular interests." The same risks assume different meanings for different social actors, as Douglas and Wildavsky (1982) had already pointed out. Unconventional discursive coalitions assume their own characteristics in Brazil, mainly in sectors that oppose the liberation of GM crops.

Within Brazil's unconventional discursive coalition against GMs we find "conventional" social actors such as PT and MST, who incorporate the GM theme within their classicist discourse against globalization, imperialism, multinational corporations, the USA, the International Monetary Fund, etc. The charges against GM crops are justified through economic and political arguments: who benefits and who suffers? How can we defend the survival of small rural producers and squatters against globalization and social exclusion markets? (Federal Senate/PT, 1999) The battle against GMs is presented by the MST leaders as an element within the fight against the government's agricultural policies, against the agricultural model and in the last instance, against capitalist society (Stedlie's declarations, *O Estado de S. Paulo*, June 1, 2000). But within the "conventional" discourse new issues are also integrated, mainly the environmental and health consequences of GMs. Environmental issues are more and more present in recent MST documents, although with marginal concern on issues like pesticide contamination.

Among these actors' actions are, in July of 2000 in Recife (Pernambuco), the invasion of a ship loaded with GM corn, several incidents of destruction of clandestine and trial fields of genetically modified crops of soybeans and manifestations in front of supermarkets and McDonald's, considered to be representatives of "imperialism" and the power of multinational corporations.² It is argued that the use of GM seeds encourages dependence by farmers on a single seed supplier and may involve the purchase of both the seed and herbicide from one supplier. The farmer can then be at the mercy of the seed company who may vary prices of both seed and herbicide at will.

The group of actors who assume a less conventional discourse includes international NGOs such as Greenpeace and organizations that represent consumers, such as PROCONs, IDEC and federal public prosecutors. IDEC and Greenpeace are part of the Brazil Free From Genetically Modified Products Campaign, which groups various NGOs and are part of an international coalition including powerful actors of a globalization from below, that pressure the activity of world corporations and national governments (Beck, 1999:38). Their intervention is centered on legal actions, with the objective of redefining CTNbio duties and decisions, advocating labeling and employment of the precautionary principle.³ Tests are also performed on food products to detect the presence of GM elements (*Revista Consumidor S.A.*, 47, February 2000) and consumer awareness campaigns are carried out. Arguments are focused primarily on health and environmental risks and on defense of consumer rights, a category significantly absent from the discourse of PT and MST. Among those who are directly allied to this group are governmental agencies such as IBAMA, and scientists who focus mainly on the level of uncertainty surrounding GM product risks and who also recommend applying the precautionary principle. Several manifestations of the Brazilian Society for the Progress of Science are oriented in this direction (Pavan, 1999).

The criticisms raised against GMs by these unconventional groups, parallel to the criticisms presented internationally by equivalent groups, point out the limits affecting the trustworthiness of conclusions obtained through scientific methods that tend to deny uncertainty and indeterminacy.

The model of society presumed in these groups, different from the model assumed by MST and PT, is about organizing actions that guarantee the strengthening of civil society, with special attention to the rights of the population as consumer citizens. It does not propose a model of society other than the capitalistic one, but something closer to the idea of ecological modernization (Mol and Spaargaren, 1993). Although IDEC's discourse clearly recognizes the precarious situation of consumer rights, when the Institute argues in favor of GM labeling, it may be putting this idea aside. The efficiency of labeling is important for a minority of persons with food allergies, for example, but in general it should be evaluated in the specific context of Brazilian consumers, who are fairly inactive in terms of reading food labels.⁴

This part of the coalition does not intend to assume an irrational or anti-scientific position regarding scientific knowledge. This becomes clear in its defense of the precautionary principle, which presumes, to a certain extent paradoxically,

that in the future we might possibly be able to obtain precise and definitive scientific knowledge regarding risks (Latour, 2000). However, food risks related to BSE and GMs might require the challenge of generating strategies to deal with technologies and productive processes that involve an uncertainty that is constant and not necessarily surmountable. Yet this issue is not significantly considered. Science in general is questioned as to its limits in evaluating GM environmental and health risks and the government is criticized because of its narrow approach to the decision-making process, responding directly to the needs of the biotechnology companies. There is no extensive criticism of how expert systems in Brazil deal and advise governmental agencies on how to deal with other food-borne risks.

In the coalition in favor of GMs we find scientists – who defend CTNbio criteria and decisions – and representatives of biotechnology companies such as Monsanto. They present a conventional scientific argument, defining the opposing sectors as irrational and uninformed catastrophists who are against progress. They even reverse the “imperialist” charge they receive from others back onto GM critics, arguing that the latter group is in fact the imperialist one, for impeding the distribution of seeds which could reduce hunger in less industrialized countries. The CTNbio scientists also assume an environmental argument, just as scientists from other countries, by stating that the use of GM crops significantly reduces the use of pesticides (<http://www.ctnbio.gov.br>) and can be the key to richer wildlife and efficient food production.⁵

This coalition's discourse does not hedge towards the view that standard decision-making tools, which are based on quantitative procedures and objectives, fail to capture the level of uncertainty and indetermination in relation to the effects caused by the new agricultural technologies, and neither does it recognize that environmental and health problems and their solutions are often complex and value-laden. That is, there is a resistance to recognizing the inevitability that risk analyses are permeated with “wider tacit political and institutional contingencies and commitments” (Grove-White, 1999), in this manner maintaining the presumption of a model of society where the role and contribution of science should not be publicly questioned.

Among rural producers there is a certain division between those who recognize themselves as beneficiaries of the GM crop prohibition and those who do not see the benefits and who, despite the sentence of up to three years in prison for infractors, prefer to import seeds clandestinely from Argentina, where

GM use is approved. Although there is no precise data available, some estimates suggest that in states such as Rio Grande do Sul, despite its policy of tight control over GM use, 30% of the area planted consists of GM soybean crops (Veja, March 28, 2001; *Consumidor S.A.*, N. 47, February, 2000). This use would be justified as an attempt to reduce pesticide expenses and to increase profits.⁶

Farmers who continue harvesting conventional crops are discovering a segmented market in their favor. The European food industry, supermarkets and processing companies, in response to consumer demand for products without GM ingredients, are taking concrete actions that significantly affect tendencies in the international commodities market. For example, in January 2001, Tesco and Asda, two British supermarkets that control 42% of the grocery market and import more than one million tons a year of GM animal feed, announced that they would switch their imports from the United States to Brazil, and that they would no longer sell the meat or milk of any animal fed with genetically modified soy or corn. Brazilian soy exports to the EU have increased from 2.99 million tons in 1996 to 6.87 million in 1999.⁷ In turn, this change has caused United States soy exports to Europe to fall from 9.85 million to 6.75 million tons between 1995 and 1999, following concern about GM crops (*The Guardian*, January 27, 2001).

Conventional crop producers are not the only ones who benefit; producers who cater to the organic market are also expanding their business. For example, the French grains dealer Cabinet Boyer is setting up a facility in Brasilia in May of 2001. The goal is to export 45 thousand tons of pesticide-free grains to the EU, Japan and the United States (*Gazeta Mercantil*, March 29, 2001).

The sectors in favor and against GMs encompass lay people – including rural production sectors – as well as experts, but they apparently do not significantly mobilize consumers. Each one of these heterogeneous alliances articulates itself with others on an international scale, but without necessarily involving identification of themes other than GMs or presenting the same interpretation of risks. Concern for the environment and consumer health might be more central for European and United States anti-GM groups than for those in Brazil, but it is expressed by part of the unconventional discursive coalition. This is due less to the confidence crisis in the expert systems – as would be happening among European consumers (Global Environmental Change Programme, 1999; Adam, 1998) – and more to an advance of the demands for consumer rights in defining scientific/technological and economic policies.

On one hand, NGOs in the coalition do not raise larger questions about the

expert system in control of global food risks. On the other, we suggest that the expert systems in Brazil have a limited role in consumers' decisions, who are perhaps more guided by trust in the food companies and supermarkets. Next, we will consider in more detail the recent BSE crisis in Brazil.

THE DISCURSIVE COALITION IN RESPONSE TO MAD COW DISEASE

For twenty days in February 2001, Canada and then NAFTA embargoed Brazilian meat because of a suspicion of BSE contamination. Cattle raisers in southern Brazil had bought animals from England, Germany and France (which used British feed for their cows) between 1989 and 1990, after BSE infection in British cattle had been confirmed.

BSE started to noticeably affect British cattle in the mid-1980s (due to feed made from the carcasses of contaminated sheep), and its transmission to humans in the form of a variety of the Creutzfeldt-Jacob disease (CJD) was only recognized around ten years later. In the last few years, several EU countries that considered themselves to be BSE-free have identified cases that have generated consumer mistrust of the expert and political systems, causing serious economic damage. After almost a decade of denial, BSE is now being considered a serious risk to human health, since it is irreversible and lethal. However, there is a large amount of uncertainty about the mechanisms through which the disease passes from cows to humans: whether it can be passed along through vaccines containing animal by-products; whether it is contagious among humans; how much time it takes to manifest itself; which are the risk groups, etc. The current debates surrounding BSE affect governments and sanitary inspection sectors that had not considered taking adequate measures to protect the population, especially in countries that considered themselves to be disease-free but that soon suffered bouts of contamination. For these reasons, BSE requires rigorous cattle monitoring.

With NAFTA's claims, the quality of Brazil's system of animal sanitary control was under scrutiny, as the country could not immediately identify the destination of the cattle imported from England. With the embargo, Brazil's meat market, which has one of the biggest herds in the world – 160 million heads – was at stake. Brazilian GM-free grain producers, but mainly meat producers, would gain from the country's elimination of BSE risk.

NAFTA's position led to an alliance in Brazil among sectors that were in opposition regarding GM crops and on different sides of national political questions: PT, environmentalists, MST, the Brazilian Association of Meat Exporting Industries, diplomats, businessmen, the government, cattle raisers and packing house owners.⁹ In this case, the discursive coalition was based on nationalistic arguments that disagreed with NAFTA's possible foundations in regards to the Brazilian governmental control system over the imported cattle's destination.⁹

The most consensual interpretation seemed to be that Canada had decided to embargo Brazilian meat for political and economic reasons, related to the commercial crisis at the WTO between the two countries' aviation companies, Bombardier and Embraer. Despite the fact that governmental authorities denied that the cause was the delay in sending information about the imported cattle, during the crisis more rigorous rules were defined for animal sanitary control, including registration and tracking programs for imported animals.¹⁰

The nationalistic reaction consisted of various acts: threats of aggression towards the NAFTA technical mission (which arrived in Brazil to examine cow herds and inspect farms, laboratories, feed factories and packing houses), notes in the newspapers about the Brazilian meat the delegates ate, demonstrations opposing Canada's policy, barbecues held in front of the Canadian consulate in São Paulo, a declaration from the local government representatives of São José dos Campos – where Embraer's factory is located – stating that Canada's prime minister is *persona non grata* in the city, bar boycotts of Canadian beverages, delivery of a cow to the embassy in Brasília, the refusal of port workers in Santos to unload Canadian ships, stereotypical Canadian jokes published in the media, etc.

This conjunctive coalition presents the same criticism of globalization as a phenomenon contrary to national sovereignty as is assumed in the discourse of part of the coalition against GMs. However, there is one important difference. In relation to the BSE crisis there was a large degree of unification against more industrialized countries, and the division between government and political oppositions was attenuated.

Who was left out of the coalition? IDEC, Greenpeace and other NGOs that work together in the GM alliance were not very present in the debate. If we look in the newspapers of that period, only a few critical commentators voiced their opinion on the Brazilian reaction. Pedro de Camargo Neto, president of the Cattle-raising Development Fund (Fundepéc), interpreted the crisis to be a warning against the lack of Brazilian concern for internal consumers and the belated

attention to the disease's risks (*O Estado de S. Paulo*, February 21, 2001). Larger questions were raised by Pedro de Felícia, a professor in the department of technology at Unicamp (Universidade de Campinas) and president of the Brazilian Association of Meat Sciences, and researcher Maristela Pituco, from the Biological Institute of São Paulo (*Folha de S. Paulo*, February 20, 2001). Both of them questioned the inversion of values inherent in the debate, which had a heavy emphasis on the economic aspect of the government's and society's positions, while ignoring the situation of internal consumers, threatened with diseases that attack cattle (rabies, leptospirosis, among others) and compromise meat consumed in the country. One of the risk management proposals that researchers suggest is the creation of a Food Ministry which would substitute the Agriculture Ministry and could enter into agreement with states to regulate demands such as animal prophylaxis and food inspection.

But this criticism of the internal management of food-borne risks was not pronounced publicly by the main social actors, as if the GM and BSE debates had no connection. It seems that the GM debate generated a reduced space for the discussion of risks of serious consequences in Brazil. So, consumer rights are gently and slowly being legitimized while the nationalistic discourse against commercial consequences of globalization is still strongly defended. Food risks were "translated" to the Brazilian situation through conventional political codes, as if any suspicion of the food safety system were impossible.¹¹

Through this discussion of the Brazilian reaction to BSE accusations I tried to address how the GM debate has involved little questioning of the food safety system. New technological risks are perhaps strengthening conventional political categories (North against South, left against right, nationalism against globalization, etc.), while consumer organizations are becoming important social actors in the decision process, as part of a struggle in the process of defining consumers as citizens.

WHERE ARE CONSUMERS AND ENVIRONMENTAL GLOBAL RISKS?

In Brazil few food panics have been registered (Guivant, 1995, 2000). But this does not imply, obviously, that risks do not exist because the systems that attempt to guarantee food safety are more efficient, but because there are no technical resources or sufficient workers to analyze and detect these risks (*Revista Amanhã*,

year XV, 158, September 2000). According to the daily newspaper *Folha de S. Paulo*, the Ministry of Agriculture recognizes the lack of any kind of inspection of 42% of beef, 19% of pork, 25% of chicken and 46% of dairy products produced in the country for immediate consumption or for production of food derivatives. Very little is known about the risks of pesticide residues in food (Guivant, 1995; 2000). The Federal Inspection Service (SIF) is the agency technically equipped to carry out inspections of foods of animal origin, but its inspection stamp is no guarantee of quality control, either. The inefficiency of inspection opens the possibilities for adulterated products, especially in industrially processed foods. From this year on, even this inefficient inspection will cease to exist, because the government has plans to create an agency to supply inspection services only for slaughterhouses, which pay for the service. Priority will be given to export products. For this reason, the purchase and sale of sick cattle, contaminated dairy products, falsification of sanitary inspection stamps, medieval looking cattle pens hidden on the outskirts of large cities (*Folha de S. Paulo*, 30/08/98) are but a few phenomena that escape inspection.

The food and environmental risks are part of a general picture that Port (2000) and Freitas (2000) termed "socio-political amplification of risks," that is, a generalized aggravation of risks to the population due to, among other factors, the lack of political, economic, technical-scientific and institutional infrastructure related to prevention and control of technological industrial risks. Faced with the generalized precariousness in food control and inspection, the consuming public is probably far from having an expectation of zero risk control, as the European consumer might have had in the pre-food scandal period. The attitude is perhaps one of resignation or indifference in view of the possible risks, together with the lack of knowledge of their dimension. Within this dimension we could discuss a reflexivity in the sense of reflection, with the risks of modernity being generated, but without becoming a public matter or the center of political conflicts.¹² It would still be valid to speak of "industrial society," which simultaneously produces and legitimizes the risks as residual (Beck, 1994:5).

Yet the vulnerability of the population regarding this precarious protection of its rights is slowly changing, and one of the consequences of the coalition initiatives for control over GMs may be an increase of the space for consumer citizenship. According to Sorj (2000: 53), consumer protection emerged in association with a combination of factors, among which he highlights the consolidation of a middle class with globalized consumption standards, establishment of a mass consumption

industry, strengthening of civil society and of citizenship rights. The advanced Consumer Rights Code, approved ten years ago mainly after pressure from organized groups such as IDEC, has become a decisive tool for consumer education.

The food-borne risks that have stimulated a more reflexive attitude among consumers in the last decade are those related to diets/health/body, increasing consumers' search for safety niches and refuge in control systems of the private sector (supermarkets, large food sector companies, and the growing offer of organic products). The body is being converted into a phenomenon of options and choices, in the sphere of biological reproduction, genetic engineering, and medical intervention. These transformations on the individual level are linked to global transformations, in a complex process of "nature's transmutation into a field of human action" (Giddens, 1991). This possibility and necessity of choice about our self-project (on the physical and psychic levels) is accompanied by a general disbelief in expert knowledge, which is always undergoing revisions and being debated. In order to make their decision, consumers must navigate through a sea of information that emerges from the means of communication, science, and local knowledge.

The manner in which expert systems take specific actions towards food-borne risks (pesticide use control, farmers' poisoning and contamination of food, water sources and soils) is apparently not a concern. This is quite different from Beck's characterization of the debates on food risks caused by pesticides and GMs as creating a trust crisis in criteria, rules, institutions and scientific production involved in guaranteeing safety of the foods consumed. Brazil has the problems of a scarcity society – in which the distribution of wealth between social classes is highly unequal – in conjunction with the problems of risk society (more than the ones affecting the food we consume), which does not rely on the same kind of reflexivity Beck identifies in more industrialized societies. This peculiar social hybridization affects not only Brazil, but also plays a role in the complex and multilinear dynamics of the globalization of risks. The type of reflexivity that may predominate in the middle and upper classes is not one that necessarily denies or ignores risks, but one that perceives a certain improvement in food risk control since the Consumer Code was approved. Without expectations of zero risk control, the current situation can be evaluated as positive, together with a feeling of impotence in relation to a still gray area of unknown risks.

TOWARDS A RESEARCH AGENDA

The issue of food-borne risks to internal consumers has not received special attention within rural sociology, which has tended to consider consumer rights and the question of quality of life to be secondary or non-problems. In some way, this is a reproduction of a general division of labor that seems to have dominated internationally the study of food. Tovey (1997) calls our attention to how the study of the organization of agriculture and its variable local forms have been the main concern of rural sociologists, as a separate area from the study of the sociology of food and its relations with consumption (eating, diet and culture) and not with production. In Brazil we can observe how social research on agricultural sustainability has assumed a predominantly agro-environmental productivist view (production methods and techniques with less or no use of pesticides, for example) and a socio-economic view (protection of family agriculture against agricultural modernization). This approach has contributed to criticism of the social and economic consequences of the Brazilian agricultural modernization process (for example, Ehlers, 1996; Almeida and Navarro, 1997), while not considering with the same emphasis health and quality of life questions for both the rural population and the population that consumes food/water with pesticide residuals. It is possible to identify, on an academic level, a reproduction of the principles and presuppositions of the alternative agricultural movements in Brazil, significantly influenced by early versions of Miguez Altieri's approach to agro-ecology (Guivant, 1997).¹³

There are recent case studies addressing health and environmental issues related to food production/consumption. But urban environmental policies still receive more interdisciplinary analysis than rural environmental policies or enforcement of those already existing. In part this is due to the objective limits in identifying and controlling agricultural pollution and also to the strong orientation in the academic community to avoid blaming family farming for environmental and health risks.

In relation to the global dynamics of the food system, integrating production and consumption, there is still limited debate (among the exceptions can be mentioned, for example, Wilkinson, 2000, and Cavalcanti, 1999). There are few studies about food safety (Sell, 1997); the preferred issue has been food security, especially interpreted as a question of national sovereignty in the context of globalization¹⁴ (for example, Menezes, 1998, Galeazzi, 1996).¹⁵ However, recently researchers who had studied primarily food security have also been

incorporating the issue of food safety (Maluf, 2000), with special attention to the question of consumer citizens.

For a tentative research agenda for studying these risks in Brazil, we can identify the following basic points about how diverse food-borne risks are managed and controlled. Some of the issues included would be: the arguments raised by each of the sectors active in debates on these risks, attempting to identify and trace the history, stages and characteristics of the specific debate and the causes that can be attributed to such characteristics. Questions related to these issues are: How are scientific, political and economic arguments articulated with arguments related to the population's quality of life and health? How does each sector represent the interest and arguments of the others?

Also crucial is the analysis of the challenges posed by food safety to policy research. Pinstrup-Andersen (2000) enumerates questions that can apply to the Brazilian debates: what policies and institutions will be needed to promote the required changes in food production, processing, and distribution to meet the new standards, while still being competitive in the export market? Will these policies and institutions be appropriate for the domestic food supply or should countries like Brazil have different standards? What are the implications of disagreements on food safety standards and environmental concerns between more and less industrialized countries and between poor and affluent population groups within Brazil, when different sectors have different acceptable risk levels? How will global changes in food safety criteria affect environmental and health risks in Brazil? What will the relations between food safety standards and food security be?

CONCLUSION

In this article I attempt to advance analysis of the specific ways in which global food-borne risks, such as BSE and GMs, are interpreted in Brazil. I argue that a heterogeneity of social actors with different "translations" of risk, generated from different models of society, is involved in the discourse coalitions constituted around these risks. Within the same alliance against GMs, for example, there are conventional political discourses, that give priority to class and national identities, coexisting with new discourses, oriented to the protection of consumers and the environment. In its turn, this national coalition is involved in a broader global alliance, where individual and collective social actors, both lay and experts,

may only share an antagonism to GMs without a common interpretation of their potential risks or the same appreciation of the range of issues in which GMs are incorporated as significant sources of risks.

In addition there was no significant questioning of the expert/governmental systems' role in food safety. The GM debate has been restricted to this specific issue, with no "contamination", or overflow, to other sources of risk in the food chain. Pesticides are still out of the scenario. The debate is centered mainly on how to control the marketing of GMs, and since it does not focus on alternatives, it ends up strengthening conventional crops, although organic production may also begin to be benefited by the limitation on GM markets. The debate, therefore, is more in terms of "opposition to" than "in favor of" alternative models. In the case of the BSE crisis, it was argued that instead of provoking a critical reflection on Brazil's food system, it generated a nationalistic response. This response reinforced diffuse beliefs in the quality of the food system instead of opening up a discussion on the vulnerability of consumer health and the sustainability of the rural environment through insufficient controls and lack of implementation of existing legislation.

Another characteristic of Brazilians' "translation" of global food risks is the marginal involvement of consumers in these debates. This can be attributed, via a complex causal articulation, to the absence of previous zero level control expectations with regard to risks. Brazil is a very dynamic society, characterized by improvements in the implementation of food safety procedures, the social construction of consumers as citizens, growing levels of consumption, the globalization of markets coexisting with a still very inefficient system for enforcing food safety controls. Instead of looking at food safety as a half empty glass, the middle and upper classes are seeing rather a half-full glass.

Analysis of the peculiar "translation" of these recent global food panics/risks in Brazil reveals the complexities of the discourse coalitions which have emerged, and point the way to the need for a more differentiated approach to the global dynamics of risk society and also for the formulation of a research agenda which will permit a more complex examination of Brazil's specific characteristics facing global environmental and health risks and also contribute to a more open discussion of how to deal with open-ended risks.

NOTES

1. The wide influence of Beck's ideas, not only in social sciences but in other fields and in the political sphere as well, can be gauged from the analyses of scholars from various fields: Franklin (1998), Adam et al (2000) and Spaargaren et al (2000).
2. McDonald's has already acted to remove GM in animal products.
3. The fact that product labels do not indicate the presence of GM products violates article 66 of the Consumer Defense Code, which stipulates a punishment and fine for whoever omits relevant information regarding the nature, characteristics, quality and quantity of a product.
4. According to Zancan (1999), labeling foods that are obtained from GM organisms is fundamental for the availability of epidemiological data on allergic reactions and other food intolerance reactions, about which the molecular mechanisms are unknown. The available US data estimate food allergy incidence in 1.5% of the adult population and 5% of children under three years of age.
5. This is also a very controversial issue. Crops which have been Genetically Modified to resist herbicides can encourage the use of larger quantities of herbicide, with the effect that both weeds and beneficial plants are killed indiscriminately. These herbicides are harmful to both the environment and to humans (29 March 2000, LA Times; 21 September 1999 Daily Mail UK; 8 July 1999, Times UK). GM plants may crossbreed with wild species to produce "super-weeds", which cannot be eliminated using standard herbicides.
6. The benefits of GM seeds for small rural producers is still a subject of international debate (Wilkinson and Castelli, 2000; Marsden, 1999). Divergencies in production strategies are also found in the United States, with sectors reviewing their past decisions in light of the resistance of European markets.
7. Soy is in about 60% of all processed foods, including biscuits, soft drinks, ready-made meals, bread, chocolate and baby food while corn is found in baby food, crisps, confectionery and a variety of snacks (The Guardian, March, 20, 2000).
8. The declarations of PT president José Dirceu in relation to the meat embargo illustrate the assumed nationalist position: "It had been many years since something of such importance, related to international politics, had happened in the country. In a few days, Canada accomplished what we could not in years in terms of the awareness of millions of Brazilians. It had never been so clear what globalization is and what its limits are. And mainly, Brazil's need to change its course and project itself as a sovereign nation." (Folha de S. Paulo, March 14, 2001). Environmentalist and Federal Representative Fernando Gabeira believed the crisis with Canada was a lesson to Brazilians on globalization and colonialism: "...on this question with Canada, we were condemned by our qualities... It is as if history arrives a year late, for this episode with mad cow disease is a starting point from which to review 500 years, and in a certain way, to re-situate ourselves in the world. Who knows? Maybe one day we will thank Canada for waking us up from an old colonial dream." (Folha de S. Paulo, February 19, 2001).

9. In some European countries it is also possible to observe the same nationalistic reaction against the implications of mad cow disease for meat producers. For example, the case of French agricultural producers who were against the import of Argentine meat in the beginning of 2001. However, this reaction has not led to an alliance between opposing camps in the GM crops question. (see Le Monde, January 29, 2001)

10. Since 1998, Canadian sanitation authorities have requested that Brazil present documents concerning the imported cattle, but have received no response.

11. We can draw a parallel between the nationalistic discourse in relation to BSE in Brazil and in European countries. When the British government started to receive criticism for how it was dealing with the disease, the question became a nationalistic test of confidence in British beef. The same took place in other European countries, such as France and Germany, that denied any possibility of infection in their cattle. Any criticism was considered to be anti-nationalist. However, while in European countries the nationalistic discourse was stronger before the GM crisis and the emergence of evidence of local infection and human contamination, in Brazil this discourse became stronger after the GM debate.

12. There is not enough data on Brazilian consumers' perception of risk. Internationally, the opposition to GM foods and crops is growing and now includes North America. The latest industry-funded polls show 59% of Canadians flatly opposed to GM foods, while 51% in the US say the same thing - with the overwhelming majority in both countries expressing mounting concern over the lack of safety-testing and labeling. In Europe up to 70% adamantly oppose GMs, while 82% of Japanese are opposed. In response, North American farmers are already starting to cut back on major GM crops - corn, soybeans, and canola. The latest July USDA estimates show a 20% drop in GM corn acreage and a 6% drop in soybeans, while Canada analysts predict a 10% reduction in GM canola (Biodemocracy News, n.28, www.purefood.com - site of the Organic Producers Association, from the USA).

13. Exposing this perspective, that excludes the issues mentioned above, Almeida (1998: 69) enumerates the principles of sustainable agriculture: "1) alternative agriculture determines a stricter and more balanced relationship between the natural environment and the one created by man; 2) it improves social, economic, ecological and cultural diversity; 3) it implies the creation and management of production systems that seek a greater personal involvement and more direct production, promoting greater autonomy in the productive realm; and 4) it leads to the building of a future in which individuals are free and can comprise a truly autonomous and democratic society."

14. Graziano da Silva (2000) illustrates this position by asking: "In the era of globalization, can a peripheral country such as ours implement a national food safety policy? Can we exercise our sovereignty by choosing our population's diet? Is it possible, in an open economy, to implement a policy of regulatory stocks which are supplied preferably by local production? Or should we simply import our food every time internal prices threaten to increase? In summary, can we eat what we want or must we follow the food standards imposed upon us in the

name of globalization and modernity? And who sets these standards? Is it the consumers of developed countries or the large transnational companies of the agricultural food system?"

15. According to the White Paper on Food Safety (2000), of the European Union, food safety includes primary food production (agricultural and veterinary aspects), industrial processes, storage, distribution and retailing, remitting to both risk and nutritional issues related to animal feed, animal health and welfare, hygiene, contaminants and residues, novel food, additives, flavorings, packaging and irradiation.

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